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National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people: Evidence base

Third edition

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We acknowledge the Traditional Custodians of the lands and seas on which we work and live, and pay our respects to Elders, past, present and future.

National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people: Evidence base

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Foreword

I am very pleased to release the third edition of the *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* (National Guide) for use throughout Australia. The first edition was instigated and led by the National Aboriginal Community Controlled Health Organisation (NACCHO) when it was published in 2005. Our aim was to help Australian health services overcome their uncertainty about screening and other preventive health interventions so that Aboriginal and Torres Strait Islander peoples could realise health benefits. The National Guide did not merely refer to biomedical interventions. We structured preventive interventions as five types, directing users to consider the social determinants of health, thereby making the guide unique.

This third edition continues that tradition and has new topics drawn from advice we received from Aboriginal Community Controlled Health Services and users of the National Guide. Our user survey resulted in 554 responses from general practitioners (GPs) and other healthcare providers across Australia. With this feedback, we were able to commission authors with expertise on topics such as child health and wellbeing and fetal alcohol spectrum disorder, as well as on other topics important to Aboriginal and Torres Strait Islander peoples. All the revised chapters were sent to external experts and relevant peak bodies across Australia. The support we have received in developing this National Guide has been phenomenal.

We are proud of the continued collaboration between NACCHO and The Royal Australian College of General Practitioners (RACGP) to create all editions. We thank the NACCHO and RACGP teams for their passion and expertise in making this resource as valuable as it is. We are also pleased that through the promotional efforts of the RACGP and the Australian College of Rural and Remote Medicine, many GPs in general practices across Australia are aware of and are using the National Guide to support their delivery of preventive healthcare to their Aboriginal and Torres Strait Islander patients.

NACCHO and the RACGP will support the implementation of the National Guide through social media platforms and implementation workshops across Australia. We also encourage private vendors of clinical information systems to consider and support ways in which the recommendations contained within the National Guide can be incorporated in their software.

We are thankful for the support of the many peak health bodies and experts that have helped guide this revision.

On behalf of the team and contributors, we hope this National Guide will help healthcare providers take opportunities to prevent disease and illness in all their Aboriginal and Torres Strait Islander patients throughout their lifespan.

Mr John Singer
Chair
NACCHO
February 2018

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Acknowledgements

This *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* is a collaborative effort of the National Aboriginal Community Controlled Health Organisation (NACCHO) and The Royal Australian College of General Practitioners (RACGP).

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Abbreviations and acronyms

7vPCV	7-valent pneumococcal conjugate vaccine
10vPCV	10-valent pneumococcal conjugate vaccine
13vPCV	13-valent pneumococcal conjugate vaccine
23vPPV	23-valent pneumococcal polysaccharide vaccine
AAP	American Academy of Pediatrics
AATSIHS	Australian Aboriginal and Torres Strait Islander Health Survey
ABPI	Ankle Brachial Pressure Index
ABS	Australian Bureau of Statistics
ACCHS	Aboriginal Community Controlled Health Service
ACE	angiotensin-converting enzyme
ACR	albumin–creatinine ratio
ADHD	attention deficit hyperactivity disorder
AF	atrial fibrillation
AHW	Aboriginal health worker
AIDS	acquired immune deficiency syndrome
AIHW	Australian Institute of Health and Welfare
AIR	Australian Immunisation Register
AMPs	alcohol management programs
ANU-ADRI	Australian National University Alzheimer's Disease Risk Index
AOM	acute otitis media
AOMwiP	acute otitis media with perforation
AOMwoP	acute otitis media without perforation
APGAR	Appearance, Pulse, Grimace, Activity, Respiration
APSGN	acute post-streptococcal glomerulonephritis
ARB	angiotensin II receptor blocker
ARF	acute rheumatic fever
ARIs	acute respiratory illnesses
ASD	autism spectrum disorder
ASHM	Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine
ASO	anti-streptolysin O
ATAGI	Australian Technical Advisory Group on Immunisation
ATSISPEP	Aboriginal and Torres Strait Islander Suicide Prevention Evaluation Project
AUDIT-C	Alcohol Use Disorders Identification Test
AUSDRISK	Australian Type 2 Diabetes Risk Assessment Tool

BBGS	Brief Bio-social Gambling Screen
BBV	blood-borne virus
BCG	Bacillus Calmette-Guerin
BMD	bone mineral density
BMI	body mass index
BOLD	Burden of Obstructive Lung Disease
BP	blood pressure
BV	bacterial vaginosis
CABG	coronary artery bypass graft
CAC	coronary artery calcification
CARI	Caring for Australasians with Renal Impairment
CARPA	Central Australian Rural Practitioners Association
CDC	Centers for Disease Control and Prevention
CDP	Community Development Programme
CFT	Children's Friendship Training
CKD	chronic kidney disease
CMV	cytomegalovirus
COAG	Council of Australian Governments
COPD	chronic obstructive pulmonary disease
CP NMDS	Child Protection National Minimum Data Set
CRAFFT	Car, Relax, Alone, Forget, Friends, Trouble (screening tool)
CRP	C-reactive protein
CSF	cerebrospinal fluid
CSLD	chronic suppurative lung disease
CSOM	chronic suppurative otitis media
CT	computed tomography
CVD	cardiovascular disease
DBP	diastolic blood pressure
DES	diethylstilbestrol
DME	diabetic macular oedema
DR	diabetic retinopathy
DRE	digital rectal examination
DSM-5	*Diagnostic and statistical manual of mental disorders*, 5th edition
dTpa	diphtheria/tetanus/pertussis
DXA	dual energy X-ray absorptiometry
ECG	electrocardiogram

eGFR	estimated glomerular filtration rate
EGM	electronic gaming machine
ENDS	electronic nicotine delivery systems
ENT	ear nose and throat
ESKD	end-stage kidney disease
ESR	erythrocyte sedimentation rate
ETS	environmental tobacco smoke
FAP	familial adenomatous polyposis
FAS	fetal alcohol syndrome
FASD	fetal alcohol spectrum disorder
FAV	family abuse and violence
FEV_1	forced expiratory volume in one second
FLAGS	Feedback, Listen, Advice, Goals, Strategy
FRAX	Fracture Risk Assessment Tool
FRE	Framingham Risk Equation
FTA-ABS	fluorescent treponemal antibody absorption
FTT	failure to thrive
FVC	forced vital capacity
GAS	Group A streptococcus
GBS	Group B streptococcus
GDM	gestational diabetes mellitus
GEM	growth and empowerment measure
GFR	glomerular filtration rate
GINA	Global Initiative for Asthma
GOLD	Global Initiative for Chronic Lung Disease
GP	general practitioner
GPCOG	general practitioner assessment of cognition
GPP	Good Practice Point
GTT	glucose tolerance test
HANAA	Here and Now Aboriginal Assessment
Hb	haemoglobin
HbA1c	glycosylated haemoglobin
HBcAb	hepatitis B core antibody
HBIG	hepatitis B immunoglobulin
HBsAb	hepatitis B surface antibody
HBsAg	hepatitis B virus surface antigen
HBV	hepatitis B virus

HCC	hepatocellular carcinoma
HCV	hepatitis C virus
HDL	high density lipoprotein
HEEADSSS	Home, Education/Employment, Eating, Activities, Drugs and alcohol, Sexuality, Suicide and depression, Safety
HITS	Hurt, Insult, Threaten, Scream
HIV	human immunodeficiency virus
HNPCC	hereditary non-polyposis colorectal cancer
HPV	human papillomavirus
HRCT	high-resolution computed tomography
HRT	hormone replacement therapy
hsCRP	high sensitivity C-reactive protein
HSIL	high-grade squamous intraepithelial lesion
ICD-10	International Classification of Diseases, 10th Revision
IDA	iron deficiency anaemia
IFG	impaired fasting glucose
iFOBT	immunochemical faecal occult blood test
IGT	impaired glucose tolerance
IPD	invasive pneumococcal disease
IRIS	Indigenous Risk Impact Screen
IUD	intrauterine device
K-10	Kessler Psychological Distress Scale
KICA	Kimberley Indigenous Cognitive Assessment
KMMS	Kimberley Mums Mood Scale
LARC	long-acting reversible contraception
LBC	liquid-based cytology
LBW	low birth weight
LVH	left ventricular hypertrophy
MBS	Medicare Benefits Schedule
MCUG	micturating cystourethogram
MMN	multiple micronutrient
MMSE	Mini Mental State Examination
MN	micronutrient
MRI	magnetic resonance imaging
MSM	men who have sex with men
MST	Multisystemic Therapy

NAAT	nucleic acid amplification test
NACCHO	National Aboriginal Community Controlled Health Organisation
NATSIHMS	National Aboriginal and Torres Strait Islander Health Measures Survey
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NCVSP	National Children's Vision Screening Project
NEHS	National Eye Health Survey
NHMRC	National Health and Medical Research Council
NI	neuraminidase inhibitor
NICE	National Institute for Health and Care Excellence
NIEHS	National Indigenous Eye Health Survey
NIP	National Immunisation Program
NIPS	National Immunisation Program Schedule
NIPT	non-invasive prenatal testing
NNH	number needed to harm
NNT	number needed to treat
NRT	nicotine replacement therapy
NTHi	non-typeable *H. influenzae*
NVDPA	National Vascular Disease Prevention Alliance
NZGG	New Zealand Guidelines Group
OAMT	opioid agonist maintenance treatment
OGTT	oral glucose tolerance test
OME	otitis media with effusion
OOHC	out of home care
OST	opioid substitution therapy
PBS	Pharmaceutical Benefits Scheme
PCHL	permanent congenital hearing loss
PCI	percutaneous coronary intervention
PCR	polymerase chain reaction
PCV	pneumococcal conjugate vaccine
PEP	post-exposure prophylaxis
pFAS	partial fetal alcohol syndrome
PGRTC	Problem Gambling Research and Treatment Centre
PGSI	problem gambling screening index
PHiD-CV10	10-valent pneumococcal *H. influenzae* protein D conjugated vaccine
PHQ-9	Patient Health Questionnaire
PIP	Practice Incentives Program

POCT	point-of-care testing
ppm	parts per million
PrEP	pre-exposure prophylaxis
PSA	prostate-specific antigen
QAAMS	Quality Assurance for Aboriginal and Torres Strait Islander Medical Services
QIV	quadrivalent vaccine
RACF	residents of aged care facilities
RACGP	The Royal Australian College of General Practitioners
RCT	randomised controlled trial
RHD	rheumatic heart disease
RIVUR	Randomized Intervention for Children with Vesicoureteral Reflux
s100	Section 100 scheme
s85	Section 85 scheme
SACS	Substances and Choices Scale
SBP	systolic blood pressure
SD	standard deviation
SEW	Social Emotional Wellbeing (assessment)
SIDS	sudden infant death syndrome
SIGN	Scottish Intercollegiate Guidelines Network
SSRI	selective serotonin reuptake inhibitor
STI	sexually transmitted infection
TGA	Therapeutic Goods Administration
TM	tympanic membrane
TPHA	Treponema pallidum haemagglutination assay
TT	tympanostomy tube
UK	United Kingdom
URTI	upper respiratory tract infection
US	United States
USPSTF	US Preventive Services Task Force
UTI	urinary tract infection
VE	vaccine effectiveness
VSA	volatile substance use
VUR	vesico-ureteric reflux
WHO	World Health Organization

Methodology

The review and updating of the second (2012) edition of the *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* (National Guide) was undertaken by the National Aboriginal Community Controlled Health Organisation (NACCHO) and The Royal Australian College of General Practitioners (RACGP) in 2016 and 2017. This project was funded by the federal Department of Health and was led by a project executive whose role was to coordinate all aspects of the project, including liaison with the funder, convening a project reference group, commissioning a clinical editor, commissioning authors to develop chapter drafts for specific topic areas, coordinating expert individual and organisational reviews, formatting and editing the final version, seeking endorsement and developing print and electronic strategies for dissemination. The role of the project reference group was to contribute to and clarify the overall scope of the National Guide, provide advice regarding its development, periodically appraise the content of draft chapters, and provide advice regarding its dissemination. The project reference group included representation from NACCHO, the RACGP, the Australian College of Rural and Remote Medicine (ACRRM) and selected Aboriginal Community Controlled Health Services (ACCHSs) and general practitioner (GP) representatives.

The development of this third edition comprised three stages:

1. review of the second edition of the National Guide
2. evidence review and formulation of recommendations
3. editorial review, expert review and stakeholder consultation.

Review of the second edition

A formal review of the second edition of the National Guide was conducted to determine current usage and how the structure, content and modes of dissemination could be improved. This comprised an online survey primarily involving GPs and Aboriginal and Torres Strait Islander health workers and practitioners seeking feedback and suggestions for improvements to the structure and content for the third edition. The online survey was distributed to all RACGP members via the RACGP e-newsletter and all NACCHO affiliates and member services via an email from the NACCHO chief executive officer.

Evidence review and formulation of recommendations

Defining the scope

The National Guide focuses on health issues that are preventable, amenable to primary healthcare intervention and contribute greatly to the morbidity and mortality of Aboriginal and Torres Strait Islander people. Existing topic areas from the second edition were reviewed by the project reference group and all were considered appropriate for inclusion in the second edition. The following new topics were also agreed upon:

- family abuse and violence
- preventing child maltreatment – supporting families to optimise child safety and wellbeing
- fetal alcohol spectrum disorder
- prevention and early detection of lung cancer
- expansion on antenatal care.

Preventive activities are typically classified as:[1]

- **Primary prevention**, which aims to avoid the development of a disease. Immunisation, brief interventions regarding disease risk factors, and population-based health promotion activities are examples of primary preventive measures.
- **Secondary prevention**, which focuses on early disease detection such as from screening, and implementation of interventions to prevent disease progression and emergence of symptoms.
- **Tertiary prevention**, which reduces the negative impact of an already established disease by restoring function and reducing disease-related complications.

The emphasis of this National Guide is on primary prevention and secondary prevention activities. Interventions were included if these were considered effective, feasible to implement and able to make a substantial contribution to reduction in overall disease burden. A pragmatic approach was taken for each topic area to determine which secondary prevention activities should be included. This was facilitated by regular communication between authors, editors, the project reference group and, at the later stages, expert reviewers.

Development of recommendations

Preventive interventions were:

- classified according to their type and assessed for their effectiveness based on critical review of established guidelines and empirical literature (refer to 'Critical appraisal and assigning the level and strength of evidence')
- assessed for whether the evidence base informing them was considered generalisable to an Aboriginal and Torres Strait Islander healthcare context
- assessed for whether they were feasible to implement in a primary healthcare setting.

Classification of preventive interventions

Interventions were classified into five categories to ensure a systematic and comprehensive approach to prevention.[2]

1. **Immunisation** involves the administration of vaccines to prevent the onset of infectious disease.
2. **Screening** involves the systematic detection and management of disease before symptoms develop. Screening is warranted when management of the disease in the preclinical phase confers benefits beyond those from when the person becomes symptomatic and seeks clinical help. Examples include screening for diabetes, cancer, osteoporosis and high cardiovascular risk.
3. **Behavioural** interventions involve any interventions that target the actions a person may take for the purpose of promoting or maintaining health (eg physical activity), or brief interventions, for example, to support smoking cessation or safe sex.
4. **Chemoprophylaxis** involves the use of medication to prevent the onset of disease or reduce the risk of acquiring disease: for example, use of angiotensin-converting enzyme inhibitors to prevent kidney disease; use of aspirin for the primary prevention of vascular events; use of antiviral drugs to prevent influenza.
5. **Environmental** influences include action related to social determinants, community and public health structural interventions that are considered relevant to primary care practitioners, either via direct implementation or via involvement in peripheral activities such as advocacy and liaison with other agencies. It also includes systems-based interventions conducted in the health service. Examples include community-based programs to ensure improved food supply, school-based interventions, implementation of a systematic recall and reminder system, advocacy to government stakeholders for local/regional liquor licencing regulations, involvement of the health service in social marketing activities.

Generalisability of recommendations to an Aboriginal and Torres Strait Islander health context

Factors considered valid for application in the Aboriginal and Torres Strait Islander health context included:

- differences in prevalence of disease/risk factors for Aboriginal and Torres Strait Islander populations that may influence the population benefits, cost effectiveness of the intervention and predictive value of screening tests
- whether socio-cultural factors might predicate a different approach
- whether the effectiveness of the intervention is known to exhibit wide variation depending on geographical region.

Specific evidence **against** generalising national and international recommendations to Aboriginal and Torres Strait Islander populations was necessary to determine if recommendations did not apply. Recommendations presupposing a genetic predisposition to disease were considered ungeneralisable due to the vast heterogeneity of Aboriginal and Torres Strait Islander populations. The consideration of individual predisposing risk factors such as family history was deemed relevant.

Relevance and applicability to primary healthcare

Preventive activities considered out of scope were those implemented outside the primary healthcare context. Examples include screening for tuberculosis, interventions to increase workforce participation and housing and education initiatives. However, primary care practitioners play an important role in advocating for these activities, and in this context recommendations to support an advocacy role were included. Other considerations influencing whether recommendations were suitable for primary healthcare included whether the information was useful for clinical decision making, particularly for areas where there is clinical practice uncertainty or where the issue is considered contentious or controversial.

Searching the evidence base and drafting recommendations

The evidence base for the National Guide was informed primarily by national and international evidence-based guidelines, and primary research evidence. Published guidelines from several national and international guideline developer groups were sourced. Where new Australian guidelines were being updated or newly developed, the guideline developers were contacted to review the most current drafts.

The following guideline developer groups/repositories were reviewed:

- Australian National Health and Medical Research Council (NHMRC) guidelines portal[3]
- UK National Institute for Health and Care Excellence (NICE)[4]
- New Zealand Guidelines Group (NZGG)[5]
- Scottish Intercollegiate Guidelines Network (SIGN)[6]
- US Preventive Services Task Force (USPSTF)[7]
- US Agency for Healthcare Research and Quality.[8]

Australian clinical practice guidelines developed by non-government organisations were also reviewed. Examples included the RACGP *Guidelines for preventive activities in general practice* (Red Book),[9] the Central Australian Rural Practitioners Association *CARPA standard treatment manual*,[10] Queensland Government *Primary clinical care manual* [11] and *Chronic conditions manual*,[12] and the *Therapeutic guidelines.*[13]

Where existing or newly developed guidelines were considered insufficient for particular topic areas, systematic reviews and meta-analyses of the primary research literature were then reviewed. In the absence of these studies, or where the scope was considered insufficient, authors were instructed to conduct literature reviews of empirical research where relevant. Empirical literature searches focused on studies

published from December 2011 (the date of completion of evidence reviews for the second edition) to June 2017. In the absence of any empirical research, authors sought to source expert opinion statements to guide best practice recommendations. The following sources were used to search for empirical literature: Cochrane Database of Systematic Reviews, MEDLINE, Informit, Australian Indigenous HealthInfoNet, evidence reviews from *BMJ Clinical Evidence* and *Dynamed*, and the US Centers for Disease Control. In areas where authors were aware of important unpublished and ongoing work that may influence future directions, these were cited as either personal communication or unpublished data.

Authors were instructed to objectively examine the evidence and summarise the recommendation, critically appraise the source of the recommendation, assign the level and strength of evidence (refer to below) and record the relevant references (refer to below). To update chapters from the second edition, authors were provided with documents outlining the evidence base used for the relevant chapter draft.[1] They were then asked to review the evidence to identify whether existing recommendations remained appropriate, whether any recommendations could no longer be substantiated and needed to be deleted, and whether any additional recommendations needed to be included. For sections not previously covered in the second edition, authors conducted reviews of national and international guidelines and the empirical literature via the process described above.

The Red Book format for providing recommendations was adapted to incorporate the five prevention categories used to guide the scope of interventions.[9] It was assumed that the populations of interest for all recommendations in the National Guide are Aboriginal and Torres Strait Islander peoples. A reporting template was used to guide authors in the format of the recommendations, as shown below.

Recommendations: Smoking					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	People aged >10 years	**Ask** all patients if they smoke tobacco (refer to Chapter 1: Lifestyle, 'Introduction': Box 1)	Opportunistic and as part of an annual health assessment	IA	10, 16, 17, 35, 36

Critical appraisal and assigning the level and strength of evidence

For guidelines that were already endorsed or developed by the following organisations, authors were instructed to not conduct a critical appraisal process: NHMRC, NICE, SIGN, USPSTF, NZGG. For other guidelines, authors were recommended to use the AGREE II critical appraisal tool to assess for guideline quality.[14,15] For systematic reviews and randomised controlled trials (RCTs), the SIGN appraisal tools were recommended.[16,17]

Although it was not intended that these questions be formally reported in the National Guide, authors were provided with the following questions to assist in the assessment of a study/guideline recommendation:

- What are the most relevant primary and secondary preventive interventions to report in the National Guide on this topic?
- Is the intervention relevant to primary healthcare?
- For relevant interventions, what is the magnitude of effect? This may be represented by absolute rates and number needed to treat (NNT) or number needed to harm (NNH), or by absolute differences or differences in relative risk.
- Are the benefits/harms clinically significant?
- Is the intervention generalisable to the Aboriginal and Torres Strait Islander population?
- Are there any caveats to implementing this intervention?

Each recommendation was graded according to the NHMRC classification scheme for assigning level (Table 1) and strength (Table 2).[18] For many interventions, there was limited evidence from which to draw conclusions on the intervention's effectiveness. Expert opinion was therefore considered very important in interpreting the evidence and making judgements about the relevance of recommendations to Aboriginal and Torres Strait Islander health (refer to 'Generalisability of recommendations to an Aboriginal and Torres Strait Islander health context').

Recommendations based on expert opinion were assigned as Good Practice Points (GPPs). In determining a GPP, there was regular discussion between authors, the editors and external experts. This process was especially important for determining the optimal frequency of an intervention or the age from which to commence an intervention. For example, on the basis of disease prevalence data, many preventive interventions are recommended to commence at an earlier age in Aboriginal and Torres Strait Islander peoples than in the general population.

NHMRC levels of evidence and grades for recommendations

The levels of evidence and grades for recommendations are derived from the *NHMRC additional levels of evidence and grades for recommendations for developers of guidelines.*[18]

Table 1. Level of evidence hierarchy[18]

I	A systematic review of level II studies
II	A randomised controlled trial
III–1	A pseudorandomised controlled trial (ie alternate allocation or some other method)
III–2	A comparative study with concurrent controls: non-randomised, experimental trial; cohort study; case-control study; interrupted time series with a control group
III–3	A comparative study without concurrent controls: historical control study; two or more single-arm studies; interrupted time series without a parallel control group
IV	Case series with either post-test or pre-test/post-test outcomes

Table 2. Body of evidence matrix[18]

	A (Excellent)	B (Good)	C (Satisfactory)	D (Poor)
Component	Body of evidence can be trusted to guide practice	Body of evidence can be trusted to guide practice in most situations	Body of evidence provides support for some recommendation(s) but care should be taken with this application	Body of evidence is weak and recommendation must be applied with caution
Evidence base*	One or more level I studies with a low risk of bias or several level II studies with a low risk of bias	One or two level II studies with a low risk of bias or a[n] SR/ several level III studies with a low risk of bias	One or two level III studies with a low risk of bias, or level I or II studies with a moderate risk of bias	Level IV studies, or level I to III studies/ SRs with a high risk of bias
Consistency†	All studies consistent	Most studies consistent and inconsistency may be explained	Some inconsistency reflecting genuine uncertainty around clinical question	Evidence is inconsistent
Clinical impact	Very large	Substantial	Moderate	Slight or restricted

Table 2. Body of evidence matrix[18]				
	A (Excellent)	B (Good)	C (Satisfactory)	D (Poor)
Generalisability	Population/s studied in body of evidence are the same as the target population for the guideline	Population/s studied in the body of evidence are similar to the target population for the guideline	Population/s studied in body of evidence differ to target population for guideline but it is clinically sensible to apply this evidence to target population‡	Population/s studied in body of evidence differ to target population and hard to judge whether it is sensible to generalise to target population
Applicability	Directly applicable to Australian healthcare context	Applicable to Australian healthcare context with few caveats	Probably applicable to Australian healthcare context with some caveats	Not applicable to Australian healthcare context

SR = systematic review; several = more than two studies

*Level of evidence determined from the NHMRC evidence hierarchy (Table 1).

†If there is only one study, rank this component as 'not applicable'.

‡For example, results in adults that are clinically sensible to apply to children or psychosocial outcomes for one cancer that may be applicable to patients with another cancer.

Editorial review, expert review and stakeholder consultation

Authors submitted their drafts to the clinical lead, who reviewed and provided feedback for suggested revisions. Several chapters, including those authored by the clinical lead, were also reviewed by the NACCHO project lead. An editorial team comprising the clinical lead, the NACCHO project lead and RACGP representatives held meetings to review all chapter drafts.

Drafts were sent to several independent expert reviewers for appraisal. Reviewers were given a template to complete in which they were asked the following questions:

- Are the recommendations consistent with your knowledge of the evidence?
- If applicable to this topic, are the GPPs consistent with your understanding?
- Where there is a deviation in the above, is that deviation acceptable within the limits of our knowledge?
- In relation to primary prevention (and possibly secondary prevention), is there anything that is vital to this topic that has been missed? If so, what?
- Please include any other feedback you may have on this topic.

Reviewers were also invited to make specific comments and suggested wording changes within each topic draft. The recommended changes to the topic draft were reviewed by the clinical editor, who then corresponded with the author to respond to the recommendations. Some external peak body organisations were also consulted to review chapter recommendations, and their feedback was incorporated through editorial team review. The editorial team determined the final content of the drafts in consultation with authors. Most peak body organisations were asked to consider the final drafts for their support and/or endorsement. The contributing authors, external reviewers and external peak body organisations are listed in the acknowledgements.

Role of the funding source, intellectual property and conflicts of interest

The revision and updating of the National Guide is a joint project of NACCHO and RACGP Aboriginal and Torres Strait Islander Health. A grant from the Australian Government Department of Health was provided through the RACGP to undertake this project through a collaboration agreement with NACCHO. This work was also supported through a pre-existing memorandum of understanding between NACCHO and the RACGP. The funding body for this project had no involvement in the conception and design of the National

Guide, nor in development of the content. The RACGP contracted a project coordinator to manage the update of the National Guide in partnership with the NACCHO project lead. The NACCHO project lead and the clinical lead had service agreements with the RACGP, while authors were required to agree to a Statement of Works with the RACGP.

NACCHO owns the intellectual property rights in the National Guide, and has granted the RACGP a licence to use and publish the National Guide as a resource for all health professionals delivering primary healthcare to Aboriginal and Torres Strait Islander peoples.

All contributing authors were asked to declare any pecuniary or other conflicts of interest, and these declarations are included in the list of authors section. External reviewers and peak body organisations were not funded and the generosity of their contribution is greatly appreciated.

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Introduction

The third edition of the *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* (National Guide) is a joint initiative of the National Aboriginal Community Controlled Health Organisation (NACCHO) and The Royal Australian College of General Practitioners (RACGP). The National Guide is a practical resource intended for all health professionals delivering primary healthcare to Aboriginal and/or Torres Strait Islander peoples. Its purpose is to provide health professionals with an accessible, user-friendly guide to best practice in preventive healthcare for Aboriginal and Torres Strait Islander patients.

Every chapter of this edition has been extensively revised, and we are pleased to include several new topics to support healthcare providers to broaden preventive care on priority health issues, such as fetal alcohol spectrum disorder, family abuse and violence, and ways to optimise child health and wellbeing. In this third edition, we continue to emphasise five types of preventive interventions: immunisation; screening for asymptomatic disease; chemoprophylaxis (using medication to prevent the onset of disease and complications of existing disease); counselling and other ways to encourage client behavioural change; and primary healthcare influences over environmental factors.

The third edition of the National Guide revision process developed several products:

- the National Guide (print and electronic), which contains evidence statements, recommendations, risk calculation tables and an outline of the development of the National Guide package
- the Evidence Base to the National Guide (electronic only), which contains the collection of evidence underpinning the guide and recommendations
- a child lifecycle summary chart (print and electronic) listing activities recommended at each age group 0–17 years
- a young people lifecycle summary chart (print and electronic) that synthesises recommendations for those aged 12–24 years
- an adult lifecycle summary chart (print and electronic) listing activities recommended at each age group from 10 years.

Purpose

The National Guide is intended for all healthcare providers delivering primary healthcare to the Aboriginal and Torres Strait Islander population. This includes general practitioners (GPs), Aboriginal and Torres Strait Islander health workers and practitioners, nurses, specialists with a role in delivering preventive care, and educators and students.

The National Guide makes specific recommendations regarding the elements of a preventive health assessment across the lifecycle. The recommendations aim to prevent disease, detect early and unrecognised disease, and promote health in the Aboriginal and Torres Strait Islander population while allowing for variations based on regional and local circumstances. The health status of Torres Strait Islander peoples is very similar to that of the Aboriginal population, and the information in the National Guide can be applied to both population groups.

Why preventive health assessments are necessary

Life expectancy was around 10 years lower for Aboriginal and Torres Strait Islander people in 2010–12 when compared with other Australians.[1] There is strong evidence that the delivery of clinical preventive health services, especially within a primary healthcare context, improves health outcomes.[2]

Access to high-quality primary healthcare forms the foundation for the Australian Government's *National Aboriginal and Torres Strait Islander Health Plan 2013–2023* to improve health outcomes for Aboriginal and Torres Strait Islander people and their families.[3] However, there are often missed opportunities for the

prevention of chronic disease and associated complications in the Aboriginal and Torres Strait Islander population, and systems to identify if clients are of Aboriginal and/or Torres Strait Islander origin are often variably implemented.[4,5]

When preventive opportunities are missed, this leads to a higher use of hospital care, which in turn increases health costs. The Aboriginal and Torres Strait Islander population has much higher rates of hospital admission for almost every health problem than other Australians.[6]

The social determinants of health

Some users have asked us: 'Why doesn't the National Guide include a chapter on the social determinants of health?' In short, the answer is that every chapter guides users to consider the social determinants of health – the conditions in which people are born, live, grow, work and age, and health system factors that may reduce inequities. It is often forgotten that health system factors such as access to appropriate, affordable and acceptable primary healthcare are also social determinants of health.[7]

These and other social determinants of health are mostly responsible for health inequities – the unfair, unjust and preventable disparities in health status seen between populations. Within the Australian health system, healthcare providers have a responsibility to shape their service provision to overcome barriers to healthcare access, and to enhance, and be accountable for, the quality of care they offer.[8,9]

Healthcare providers should consider the individual context of their patients, their social history, their biopsychosocial risks, the patient as a person, in order to form a therapeutic alliance and to share power and responsibility. These are the hallmarks of the patient-centred healthcare professional.[10] The social determinants of health may be broad and intersectoral,[11] but patient-centred healthcare systems 'can and do yield health equity gains'.[7]

How to use the National Guide

Using the recommendations

All health professionals delivering primary healthcare to Aboriginal and/or Torres Strait Islander clients should use the recommendations to enhance the clinical care they provide. The National Guide aims to complement the RACGP *Guidelines for preventive activities in general practice* (Red Book) by dealing with health issues that are specific to the Aboriginal and Torres Strait Islander population.

Cross-referencing with the Red Book

The chosen subject areas in the National Guide represent the key health issues that are amenable to primary healthcare intervention and contribute to morbidity and mortality in the Aboriginal and Torres Strait Islander population. Where issues common in the general Australian population have not been dealt with in this guide (eg urinary incontinence), GPs are encouraged to cross-reference with the Red Book, which is available on the RACGP website at www.racgp.org.au/redbook. The Red Book is a synthesis of evidence-based guidelines from Australian and international sources and provides recommendations for everyday use in general practice.

Using local guidelines

To optimise preventive health assessments, healthcare providers (particularly in regional and remote areas) are also encouraged to refer to local guidelines where they are appropriate and available. Many of the recommendations in the National Guide describe health problems that may be of concern only in certain regional areas. For example, trichiasis screening is only appropriate for an elderly Aboriginal client who was raised in a trachoma-endemic area (refer to Chapter 6: Eye health). In addition, many recommendations highlight the importance of clinical discretion in decision making. For example, making a decision to apply or not apply a 5% increment to the estimate of absolute cardiovascular risk will depend on the context and specific characteristics of your individual patient (refer to Chapter 11: Cardiovascular disease prevention).

Appraising current preventive practice

Healthcare providers should use the National Guide to systematically appraise current preventive practice, especially where recommendations for the general population have previously been applied to Aboriginal and Torres Strait Islander clients. Providers may also benefit by appraising certain screening activities for which there are 'Good Practice Points' (GPPs) – that is, expert opinion–based recommendations but little current evidence. Inappropriate preventive interventions may draw resources away from activities known to improve the health of the Aboriginal and Torres Strait Islander population (eg risk factor modification and immunisation programs).

Identifying your Aboriginal and Torres Strait Islander clients, and why

Implementation of preventive health assessments requires healthcare providers to identify the target population. Research shows that where general practices take systematic action to improve their identification processes, there is a corresponding increase in the numbers of correctly identified patients.[5]

Identifying Aboriginal and Torres Strait Islander status is a necessary precondition for participating in the Closing the Gap initiative agreed upon by the Australian Government and the Council of Australian Governments in 2008. Without practice awareness, a patient who is of Aboriginal and/or Torres Strait Islander origin cannot benefit from the various Australian Government measures such as the Practice Incentives Program Indigenous Health Incentive,[12] the Pharmaceutical Benefits Scheme (PBS) co-payment measure,[13] and specific Medicare rebates for assessments related to preventive health.

All health professionals have an important role in facilitating the identification of Aboriginal and Torres Strait Islander clients. In order for a person to identify as being Aboriginal and/or Torres Strait Islander and accept this being recorded on their medical records, a culturally supportive and culturally safe environment needs to be established and continuously demonstrated.

The RACGP resource for the *Identification of Aboriginal and Torres Strait Islander people in Australian general practice* aims to help health professionals identify their Aboriginal and Torres Strait Islander clients.[14] In addition, the *Five steps towards excellent Aboriginal and Torres Strait Islander healthcare* provides a simple outline to support practices to offer Aboriginal and Torres Strait Islander preventive health assessments.[15] These are available on the RACGP website at www.racgp.org.au/aboriginalhealth

Implementation of preventive health interventions

Most preventive interventions are best delivered opportunistically during clinical encounters in primary healthcare settings. Others are delivered through integrated approaches between primary healthcare providers and other services such as in the planning and delivery of breast cancer screening.

Using multiple strategies

Clinical information systems that support opportunistic screening through electronic reminders and outreach programs, such as the offer of vaccination in non-traditional settings, are proven strategies to enhance disease prevention and health promotion.

A preventive assessment may be undertaken in a single session between client and health provider, which may or may not simultaneously address other concerns the patient may have, or be delivered incrementally over a number of sessions. Whether clinic-based or community-based, systems used to deliver a preventive assessment need to support a holistic assessment of the client in recognition of the interdependence of many risk factors and determinants of disease.

Undertaking the interventions and follow-up

Implementation of a preventive health assessment should be undertaken by healthcare providers who have the capacity to undertake, or to arrange for, appropriate management of any abnormalities found during the assessment. Healthcare providers should always plan to follow up the patient who has had a preventive health assessment. Specific Medicare rebates can assist in this process. Providers should also be aware

of the potential psychosocial impact of preventive care, particularly when screening results in the diagnosis of a new condition. Informed consent should be obtained prior to undertaking screening and other preventive interventions, and adequate counselling should be provided when the patient is advised of the result.

For quality assurance, health services may also undertake 'health systems assessment' to explore their systems and processes for preventive healthcare. The Kanyini 'health systems assessment tool' (adapted from the Wagners Chronic Disease Model for health systems assessment)[16] is one example of an adapted Aboriginal-specific tool that can be used with or without a facilitator to explore clinic processes.[17]

Appropriate health policies

Supportive health policies, such as financial incentives and workforce training, can encourage healthcare providers to offer preventive health assessments. Those who have been screened may also require treatment, and consequently, an effective screening program may increase the demand for care where existing health service resources are already limited. Any plans to reduce premature and excess Aboriginal and Torres Strait Islander morbidity and mortality will require increased investment in health system capacity to manage previously unrecognised diseases.

The RACGP's *Standards for general practices* (5th edition) can be applied to assess if a practice can provide tailored information to patients on preventive care, and if it has systems for quality improvement activities.[18]

Aboriginal Community Controlled Health Services also have contractual obligations to report on national key performance indicators, several of which pertain to preventive healthcare delivery.[19] The National Guide can inform the evidence underpinning these indicators, and ensure they are 'fit for purpose' to support quality improvement. Indicators should be evidence-based, reflecting research, clinical expertise and patient values. Indicators may also unintentionally restrict clinical decision making if they prioritise the use of certain clinical tools over other equally suitable ones. Other unintended consequences may arise if indicators homogenise clinical decision making without considering the diversity of Aboriginal and Torres Strait Islander peoples and their health needs, thereby undermining patient-centred care.

Medicare rebates

Medicare rebates for preventive health assessments are available for all Aboriginal and/or Torres Strait Islander people of any age through an annual health assessment. This is possible through the Medicare Benefits Schedule (MBS) rebate item number 715. The National Guide contains advice on almost all elements of the requirements to claim this and many other rebates. Identification of your Aboriginal and Torres Strait Islander clients is essential to enable access to Medicare rebates for preventive health assessments.

The Department of Health has also developed resources that list and provide support to claiming these Aboriginal and Torres Strait Islander–specific MBS items.[20] GPs are advised to check the requirements in the current online MBS before claiming these and other MBS items supporting preventive healthcare and follow-up assessments. GPs need to be aware of, and comply with, the requirements of the specific MBS descriptors when providing services.

Primary Health Networks

Primary Health Networks (PHNs) have an important role to play in coordinating the delivery of primary healthcare within their regions. One of six priorities set by the Australian Government is for PHNs to focus on the health of Aboriginal and Torres Strait Islander peoples,[21] such as through a strengthened primary healthcare model of care, and preventive healthcare assessments. Healthcare providers can contact their local PHN to receive service support for the delivery of preventive health assessments.

The National Guide is available on the NACCHO and RACGP websites at www.naccho.org.au/resources and www.racgp.org.au/national-guide respectively.

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What's new in the third edition?

This third edition of the *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* (National Guide) contains a thorough update of all chapters, as well as new topics developed in response to requests from National Guide users and opportunities identified by the Project Reference Group.

The National Guide aims to complement The Royal Australian College of General Practitioners' (RACGP's) *Guidelines for preventive activities in general practice*, 9th edition (Red Book) by dealing with health issues that are specific to the Aboriginal and Torres Strait Islander population. Where issues common in the general Australian population have not been dealt with in this National Guide (eg urinary incontinence), healthcare professionals are encouraged to refer to the Red Book, available at www.racgp.org.au/redbook

New topics in the third edition	
Topic	**Scope**
Fetal alcohol spectrum disorder (FASD)	Supports healthcare professionals to understand how to make a diagnosis of FASD and to provide support for those diagnosed with FASD. It provides primary and secondary prevention strategies to reduce alcohol use in pregnancy, and recommendations for women, as well as for children at risk of FASD.
Preventing child maltreatment – Supporting families to optimise child safety and wellbeing	Provides an exploration of the multiple factors contributing to the high rates of Aboriginal and Torres Strait Islander children represented in substantiated maltreatment data. Discusses the importance of comprehensive primary healthcare, incorporating culturally responsive and trauma-informed care when working with families affected by child maltreatment, and provides recommendations on screening and behavioural interventions to prevent child maltreatment.
Family abuse and violence	Provides information to support healthcare professionals to develop a high level of awareness of the risks of family abuse and violence and how to identify and provide early intervention for victims of family abuse and for perpetrators. The chapter outlines principles to help communities address the issues and work together to prevent family abuse and violence, and intervene where necessary. To be used in conjunction with the RACGP's *Abuse and violence: Working with our patients in general practice* (White Book), www.racgp.org.au/whitebook
Lung cancer	Provides recommendations on screening asymptomatic adults, including people who smoke or have previously smoked, and lifestyle risk factor counselling on the benefits of avoiding smoking and smoke exposure.
Young people lifecycle summary wall chart	This wall chart has been developed to outline specific recommendations for young people, and complements existing child and adult charts.

Key changes to existing chapters	
Topic	**Key changes**
Smoking	New recommendations include considering intermittent oral nicotine replacement therapy for pregnant women, after explaining risks and benefits; as well as establishing a system at the health service to document and routinely update the smoking status of all patients.
Overweight and obesity	New behavioural recommendations for people with overweight or obesity, such as the importance of assessing the individual context and social factors that influence weight loss; new recommendation to continue orlistat therapy beyond three months only if the individual has lost at least 5% of their initial body weight since starting drug treatment.

Key changes to existing chapters	
Topic	**Key changes**
Physical activity	New behavioural recommendations encouraging active transport and weight-bearing and resistance exercise to prevent osteoporosis. Recommendation that all women who are pregnant should be encouraged to participate in physical activity to levels outlined in the Australian guideline recommendations. Recommendation for people with cardiovascular disease, other chronic diseases, mental health issues and cancer survivors – if the condition is stable – to commence low-intensity physical activity with slow progressions in volume and intensity. Environmental recommendations to encourage health services to support physical activity by introducing physical measures, and for health professionals to consider a range of social and contextual factors that may uniquely influence an individual's level of physical activity.
Alcohol	New recommendation to advise women who are pregnant, breastfeeding or seeking pre-conception counselling and choose to drink, to breastfeed before consuming alcohol. New environmental recommendations to consider initiatives that engage young people and school-based or classroom-based education sessions as part of promoting community-led strategies to reduce alcohol supply.
Gambling	New recommendations assess the impact on children who have parents and/or siblings who are known to have problem gambling, by assessing their nutrition and growth, physical and psychosocial health and wellbeing. Recommendation to refer people with identified problem gambling to financial counselling and legal support services.
Antenatal care	Significantly updated to align with the Australian evidence-based antenatal care guidelines, and incorporates new evidence published subsequently. Examples include recommendations on immunisation as well as on screening for genitourinary and blood-borne viral infections, measurement of height and weight in pregnancy, screening for diabetes, screening for chromosomal abnormalities, screening for social and emotional wellbeing, and screening for family abuse and violence.
Child health	Includes two new topics ('Fetal alcohol spectrum disorder' and 'Preventing child maltreatment – Supporting families to optimise child safety and wellbeing') and a significant number of key changes under 'Anaemia', 'Growth failure' and 'Childhood kidney disease'.
The health of young people	A new young people lifecycle summary chart accompanies this chapter to support healthcare professionals with screening. A new modified HEEADSSS (Home, Education/Employment, Eating, Activities, Drugs and alcohol, Sexuality, Suicide and depression, Safety) assessment tool, the *Aboriginal and Torres Strait Islander youth social and emotional wellbeing assessment*, is included in this third edition to support screening for social and emotional wellbeing. New recommendations on contraception and emergency contraception are included.
The health of older people	Has a new title and new recommendations on screening for osteoporosis for people at moderate and high risk, as well as behavioural recommendations to consider the use of hip protectors for residents of aged care facilities at risk of falling; recommendations on exercise for individuals aged >50 years without osteoporosis and for those with osteoporosis. New recommendations on dementia prevention for those with risk factors for dementia are provided.
Eye health	New recommendations for visual acuity screening and counselling on the risks of diabetic retinopathy for pregnant women with pre-existing diabetes. New recommendations for a balanced diet high in fruit and vegetables to reduce the risk of developing cataract and age-related muscular degeneration. Updated recommendations on screening for trachoma, and on discussing use of chemoprophylaxis with regional trachoma control programs.

Key changes to existing chapters	
Topic	**Key changes**
Hearing loss	New recommendation for enhanced hygiene practices to prevent cytomegalovirus. New screening recommendations, including advising parents to maintain a high index of suspicion of hearing loss in children at high risk of hearing impairment, and advising parents that absenteeism can be associated with hearing loss. Repeat neonatal hearing screening tests may be required. New behavioural, surgical and chemoprophylaxis recommendations for children with tympanostomy tubes, chronic suppurative otitis media, and otitis media with effusion.
Respiratory health	New recommendations on immunisation for pneumococcal disease prevention and influenza. New behavioural recommendations, advising weight reduction for people who have asthma and obesity or overweight. New environmental recommendations for workers in high-risk workplaces, where exposure to occupational dusts and chemicals is high. New screening recommendation for people who smoke, with healthcare professionals to consider the use of a symptom questionnaire to assist with case finding in those with chronic obstructive pulmonary disease (COPD). New behavioural recommendation for people with COPD who currently smoke, to consider referral to pulmonary rehabilitation as it has been shown to reduce COPD exacerbations. New screening recommendations for preventing bronchiectasis and chronic suppurative lung disease, and for those with a history of tuberculosis.
Acute rheumatic fever and rheumatic heart disease (RHD)	Provides numerous updated immunisation, screening, behavioural, chemoprophylaxis and behavioural recommendations to support prevention, diagnosis and treatment of acute rheumatic fever and RHD.
Cardiovascular disease prevention	New screening recommendation, lowering the age of assessing for the prevalence of any Framingham or non-Framingham risk factors to age 30 years. Healthcare providers are advised to consider adding a 5% increment to the risk assessments (five-year Framingham), using their clinical judgement.
Type 2 diabetes prevention and management	New screening recommendations suggest that given the high prevalence of diabetes, use of screening tools such as AUSDRISK are likely to be of limited benefit.
Chronic kidney disease (CKD) prevention and management	New chemoprophylaxis recommendation for adults with CKD and blood pressure (BP) consistently above 140/90 mmHg, to recommend lifestyle changes plus drug treatment aiming at BP <140/90 mmHg (or systolic BP <120 mmHg when tolerated by the patient).
Sexual health and blood-borne viruses	New screening and testing recommendations for all sexually active people aged ≤30 years and sexual partners of a person with a sexually transmitted infection. New chemoprophylaxis recommendations to consider eligibility for pre-exposure prophylaxis (PrEP) for people at higher risk of human immunodeficiency virus (HIV). New recommendations for screening ages for gonorrhoea and *trichomonas vaginalis*. New immunisation recommendations for human papillomavirus (HPV).
Prevention and early detection of cancer	Lung cancer is a new topic within this chapter. In cervical cancer prevention, there are new immunisation recommendations for HPV. New screening recommendations, aligning with the renewed national cervical screening program, with the Pap smear replaced by a new HPV cervical screening test with reflex liquid-based cytology (LBC) for oncogenic HPV-positive samples. New immunisation and screening recommendations for liver cancer. New chemoprophylaxis recommendation for breast cancer includes the availability of tamoxifen, approved for subsidy under the Pharmaceutical Benefits Scheme for primary prevention of breast cancer and able to be prescribed by general practitioners as well as medical specialists.
Mental health	Recommendation to use social and emotional wellbeing assessment tools (such as K5 or Here and Now Aboriginal Assessment [HANAA]) if necessary to guide conversations. New recommendation to provide people who have close family or friends who have died by suicide with support and referral to social and emotional wellbeing services (eg Aboriginal mental health workers).

Chapter 1: Lifestyle

Introduction

This section of the *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* (National Guide) provides recommendations for interventions to improve health outcomes related to the risk factors of tobacco, overweight and obesity, alcohol, physical activity and gambling. In addition to specific tools mentioned within each risk factor section, the '5As' model is recommended to assist primary care practitioners in a general approach to lifestyle risk factor assessment and management. The 5As model is outlined below.[1]

Box 1. The 5As model for behavioural and other interventions related to lifestyle risk factors

Assess – Ask about/assess behavioural health risk(s) and factors affecting choice of behaviour change goals or methods.

Advise – Give clear, specific and personalised behaviour-change advice, including information about personal health harms and benefits. This recognises that the practitioner can be a catalyst for action and enhance motivation for change.

Agree* – Collaboratively select appropriate treatment goals and methods based on the client's interest in and willingness to change their behaviour. This involves joint consideration of treatment options, consequences and client preferences, and setting management goals.

Assist – Using behaviour change techniques (self-help and/or counselling), aid the patient in achieving agreed-upon goals by acquiring the skills, confidence and social/environmental supports for behaviour change, supplemented with adjunctive medical treatments when appropriate (eg pharmacotherapy for tobacco dependence).

Arrange – Schedule follow-up contacts (in person or via telephone) to provide ongoing assistance/support and to adjust the treatment plan as needed, including referral to more intensive or specialised treatment. Follow-up visits often involve repeating the preceding four As.

*Some models omit the 'Agree' component and include an initial 'Ask' component in which risk factors are identified.

The 5As model was originally proposed by the US National Cancer Institute to assist with smoking cessation counselling.[2] It was then adapted by the Canadian Taskforce on Preventive Health Care and used by the US Public Health Service to report on the effectiveness of interventions to support tobacco cessation.[3] The model has since been adapted for use with broader preventive health interventions that are administered in a clinical setting.[1,4]

The 5As model is well informed by systematic reviews of evidence on behavioural interventions and is recognised as an effective mechanism for translating evidence into practice, and it has demonstrated widespread utility in Australia and internationally.[5–7] A randomised controlled trial (RCT) of the model, as part of a team-based care for obesity management, is currently underway in Canada.[8]

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Smoking

Background

Tobacco is the single greatest cause of preventable deaths in the world.[1] The World Health Organization (WHO) estimates that tobacco causes more than five million premature deaths globally every year, a figure that could rise to eight million by 2030.[1] The Surgeon General of the United States has reported that smoking causes many different chronic diseases and cancers, harming almost every organ in the body; smoking in pregnancy causes maternal, fetal and infant deaths and disease; and there is no safe level of exposure to second-hand tobacco smoke.[2]

The age-standardised smoking prevalence among Aboriginal and Torres Strait Islander peoples is 2.8 times greater than for non-Indigenous Australians, with 39% of Aboriginal and Torres Strait Islander people aged 15 years and older reporting that they smoke daily in 2014–15.[3] This prevalence has fallen from 49% in 2002, with a greater decline in non-remote than remote areas. More than half (57%) of Aboriginal and Torres Strait Islander children (0–14 years) live in a household with a person who smokes daily, and 13% live in a household where someone smokes inside.[3] Aboriginal and Torres Strait Islander mothers had more than three times the age-standardised smoking prevalence during pregnancy (45%) than non-Indigenous mothers (13%) in 2014, having declined from 50% in 2009.[4] Tobacco smoking was calculated to be responsible for 23% of the health gap between Aboriginal and Torres Strait Islander peoples and other Australians, and 12% of the total burden of disease for Aboriginal and Torres Strait Islander peoples in 2011.[5]

A national survey of 2522 people in 2012–13 found that the proportion of Aboriginal and Torres Strait Islander people who smoke daily and who reported wanting to quit (70% of all who smoke), making a quit attempt in the past year (48%), living in smoke-free homes (53%) and knowing about the most harmful effects of smoking (eg smoking causes lung cancer, 94%) was similar to that of the general population.[6] However, a smaller proportion of Aboriginal and Torres Strait Islander people who smoke daily, compared to people who smoke daily in the general population, reported social norms disapproving of smoking (62% vs 79%) and had ever sustained a quit attempt for at least a month (47% vs 60%).[7,8]

Smokeless tobacco, including native tobaccos such as pituri, continues to be chewed in Aboriginal and Torres Strait Islander communities, particularly in central Australia.[9] Although there are little data from Australia, smokeless tobacco has been shown to cause cancers of the head and neck, oesophagus and pancreas in other countries.[1]

Interventions

Australia has signed the WHO Framework Convention on Tobacco Control, the world's first public health treaty, committing to a series of evidence-based national policies to reduce smoking and the harm it causes.[10] Australia has implemented anti-tobacco mass media campaigns, pack warning labels, restrictions on tobacco advertising, price increases of tobacco through tax rises, smoke-free regulations and provided cessation services, contributing to Australia's low national smoking prevalence.[11] There is some evidence that such population health approaches also motivate Aboriginal and Torres Strait Islander people who smoke to quit. Cross-sectional and longitudinal analyses of a large national survey demonstrated the impact of noticing anti-tobacco social marketing (eg TV advertisements and posters), with localised material having greater impact; of noticing pack warning labels; and of the introduction of plain packaging.[12,13] The proportion of Aboriginal and Torres Strait Islander people who smoke daily reporting smoke-free indoor workplaces (88%) and homes (56%) was similar to that of the general population.[14] The evidence for the impact of tobacco tax rises on Aboriginal and Torres Strait Islander people who smoke is less clear.[15]

Health practitioners play a vital role in assisting and supporting smoking cessation and reducing the harms caused by smoking. At the health service level, instituting a practice system designed to identify and document tobacco use, such as a clinic screening system and the use of computer prompts, almost doubles the rate of health professional intervention and results in higher rates of cessation.[9,16]

The 5As provide an evidence-based approach to smoking cessation for health professionals.[10]

Ask: Ask all patients if they smoke and ensure that their current smoking status is recorded in the medical record.[10] Regularly – at least annually – update the smoking status in the medical records of anyone who smokes or has recently quit.[16] A systematic approach to identifying all people who smoke should be used in every health service and has been shown to increase the support offered by health practitioners.[17] Almost all (93%) Aboriginal and Torres Strait Islander people who smoke daily who had seen a health professional in the previous year reported being asked if they smoked, according to a national survey.[18]

Assess: Assess the willingness of people who smoke to quit and their nicotine dependence to guide treatment choices.[10,17,19,20] Smoking cessation advice should be sensitive to the patient's preferences, needs and circumstances. There is no evidence that classifying people who smoke into the four stages of readiness to quit (pre-contemplation, contemplation, preparation, action and maintenance) is more useful than any other approach in smoking cessation. Assessment of nicotine dependence can be done using the six questions in the Fagerström test for nicotine dependence.[21] A simpler assessment can be done by asking the following three questions:[10]

1. How soon after waking do you have your first cigarette?
2. How many cigarettes do you have each day?
3. Have you had cravings for a cigarette, or urges to smoke and withdrawal symptoms when you have tried to quit?

Smoking within 30 minutes of waking, smoking more than 10 cigarettes per day and withdrawal symptoms are indicators of nicotine dependence.

Advise: Advise all people who smoke to quit in a clear, non-confrontational way – for example, 'The best thing you can do for your health is to quit the smokes'.[10] This brief, repeated and consistent advice can increase smoking cessation rates (number needed to treat [NNT] with brief advice only = 50–120, based on a 2% unassisted quit rate at 12 months).[10,22] Such advice can be as brief as 30 seconds, but should be followed by offers of assistance to quit.[16] More Aboriginal and Torres Strait Islander people who smoke daily and who have seen a health professional in the past year report that they have been advised to quit (75%), compared to a similar sample of all Australian people who smoke daily (56%).[18] These Aboriginal and Torres Strait Islander people who smoke daily were 2.0 times more likely to have made a quit attempt in the past year than those who had not been advised to quit.

Assist: Assist smoking cessation with multiple sessions of individual, group, telephone or text messaging cessation support, and recommend smoking cessation pharmacotherapies to nicotine-dependent people who are interested in quitting.

There is a dose–response relationship between the total duration of face-to-face counselling and advice and successful cessation.[17] There is no evidence that any particular behaviour change method is more effective than another, but the basic principles of setting a quit date, emphasising the importance of abstinence and providing multi-session support (preferably four or more sessions) should be adhered to.[16] A meta-analysis of two randomised controlled trials (RCTs) at Aboriginal Community Controlled Health Services (ACCHSs) demonstrated that patients who were allocated to intensive counselling and support were 2.4 times more likely to successfully quit than patients who received usual care.[23]

Quitline (phone 137 848 or 13QUIT) offers cessation counselling from trained Aboriginal and Torres Strait Islander counsellors who will call the person who smokes and proactively provide follow-up phone calls.[10] Proactive services have been shown to be more effective than relying on the person who smokes to call Quitline.[10,16] Similarly, text-messaging services are effective in increasing smoking abstinence (eg QuitTxt; refer to 'Resources').[24] However, the evidence for internet-based quitting support is only promising but inconsistent, and there were no rigorous trials of smartphone apps that could be included in the latest Cochrane review.[10,25] The additional benefit of providing written self-help material (eg pamphlets) is minimal.[10]

In a large national survey, more Aboriginal and Torres Strait Islander people who had been advised to quit by a health professional reported being referred to Quitline (28%) or a quit-smoking website (27%) than to a quit

course, group or clinic (16%). However, participants were more likely to follow through with the referrals to these courses, groups or clinics, and so more attended these than used either the Quitline or a website.[18]

Pharmacotherapies increase the effectiveness of smoking cessation counselling and should be offered to all dependent people who smoke who wish to quit, except those for whom there are medical contraindications.[10] All three smoking cessation pharmacotherapies available in Australia (nicotine replacement therapy [NRT], varenicline and bupropion) have been shown to be effective in meta-analyses.[10,26] A recent Cochrane review found that monotherapy with varenicline or combining two types of NRT were the most effective forms of therapy.[26] However, a more recent large RCT found no difference between NRT patches and either varenicline or combination NRT.[27]

Aboriginal and Torres Strait Islander people who smoke daily are less likely to use NRT and other smoking cessation therapies than non-Indigenous people who smoke, even though they are just as likely to believe that these therapies help people to quit.[28] These medicines can often be dispensed at no or reduced cost to Aboriginal and Torres Strait Islander patients, either through section 100 of the *National Health Act 1953* in remote areas or elsewhere through the Closing the Gap PBS Co-Payment Programme.[29,30]

Do not use varenicline or bupropion in women who smoke who are pregnant or breastfeeding.[10,16,31,32] There is insufficient evidence that NRT is effective in increasing smoking cessation in pregnancy, but if counselling has not been successful it may be reasonable to consider using intermittent oral NRT (eg inhaler or lozenges), after explanation of risks and benefits (NRT delivers lower doses of nicotine to the fetus and breast milk without the other toxins in tobacco smoke). Similarly, although there is inadequate evidence that NRT is effective in increasing cessation rates in young people, it may still be used following careful discussion with the patient and their carer if appropriate. Varenicline and bupropion, however, are not approved for use in people who smoke aged under 18 years.[10]

The benefit from 'vaping' e-cigarettes or electronic nicotine delivery systems (ENDS) in assisting quitting remains contentious. The use of e-cigarettes has been increasing in Australia; 31% of adults who smoke had used e-cigarettes in 2016, compared to 18% in 2013.[33] A 2016 Cochrane review found some evidence that e-cigarettes assist quitting, but no e-cigarettes have yet been approved by the Therapeutic Goods Administration (TGA) for this purpose, and in 2017 the National Health and Medical Research Council (NHMRC) recommended there was insufficient evidence for their use in cessation.[34] There is also insufficient evidence for other commonly used therapies: hypnotherapy, acupuncture and 'Allen Carr's Easyway' method with private clinics run by people who have quit smoking by using this method.[10]

Arrange: Arrange follow-up visits to discuss and support progress. It is recommended that counselling continue for four visits and pharmacotherapy continue for 8–12 weeks. Relapse to smoking is common in the month following starting a quit attempt; however, there is no intervention shown to effectively reduce relapse.[10]

Recommendations: Smoking					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	People aged >10 years	**Ask** all patients if they smoke tobacco (refer to Chapter 1: Lifestyle, 'Introduction': Box 1)	Opportunistic and as part of an annual health assessment	IA	10, 16, 17, 35, 36
	People who currently smoke	**Assess** willingness to quit and the level of nicotine dependence to guide intervention choice (Box 1)	Opportunistic	GPP	17
Behavioural	People who currently smoke	**Advise** all people who smoke to quit	Opportunistic, ideally at every visit, and as part of an annual health assessment	IA	10, 16, 17, 36
		Assist smoking cessation with multiple individual, group, telephone (eg Quitline) sessions, or text messaging (eg QuitTxt) cessation support	Opportunistic	IA	10, 16, 17, 35, 37
		Arrange follow-up visits	Provide at least four sessions of cessation support	IA	10,16,17,36
Chemo-prophylaxis	People who smoke aged ≥18 years	Recommend smoking cessation pharmacotherapies to nicotine-dependent non-pregnant people who are interested in quitting. First-line pharmacotherapies are nicotine replacement therapy (NRT), varenicline and bupropion	Opportunistic	IA	10, 16, 17, 35
	Pregnant and breastfeeding women who smoke	Do not use varenicline or bupropion. If counselling is not successful, consider intermittent oral NRT (eg inhaler or lozenges) after explanation of risks and benefits	At each antenatal visit	GPP	10, 16, 31, 32
Environmental	People aged >10 years	Establish a system at the health service for documenting and routinely updating the smoking status of all patients	As part of a systematic health service approach	IIA	10, 17
	All people	Complement the above individual-based strategies with support for comprehensive public health approaches to tobacco control – for example: • posters and displays at the health service, community organisations and events • smoke-free rules at the health service, community organisations and events, and smoke-free homes and cars		IIIC	1, 6, 38

Box 1. Assessment of nicotine dependence[10]

1. How soon after waking do you have your first cigarette?
2. How many cigarettes do you have each day?
3. Have you had cravings for a cigarette, or urges to smoke and withdrawal symptoms when you have tried to quit?

Resources

- Australian Government, Quitnow – provides apps, factsheets, and details of media campaigns, including specific Aboriginal and Torres Strait Islander resources, www.quitnow.gov.au
- Australian Indigenous Alcohol and Other Drugs Knowledge Centre – detailed information on resources, publications, programs and projects for Aboriginal and Torres Strait Islander communities, www.aodknowledgecentre.net.au/aodkc/aodkc-tobacco
- Cancer Council Victoria, *Tobacco in Australia: Facts and issues* (2016) – a comprehensive review of the major issues in smoking and health in Australia, www.tobaccoinaustralia.org.au
- Commonwealth of Australia, *Medicines to help Aboriginal and Torres Strait Islander people stop smoking: A guide for health workers* (2011), email IndigenousTobacco@health.gov.au to obtain a copy
- Menzies School of Health Research, Tobacco Control Audit Tool – assists health services to undertake continuous quality improvement audits of tobacco control activities, www.menzies.edu.au/page/Resources/Tobacco_Control_Audit_Tool
- Quitline, phone 13 7848 or 13QUIT to arrange a free call back and follow-up phone calls
- QuitTxt, www.quitcoach.org.au/QuitTextInformation.aspx
- The Royal Australian College of General Practitioners, *Supporting smoking cessation: A guide for health professionals* (2011, updated 2014), www.racgp.org.au/your-practice/guidelines/smoking-cessation

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Overweight and obesity

Background

Obesity is a surplus of body weight due to an excess accumulation of body fat. Being overweight is an independent risk factor for numerous comorbidities associated with metabolic complications and/or the excess weight itself.[1] It is associated with other cardiovascular risk factors including insulin resistance, blood pressure elevation, elevated triglycerides and reduced high-density lipoprotein (HDL) cholesterol levels.[2]

Body mass index (BMI) is an approximate measure of total body fat represented by weight (kg)/height (m^2). It is the recommended measure for classifying overweight (BMI >25 kg/m^2 for adults and >85th centile for children aged 2–18 years) and obesity (BMI >30 kg/m^2 for adults and >90th centile for children aged 2–18 years).[3] It is important to note, however, that these thresholds for overweight and obesity are derived from Caucasian populations and they may not be applicable to some Aboriginal and Torres Strait Islander peoples. While there are presently no adjusted thresholds validated for Aboriginal and Torres Strait Islander peoples, a BMI of 22 kg/m^2 for overweight adults has been proposed as a more accurate representation of risk, particularly in remote populations.[4–6] However, in view of the heterogeneity of Australians who are of Aboriginal or Torres Strait Islander origin, it may not be helpful to apply different thresholds to define excess body fat in this population.

Waist circumference, as an indicator of abdominal adiposity, may be a better predictor of obesity-associated complications for Aboriginal and Torres Strait Islander populations, and should be used in combination with BMI to refine assessment of risk.[4,5,7,8] (Refer to 'Resources' for tips on waist circumference measurement.) The National Heart Lung and Blood Institute guidelines provide thresholds that combine BMI and waist circumference to assess chronic disease risk (Box 1).[9]

The 2011 Australian Burden of Disease Study found that excess weight contributed to around 8% of the total disease burden experience by Aboriginal and Torres Strait Islander peoples, and almost 10% of disease burden was attributed to dietary factors and is second only to tobacco use as the largest contributing risk factor to total disease burden for men and women aged over 35 years.[10] The 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey is the most recent comprehensive survey of dietary activity and overweight or obesity.[11] It found that two-thirds of Aboriginal and Torres Strait Islander males and females over the age of 15 years had overweight or obesity, based on BMI.[11] Further, the survey found that Aboriginal and Torres Strait Islander people were twice as likely to report no usual daily fruit intake and seven times more likely to report no daily vegetable intake when compared with non-Indigenous Australians.[11]

Poor food supply is a major barrier to addressing healthy nutrition for Aboriginal and Torres Strait Islander people. A 2008 survey in the Northern Territory found that 55% of surveyed communities did not have access to any fresh food for extended periods.[12] In both urban and remote areas food access is affected by low income and inadequate transport, and overcrowding, poor housing and inadequate cooking and food storage facilities are additional environmental factors.[13] Community store and takeaway food is often nutritionally poor and apart from traditional food sources is the principal source of food in many areas.[14] Even if nutritious, less energy-dense food is available, it is disproportionately more expensive than energy-dense food and therefore is less accessible to people on low incomes.[15–17] A recent study examined the increasing gap in affordability and accessibility of nutritional food occurring between remote and urban areas. It found that individuals living in remote areas pay the highest prices in Australia for healthy food and drinks.[17]

Interventions

There are myriad dietary interventions that have been trialled and very little evidence to suggest that any particular dietary intervention is superior. Generally, a low-energy diet, achieved particularly through reduction in total fat intake, is the most effective intervention for weight loss.[18] The Australian dietary guidelines for adults are highlighted in Box 2.[19] Two recommendations that may be more relevant to some Aboriginal and Torres Strait Islander communities are also included.

An evidence-based approach to weight management has been outlined in the National Health and Medical Research Council (NHMRC) 2013 guidelines using the 5As framework (refer to Chapter 1: Lifestyle, 'Introduction').[20]

Ask and assess:

- Assess adults for overweight or obesity to identify people who may benefit from advice about weight management and/or intervention.
- Conduct routine assessment of BMI and waist circumference.
- Assess for risk or presence of comorbidities that may be influenced by overweight and obesity to enable overall risk to be estimated and for conditions to be managed together.
- Ask about other contributors to weight gain (eg medications such as psychotropic drugs, steroids, insulin, quitting smoking) and weight history (including previous weight loss attempts) as part of the assessment of people who are overweight or obese.
- Discuss a person's readiness for behavioural change by talking about the person's interest and confidence in making changes, as well as the benefits and difficulties of weight management.

Advise: Adults who are overweight or obese should be advised that modest weight loss reduces cardiovascular disease (CVD) risk factors. People with diabetes, pre-diabetes, kidney disease and sleep apnoea should be advised that a 5% weight loss is associated with improvements in these conditions.[20] Although the evidence base is not as strong, weight loss of any amount is also associated with improvements in quality of life, self-esteem and depression symptoms.[20]

Assist: In terms of assistance, counselling to promote healthy behaviours, reduced energy intake and increased physical activity in people with overweight or obesity is widely recommended in clinical guidelines. Encouraging people to adopt healthier diets as part of a specific weight management plan, which includes at a minimum targeted information, goal setting, and follow-up consultations, has been shown to change dietary intake and lead to improved health outcomes.[21] Designing tailored dietary interventions that aim to produce a 2500 kg energy deficit per day is recommended in most cases.[20] A combination of advice on diet and exercise is more effective than either diet or exercise alone.[21] Cognitive-focused behavioural interventions include situational control and stimulus avoidance, cognitive reframing, reinforcement techniques, self-recording of calorie intake and eating behaviours, goal setting and relapse prevention strategies. The combination of diet plus exercise plus behavioural interventions produces more beneficial outcomes than each component in isolation.[20,22] Weight and waist circumference are easy to self-measure and there is some evidence that self-weighing and monitoring are effective in achieving weight loss.[23]

Intensive interventions are recommended when standard measures have not been successful. These include very low energy diets, weight loss medication and surgery. Very low-energy diets involve replacing one or more meals each day with foods or formulas providing a specified number of kilojoules. There is some evidence that these diets are associated with significant weight loss, usually when implemented in conjunction with medically superposed programs.[20]

Orlistat is the most effective agent in the treatment of obesity. If it is used, it should be prescribed in combination with a weight-reducing diet and other lifestyle changes to maximise its effectiveness. It also causes small decreases in total cholesterol, glycosylated haemoglobin and progression to diabetes.[22,24] Orlistat in combination with behavioural interventions can lead to greater weight loss than behavioural interventions alone.[22,24] The most common side effects of orlistat medication are gastrointestinal and these are more likely if the diet is high in fat. Typically, treatment should only be continued beyond 12 weeks if there has been at least a 5% weight loss. Orlistat increases the risks of liver damage and kidney stones and there are regulatory agency warnings to alert health professionals and patients to these risks. Prolonged use for 12 months or longer is associated with malabsorption of fat-soluble vitamins and may require additional supplementation, particularly for people with diets that may be deficient in these vitamins. The risks and benefits should therefore be thoroughly discussed before considering adding orlistat to behavioural interventions.

Systematic reviews have found that bariatric surgery, mainly in people with a BMI ≥35kg/m^2, is an effective weight loss intervention.[25–27] Bariatric surgery encompasses a range of procedures that are either restrictive (eg adjustable gastric banding, sleeve gastrectomy), a gastric bypass (eg bilio-pancreatic diversion) or a combination of the two. All of these procedures have been shown to reduce all-cause mortality and offer a number of other clinically significant health outcomes (eg improved cardiovascular risk, glycaemic control and renal function).[27] The degree of weight loss is influenced by the type of surgery performed, with gastric bypass procedures tending to produce the greatest weight loss but at a higher complication rate.[25] Adjustable gastric banding has lower mortality and complication rates than gastric bypass procedure, but the reoperation rate is higher and weight loss is less substantial.[25] Sleeve gastrectomy appears to be more effective in weight loss than adjustable gastric banding and is comparable to gastric bypass.[25] One large cohort study found that surgery is associated with some harms (wound complications, bleeding, thromboembolism, pulmonary complications, so the decision to recommend surgery should be balanced against these harms.[22] There are few studies examining long-term outcomes (beyond two years) from bariatric surgery. One systematic review found that gastric bypass had better outcomes than gastric band procedures for long-term weight loss, type 2 diabetes control and remission, hypertension, and hyperlipidaemia.[28] Insufficient evidence exists regarding long-term outcomes for gastric sleeve resections.[28]

Arrange: Although current evidence is lacking, most clinical guidelines recommend a period of review and monitoring following the initial assessment and advice. If there is no weight loss (less than 1% body weight or no change in waist circumference) after three months of active management, lifestyle behaviours and causes of weight gain should be reviewed. The review at three months should include calculating BMI and measuring waist circumference, and comparing these to baseline measurements and anticipated weight loss and targets; tracking progress towards goals (eg whether health behaviours have changed); monitoring changes in risk factors and comorbidities; reviewing the plan for care; and providing support and encouragement. Intensive weight-loss interventions may also be considered, depending on degree of overweight or obesity and whether comorbidities are present.

In terms of maintenance of weight loss, it should be recognised that weight regain is common after weight loss and that this is a combination of both physiological and psychological factors. However, it should be stressed that the benefits of weight loss may still be maintained even if some weight is regained. There is evidence to support adoption of ongoing specific strategies, tailored to individual situations for people who achieve an initial weight loss.[20] Such strategies have been shown to minimise the risk of weight regain. Longer term monitoring by healthcare providers also tends to achieve better outcomes.[20]

Social determinants

The above disease prevention strategies must be individualised, and a person-centred approach should be adopted (Box 3). Each person's context will be different, shaping their readiness and capacity to make lifestyle changes. The capacity to make changes will also be reduced if patients have comorbidity. One reason for the limited success of prevention programs is the failure to incorporate an intersectoral approach to influence the social determinants of overweight and obesity. Care plans incorporating weight-loss recommendations should ensure that factors such as social isolation, reduced health literacy, unemployment, financial constraints, access to recreational facilities, lack of transport, physical and economic access to healthy food (food security), and other contextual barriers to a healthy diet and weight loss are considered, with local support provided to address the problems identified.

Local supports can be identified through a range of non-government organisations, Aboriginal Community Controlled Health Services, integrated care models such as 'health pathways' (developed by several primary health networks), social worker referral, or other health navigation initiatives such as RedLink in Redfern, New South Wales. Chronic disease care coordinators (care coordination and supplementary services program) at the primary health network level may also assist (refer to 'Resources').

Interventions to improve food security include school-based nutrition education programs, structured workshops, cooking classes, demonstrations and community kitchens. There is both local and international evidence to suggest that these programs can improve participants' food security through developing cooking, shopping and budgeting skills, as well as reduce social isolation.[29] Interventions that employ a peer-to-peer education model are likely to be more effective in enhancing food security.

The National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan identified the following seven priority areas to build on efforts to improve access to nutritious and affordable food across urban, rural and remote communities:[30]

1. Food supply in remote and rural communities
2. Food security and socioeconomic status
3. Family-focused nutrition promotion
4. Nutrition issues in urban areas
5. The environment and household infrastructure
6. Aboriginal and Torres Strait Islander nutrition workforce
7. National food and nutrition information systems

The 2009 National Preventative Health Strategy similarly stressed that multi-component, community-based programs are critical to reducing the obesity-related disease burden experienced by Aboriginal and Torres Strait Islander peoples.[31] A number of strategies have been introduced to improve remote store food supply, including food production, freight subsidies, store food and nutrition policies, improved management of stores through training and education, store charters outlining consumers' and store operators' rights and obligations, takeaway outlet interventions, food aid and food subsidy programs, interventions to improve storage and kitchen facilities, and health education.[16,32–34]

The complexity of interventions highlights the importance of coordinated action between health and non-health sectors to improve the range, quality, variety and cost of food supplies to remote and rural communities. It is important that primary care practitioners are aware of the breadth and complexity of these interventions, as they may be able to play a key role in their implementation at the local level, and that they support each individual patient.

Recommendations: Overweight and obesity

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All people aged <18 years	Assess body mass index (BMI) using age-specific and sex-specific centile charts (refer to Chapter 3: Child health, and 'Resources')	Opportunistic and as part of an annual health assessment	GPP	35
	All people aged ≥18 years	Assess BMI and waist circumference (Box 1)	Opportunistic and as part of an annual health assessment	IB	20, 22, 36, 37
		Specific groups associated with improved outcomes from BMI/ waist conference monitoring include: • individuals seeking advice on weight management • those with conditions associated with overweight and obesity (cardiovascular disease [CVD], diabetes, stroke, gout, liver or gallbladder disease)			

Recommendations: Overweight and obesity					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	All people aged ≥18 years	Provide advice to promote healthy eating and physical activity as per Australian guidelines (Box 2; and refer to Chapter 1: Lifestyle, 'Physical activity')	Opportunistic	IA	20
	Adults with overweight or obesity	Advise that modest weight loss of 5% or more has multiple health benefits, particularly lowered cardiovascular, diabetes and kidney disease risks	Opportunistic and as part of an annual health check	IA	20
		Develop a weight management plan that must include: • targeted information as per Australian dietary guidelines (Box 2) • goal setting • at least one follow-up consultation • an assessment of individual contextual and social factors that influence weight loss and maintenance (Box 3) • individualised strategies to support weight loss or weight maintenance, including context-specific social supports (if necessary)	Opportunistic and as part of an annual health check	IA	22
		Encourage regular self-weighing		IC	23
		Encourage a net energy deficit of 2500 kilojoules per day through combined dietary and physical activity interventions as per Australian dietary and physical activity guidelines		IA	20, 22, 36, 37
		Consider referral to specialist services, dietician and/or exercise physiologist or telephone coaching services (refer to 'Resources') if available		GPP	
		Individual or group-based psychological interventions* are recommended in combination with dietary and physical activity advice		IA	22, 28
	Children with overweight or obesity	Develop a targeted weight management plan as for adults. This plan must involve at least one parent/carer and aim to change the whole family's lifestyle (refer to 'Resources')	Opportunistic and as part of an annual health check	IB	22, 37

Recommendations: Overweight and obesity					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural		Except in severe obesity, weight maintenance rather than weight loss is recommended for healthy growth and development Recommend referral for specialist review for children with severe obesity		IVD	22
Chemo-prophylaxis	People aged ≥18 years with one or more weight-related comorbidities present (severe mobility restriction, arthritis, type 2 diabetes) and a BMI ≥28 kg/m^2	Assess risk–benefit of orlistat on an individual basis and only prescribe it as part of a comprehensive obesity management plan Continue orlistat therapy beyond three months only if the person has lost at least 5% of their initial body weight since starting drug treatment. Monitor for malabsorption of fat-soluble vitamins if prolonged use is being considered	Opportunistic and as part of an annual health check	IA	20, 22, 36, 37
Surgical	People aged ≥18 years with one or more weight-related comorbidities present (as above) and a BMI ≥35kg/m^2	Assess risk–benefit of bariatric surgery on an individual basis in conjunction with lifestyle interventions and as part of a comprehensive specialist management program	Opportunistic	IA	20, 22, 36, 37
Environmental	Community	Advocate for multifactorial and coordinated community-based interventions to increase access to healthy and nutritious food (eg subsidised healthy food in stores)		GPP	15, 17, 32, 34

*Cognitive-focused behavioural interventions include:

- situational control and stimulus control, avoiding cues to over-eating
- cognitive reframing and reinforcement techniques
- self-recording of calorie intake and eating behaviours
- goal setting and relapse prevention strategies.

Box 1. Combining measures to assess obesity and disease risk* in adults[9]

Classification	Body mass index (BMI) (kg/m²)	Disease risk (relative to normal measures)	
		Waist circumference Men 94–102 cm Women 80–88 cm	Waist circumference Men >102 cm Women >88 cm
Underweight	<18.5	–	–
Healthy weight	18.5–24.9	–	Increased
Overweight	25.0–29.9	Increased	High
Obesity	30.0–39.9	High to very high	Very high
Severe obesity	>40	Extremely high	Extremely high

*Risk of type 2 diabetes, elevated blood pressure and cardiovascular disease (CVD).

Box 2. Australian dietary guidelines for Australian adults[19]

Guideline 1: To achieve and maintain a healthy weight, be physically active and choose amounts of nutritious food and drinks to meet your energy needs

- Children and adolescents should eat sufficient nutritious foods to grow and develop normally. They should be physically active every day and their growth should be checked regularly.
- Older people should eat nutritious foods and keep physically active to help maintain muscle strength and a healthy weight.

Guideline 2: Enjoy a wide variety of nutritious foods from these five food groups every day

- Plenty of vegetables of different types and colours, and legumes/beans
- Fruit
- Grain (cereal) foods, mostly wholegrain and/or high-cereal varieties, such as breads, cereals, rice, pasta, noodles, polenta, couscous, oats, quinoa and barley
- Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans
- Milk, yoghurt, cheese and/or their alternatives, mostly reduced fat
- Choose store foods that are most like traditional bush foods*
- Enjoy traditional bush foods whenever possible*

And, drink plenty of water.

Guideline 3: Limit intake of foods containing saturated fat, added salt, added sugars and alcohol

- Limit intake of foods high in saturated fat such as many types of biscuits, cakes, pastries, pies, processed meats, commercial burgers, pizza, fried foods, potato chips, crisps and other savoury snacks.
  a. Replace high-fat foods that contain predominately saturated fats such as butter, cream, cooking margarine, coconut and palm oil with foods that contain predominately polyunsaturated and monounsaturated fats such as oils, spreads, nut butters/pastes and avocado.
  b. Low-fat diets are not suitable for children under the age of two years.
- Limit intake of foods and drinks containing added salt.
  a. Read labels to choose lower sodium options among similar foods.
  b. Do not add salt to foods in cooking or at the table.
- Limit intake of foods and drinks containing added sugars such as confectionary, sugar-sweetened soft drinks and cordials, fruit drinks, vitamin waters, energy and sports drinks.
- If you choose to drink alcohol, limit intake. For women who are pregnant, planning a pregnancy or breastfeeding, not drinking alcohol is the safest option.

Guideline 4: Encourage, support and promote breastfeeding

Guideline 5: Care for your food; prepare and store it safely

*Additional recommendations specific to some Aboriginal and Torres Strait Islander communities.

Box 3. Social and contextual factors that influence disease prevention strategies

Disease prevention strategies for obesity and other lifestyle-related conditions need to be individualised, and a person-centred approach should be adopted.

- Recognise that each person's context will be different and this will shape their readiness and capacity to make lifestyle changes. The capacity to make changes will be reduced if multiple comorbid conditions are present.
- Care plans incorporating weight loss recommendations should take consideration of the following factors; where possible, implement local support services to address these factors:
  - social isolation
  - reduced health literacy
  - unemployment and financial constraints
  - limited availability of recreational facilities
  - difficulties accessing transport support
  - limited physical and economic access to healthy food (food security).
- Consider intersectoral approaches to influence the social determinants of overweight and obesity (eg partnerships with providers of recreational facilities, establishment of men's and women's groups).

Resources

Weight, BMI and waist assessment

- Centers for Disease Control and Prevention, Growth charts, www.cdc.gov/growthcharts/cdc_charts.htm
- Department of Health, Helpful tips for measuring waist circumference, http://healthyweight.health.gov.au/wps/portal/Home/get-started/are-you-a-healthy-weight/how-do-you-measure-your-waist-circumference/!ut/p/a0/04_Sj9CPykssy0xPLMnMz0vMAfGjzOJ9LFydPbxMDD3djQMMDDzdnEP8Q8OcjNy9DPULsh0VAWZyjas
- World Health Organization, BMI charts for children:
  - Children aged 5–19 years, www.who.int/growthref/who2007_bmi_for_age/en/index.html
  - Children aged under <5 years, www.who.int/childgrowth/standards/bmi_for_age/en/index.html

Department of Health fact sheets

- Dietary guidelines for adults brochure, www.eatforhealth.gov.au/sites/default/files/files/the_guidelines/n55g_adult_brochure.pdf
- Dietary guidelines for children brochure, www.eatforhealth.gov.au/sites/default/files/files/the_guidelines/n55f_children_brochure.pdf
- Healthy drinks resource package, www.health.gov.au/internet/publications/publishing.nsf/Content/sugar-drinks-toc
- Poster, www.eatforhealth.gov.au/sites/default/files/files/the_guidelines/indigenous_australian_dietary_guidelines_poster_HiRes.pdf

Resources for assisting with addressing social needs

- Health pathways (New Zealand):
  - www.healthpathwayscommunity.org/About.aspx (generic information)
  - www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/quest-integrated-care-new-zealand-timmins-ham-sept13.pdf (case study on integrated health and social care)
- RedLink, www.facs.nsw.gov.au/about_us/media_releases/media_release_archive/new-era-in-redfern-towers

Other fact sheets and resource kits

- Apunipima Cape York Health Council, Food tips for being a healthy weight, www.apunipima.org.au/images/Nutrition_Resources/Weight.PDF
- Heart Foundation, Obesity fact sheet, https://heartfoundation.org.au/images/uploads/publications/NAHU-Obesity.pdf
- Queensland Health, Overweight children, www.healthinfonet.ecu.edu.au/uploads/resources/17652_17652_2012.pdf
- NSW Health, Healthy kids resources for health professionals, https://pro.healthykids.nsw.gov.au

Free Get Healthy telephone coaching services for residents in New South Wales, Queensland and South Australia

- New South Wales, www.gethealthynsw.com.au
- Queensland, www.gethealthyqld.com.au
- South Australia, www.sahealth.sa.gov.au/wps/wcm/connect/Public+Content/SA+Health+Internet/Healthy+living/Get+healthy

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Physical activity

Background

Physical activity is any bodily movement produced by skeletal muscles that results in energy expenditure.[1] This definition importantly recognises that physical activity is not restricted to structured exercise programs. Lack of physical activity is an independent risk factor for a range of diseases, in particular cardiovascular disease (CVD), diabetes, some cancers and osteoporosis.[2] In addition to premature morbidity and mortality, globally it has been estimated that physical inactivity cost healthcare systems $53.8 billion worldwide in 2013, of which $31.2 billion was paid by the public sector, $12.9 billion by the private sector, and $9.7 billion by households.[3]

Activity can be classified as sedentary, light, moderate and vigorous. Non-vigorous (light or moderate) physical activity reduces the risk of all-cause mortality, with the greatest benefits apparent in moving from no activity to low levels of activity. Two-and-a-half hours per week of moderate physical activity (equivalent to 30 minutes daily of moderate intensity activity on five days a week) compared with no activity is associated with a reduction in mortality risk of 19%, while seven hours per week of moderate activity compared with no activity reduced the mortality risk by 24%.[4] Being based on self-reported data, this may be an underestimate of the true mortality benefit from physical activity. Other studies using objective measures of physical activity expenditure have shown up to a 69% reduction in mortality in the upper tertile of activity when compared with the lower tertile.[5]

Sedentary activities are defined as activities incurring no more than 1.5 metabolic equivalents and include the specific behaviours of sitting and lying down.[6] One metabolic equivalent is defined as an energy expenditure of 1 kcal/kg/hour and is roughly equivalent to the energy cost of sitting quietly. Common sedentary activities include television viewing, recreational screen time, sitting during leisure time, sitting in a car, sitting during main activities (work, school, housework) and occupations that involve prolonged sitting. High amounts of sedentary behaviour are associated with increased risks of several chronic conditions (especially CVD, diabetes and cancer) and all-cause mortality. These associations appear to be independent of the level of physical activity. Consequently, sedentary behaviour, even when accompanied by adequate levels of physical activity, still confers an increased risk of developing chronic conditions.[6,7]

The 2011 Australian Burden of Disease Study found that physical inactivity contributed to around 6% of the total disease burden experienced by Aboriginal and Torres Strait Islander peoples.[8] By contrast with most other risk factors, physical inactivity is equally and highly prevalent among Aboriginal and Torres Strait Islander peoples when compared with non-Indigenous people. The 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey found the following:[9]

- 47% of Aboriginal and Torres Strait Islander adults (aged ≥18 years) in non-remote areas met the target of 30 minutes of moderate activity on most days, which is similar to the rates observed in non-Indigenous adults
- more males than females met the target of moderate physical activity per week (52% compared to 42%) in non-remote areas
- a higher proportion of women across all age groups in remote areas were physically inactive compared to males (68% compared to 53%).

Interventions

Physical activity behaviours are influenced by individual (eg biological and psychological attributes), social (eg family, affiliation group, and work) and environmental opportunities and constraints (eg built environment and policy factors).[10] There is strong evidence that interventions to increase physical activity in both children and adults can lead to significant risk reductions in morbidity and mortality, particular from chronic diseases such as CVD and diabetes.[11–14]

Further, a health benefit accrues to people who increase their physical activity levels, even in the absence of weight reduction.[15] There is also strong evidence from systematic reviews[16] to suggest multiple benefits of physical activity/exercise for pregnant women, including improved muscular strength and cardiovascular function; reduced rates of hypertension and pre-eclampsia; and reductions in pelvic and back pain, gestational weight gain, stress and depression, and delivery-related complications. Most ordinary physical activities such as walking, jogging, cycling and swimming are all considered safe. Activities generally considered unsafe include weight lifting, contact sports, sports with high risk of falling, sports with high changes in pressure (eg scuba diving), and altitude training.[16] Secondary prevention interventions for people with diabetes and both post-acute and stable CVD are also effective.[17,18] There have been eight Cochrane reviews on the benefits of exercise interventions for a range of other chronic conditions, including falls risk, depression, arthritis, back pain and other chronic pain conditions, all revealing mixed evidence of effectiveness and with limited high-quality studies on which to make any firm conclusions.[19]

Targeted interventions involving professional guidance and continued support can lead to moderate short- and mid-term increases in self-reported physical activity, achievement of a pre-determined level of physical activity and improved cardiorespiratory fitness.[20–22] It is important to note that although the evidence for these interventions is strong, there appears to be a substantial reduction in the effectiveness of those interventions when translating clinical, trial-based interventions into real-world settings, and few studies have examined the long-term impact of these interventions beyond 12 months.[22,23]

The specific components of successful interventions are difficult to discern owing to large heterogeneity in the types of interventions previously studied; however, primary care–based interventions seem to be beneficial without the need to refer to specific exercise or counselling services.[24–26] A World Health Organization (WHO) systematic review of 67 studies examining 29 primary care–based strategies concluded that the most effective interventions need to be moderately intensive and include three key components:[27]

1. At least one session involving a health-risk appraisal with a healthcare professional, with brief negotiation or discussion to decide on reasonable, attainable goals, and a follow-up consultation with trained personnel
2. Support with targeted information
3. Intervention linked to and/or coordinated with other stakeholders such as community sports organisations, ongoing mass media physical activity campaigns, and integration with social support measures (eg buddy system, contracts for exercise, group activities)[28]

The UK National Institute for Health and Care Excellence (NICE) has issued guidelines recommending against exercise referral programs for people who are sedentary or inactive in the absence of any other risk factors. They have recommended that policy makers only fund such programs for people with comorbid health conditions such as CVD or diabetes, where the program incorporates the elements similar to those listed above in the WHO review.[29]

Use of pedometers has been shown to lead to an absolute short-term increase in physical activity of around 2000–2500 steps per day, reductions in blood pressure and mild reductions in body mass index.[30] It is likely that the processes of engaging users and goal-setting are important factors in this potential positive benefit from pedometers.[30] Long-term effects, however, are not known.

The 2012–13 Aboriginal and Torres Strait Islander Health Survey included a pedometer study. Of the individuals (49%) who participated in using the pedometer, the average number of steps per day was 6963. The recommended daily steps for an adult is 10,000 or more; 17% of participants met this threshold.[9] Although there is much interest in the use of web and mobile interventions to increase physical activity and some trials have demonstrated positive outcomes, the current evidence base remains limited and no definitive conclusions can be made.[31,32] Similarly, the use of wearable devices as a means of promoting physical activity is of considerable interest given the surge in uptake of these devices on the market. The evidence base, however, is limited and early trials have demonstrated mixed results (both superiority and inferiority to standard treatments). Therefore, wearable devices cannot be recommended for routine use at this stage.[33,34]

Environmental policies targeting the built environment, in particular increased access to public transport, increased recreational space opportunities, reduction in environmental barriers to physical activity and point-of-decision prompts to increase use of stairs have been shown to be effective.[27,28] Facilities for sporting and recreational activities are lacking in many remote Aboriginal and Torres Strait Islander communities and surveys have reported that the need for such facilities is ranked as a high priority among community members.[35] Health promotion strategies in the school and workplace are also effective in increasing physical activity,[27,28] but have not been well studied in Aboriginal and Torres Strait Islander community settings.

The 2014 Australian physical activity and sedentary behaviour guidelines were informed by two systematic reviews on physical activity and sedentary behaviours for children and young adults and a 2012 commissioned report on developing new recommendations for adults aged 18–64 years.[36,37] These updated recommendations complement an existing discussion document developed for older Australians in 2006.[38] The recommendations are broadly similar to other international guidelines.[26,39] The rationale for changes in the adult guidelines are underpinned by the following statements (which are all level I–II, strength A–B statements):[36]

- The relationship between physical activity and health benefit is curvilinear. The greatest benefit is from moving from no activity to some activity, and there are increasing benefits from greater activity up to levels well beyond the current guideline recommendations.
- There is no clear evidence on the optimal frequency of physical activity, but there is strong support for recommending that adults should accumulate their physical activity across the week. Being active on most, if not all, days each week, is likely to provide increased metabolic benefits.
- The scientific data on the relationship between total volume (frequency x duration x intensity) of activity and health benefits are more convincing and consistent than those for frequency, duration or intensity of activity considered in isolation.
- For most health outcomes, additional benefits occur with more physical activity. In particular, more activity is required for prevention of weight gain and some cancers. This higher amount of physical activity can be achieved through longer duration (more minutes) or greater frequency (more often) or doing activities of higher intensity.
- Resistance training (muscle strengthening) activities are important for metabolic, cardiovascular and musculoskeletal health (including prevention of falls), and for maintaining functional status and ability to conduct activities of daily living.
- Although there is emerging evidence that extended sitting time is associated with increased risk of diabetes and all-cause mortality, there is insufficient evidence at the time of writing on the minimal or optimal duration of sitting and therefore no specific recommendations can currently be made.

Recommendations: Physical activity

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All people	Assess current level of physical activity and sedentary behaviours as per the Australian age-appropriate recommendations* (Box 1) Useful tools for assessment of physical activity include the UK General Practice Physical Activity Questionnaire (refer to 'Resources')	Opportunistic and as part of annual health assessment	IA	26, 36–38, 40

Recommendations: Physical activity					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	All people	For patients who are insufficiently active, give targeted advice and written information. This should include the following: • Determine existing preferred physical activities and invite patients to propose new activities • Ask the patient the amount/ frequency of activity they feel is achievable and set activity goals aiming to achieve Australian guideline recommendations (Box 1) • Record these goals and provide patients with a written copy • Consider cognitive behavioural support and follow-up • Consider additional social support (eg buddy system, involvement in a group activity) • Encourage active transport, which means physical activity undertaken as a means of transport and not merely as a form of recreation For osteoporosis prevention, encourage regular weight-bearing and resistance exercise to maintain and increase bone density (refer to Chapter 5: The health of older people)	Opportunistic and as part of annual health assessment	IB	27, 36, 37, 40, 42
	Pregnant women	All women who are pregnant should be encouraged to participate in physical activity to the levels in the Australian guideline recommendations (Box 1)	During antenatal visits	IA	16
	People with diabetes	For sedentary people, a gradual introduction to initial low-intensity physical activity, with slow progressions in volume and intensity, is recommended Those on insulin should be given individualised advice on avoiding hypoglycaemia when exercising (eg adjustment of carbohydrate intake, reduction of insulin dose, and choice of injection site) Consider referral to an exercise program for coaching if facilities are available	Opportunistic and as a part of annual diabetes assessment	GPP	29, 43, 44

Recommendations: Physical activity					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	People with cardiovascular disease (CVD) People with other chronic diseases, mental health issues and cancer survivors	Those with recent acute coronary syndrome event or revascularisation surgery (coronary artery bypass graft [CABG], percutaneous coronary intervention [PCI]) should be advised to participate in a short period (up to 12 weeks) of supervised exercise rehabilitation If the condition is well compensated and clinically stable, recommend commencing initial low-intensity physical activity with slow progressions in volume and intensity Consider referral to an exercise physiologist for coaching if facilities are available	Opportunistic	IA IIB	17, 18, 44 17, 18, 29
Environmental	All people	Refer to appropriate community-based physical activity programs and encourage use of public facilities that promote activity (eg advocate for increased availability of sports and recreational facilities in remote communities) Encourage health services to support physical activity by introducing practical measures such as walking meetings, provision of incentives for active transport, and making it easier for clients/staff to arrive by foot or bicycle Consider a range of social and contextual factors that may uniquely influence an individual's level of physical activity (refer to Chapter 1: Lifestyle, 'Overweight and obesity': Box 3)	Opportunistic	IB	45–47

***Moderate physical activity:** Activity at a level that causes your heart to beat faster and some shortness of breath, but that you can still talk comfortably while doing. **Vigorous physical activity:** Activity at a level that causes your heart to beat a lot faster and shortness of breath that makes talking difficult between deep breaths – that is, physical activity at a heart rate of 70–85% of maximum heart rate (MHR). MHR is calculated as 220 minus age.

Box 1. The Australian physical activity and sedentary behaviour guidelines – Recommendations by age group[40]

Age group	Recommendation
Aged <5 years	**Physical activity** For health development in infants (aged 0–1 year), physical activity – particularly supervised floor-based play in safe environments – should be encouraged from birth. Toddlers (aged 1–3 years) and pre-schoolers (aged 3–5 years) should be physically active every day for at least three hours, spread throughout the day. **Sedentary behaviour** Children younger than two years of age should not spend any time watching television or using other electronic media (DVDs, computer and other electronic games). For children aged 2–5 years, sitting and watching television and the use of other electronic media (DVDs, computer and other electronic games) should be limited to less than one hour per day. Infants, toddlers and pre-schoolers (all children aged 0–5 years) should not be sedentary, restrained, or kept inactive for more than one hour at a time, with the exception of when sleeping.
Aged 5–12 years	**Physical activity** For health benefits, children aged 5–12 years should accumulate at least 60 minutes of moderate to vigorous intensity physical activity every day. Children's physical activity should include a variety of aerobic activities, including some vigorous intensity activity. On at least three days per week, children should engage in activities that strengthen muscle and bone. To achieve additional health benefits, children should engage in more activity – up to several hours per day. **Sedentary behaviour** To reduce health risks, children aged 5–12 years should minimise the time they spend being sedentary every day. To achieve this: • limit use of electronic media for entertainment (eg television, seated electronic games and computer use) to no more than two hours a day – lower levels are associated with reduced health risks • break up long periods of sitting as often as possible.
Aged 13–17 years	**Physical activity** For health benefits, young people aged 13–17 years should accumulate at least 60 minutes of moderate to vigorous intensity physical activity every day. Young people's physical activity should include a variety of aerobic activities, including some vigorous intensity activity. On at least three days per week, young people should engage in activities that strengthen muscle and bone. To achieve additional health benefits, young people should engage in more activity – up to several hours per day. **Sedentary behaviour** To reduce health risks, young people aged 13–17 years should minimise the time they spend being sedentary every day. To achieve this: • limit use of electronic media for entertainment (eg television, seated electronic games and computer use) to no more than two hours a day – lower levels are associated with reduced health risks • break up long periods of sitting as often as possible.

Box 1. The Australian physical activity and sedentary behaviour guidelines – Recommendations by age group[40] (continued)

Age group	Recommendation
Aged 18–64 years	**Physical activity** Doing any physical activity is better than doing none. If you currently do no physical activity, start by doing some, and gradually build up to the recommended amount. Be active on most, preferably all, days every week. Accumulate 150 to 300 minutes (2½ to 5 hours) of moderate intensity physical activity or 75 to 150 minutes (1¼ to 2½ hours) of vigorous intensity physical activity, or an equivalent combination of both moderate and vigorous activities, each week. Do muscle strengthening activities on at least two days each week. **Sedentary behaviour** Minimise the amount of time spent in prolonged sitting. Break up long periods of sitting as often as possible.
Aged ≥65 years	Older people should do some form of physical activity, no matter what their age, weight, health problems or abilities. Older people should be active every day in as many ways as possible, doing a range of physical activities that incorporate fitness, strength, balance and flexibility. Older people should accumulate at least 30 minutes of moderate physical activity on most, preferably all, days. Sedentary people may need to gradually build up to 30 minutes or more. Older people who have stopped physical activity, or who are starting a new physical activity, should start at a level that is easily manageable and gradually build up to the recommended amount, type and frequency of activity. Older people who continue to enjoy a lifetime of vigorous physical activity should carry on doing so in a manner suited to their capability into later life, provided recommended safety procedures and guidelines are adhered to.

Resources

Assessment of physical activity

- Department of Health, UK, General Practice Physical Activity Questionnaire, www.gov.uk/government/publications/general-practice-physical-activity-questionnaire-gppaq

Heart Foundation

- Physical activity fact sheet for Aboriginal and Torres Strait Islander communities, https://heartfoundation.org.au/images/uploads/publications/NAHU-Physical-activity.pdf
- How to be active as a family, information sheet, https://heartfoundation.org.au/images/uploads/publications/PA_Tips.pdf
- Sitting less:
  - Adults, www.heartfoundation.org.au/images/uploads/publications/PA-Sitting-Less-Adults.pdf
  - Children, www.heartfoundation.org.au/images/uploads/publications/PA-Sitting-Less-Child.pdf
- Increasing Aboriginal and Torres Strait Islander participation in cardiac rehabilitation, www.heartfoundation.org.au/images/uploads/main/Cardiac_rehab_INF-082-P_6__factsheet.pdf

Department of Health/Department of Health and Ageing

- Girls make your move, https://campaigns.health.gov.au/girlsmove/get-started
- Caring for kids staff resource, www.health.gov.au/internet/main/publishing.nsf/Content/CAE59058071BEF98CA257BF0001A8E48/$File/Staff%20Handbook.pdf

- Physical activity for families, www.health.gov.au/internet/main/publishing.nsf/Content/F01F92328EDADA5BCA257BF0001E720D/$File/brochure%20PA%20Guidelines_A5_Families.PDF

Other

- Australian Diabetes Council, Physical activity and diabetes, http://diabetesnsw.com.au/wp-content/uploads/2014/12/ATSI-12-Physical-activity-and-diabetes.pdf
- Better Health Channel, Aboriginal health – Barriers to physical activity, www.betterhealth.vic.gov.au/health/healthyliving/aboriginal-health-barriers-to-physical-activity

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Alcohol

Background

Consumption of harmful quantities of alcohol is a leading risk factor contributing to global disease burden and is associated with over 200 diseases and injuries, particularly dependence, liver cirrhosis, cancer and both accidental and non-accidental injury.[1] Alcohol consumption is associated with the majority of disease burden from road traffic accidents and with social problems such as aggression and violence, family breakdown and child abuse or neglect.[2] Consequentially, alcohol-related harm is not merely a relevant issue for individual drinkers but also affects families and the broader community.[1]

While alcohol consumption at any level may increase the risk of ill-health and injury (Box 1), there are some reported benefits from low-level consumption for some conditions and in some population subgroups; however, this remains a controversial topic of much debate.[3] Habitual low-level daily drinking (one standard drink for women, two standard drinks for men) is associated with reductions in all-cause mortality, diabetes, coronary artery disease and stroke in certain age groups, but this is when comparing regular low-level drinking with heavy episodic (or binge) drinking.[4] Low-level drinking has been associated with slightly increased risk of breast cancer;[5] however, at high-risk levels, the chance of harm increases exponentially, particularly for all-cause mortality, cardiovascular diseases including non-ischaemic cardiomyopathy, atrial fibrillation, a variety of cancers[6] and both ischaemic and haemorrhagic stroke. It is therefore not recommended for healthcare professionals to actively advise low-level alcohol consumption given its strong potential for alcohol dependence even in low-risk individuals.

Surveys in the US have shown alcohol consumption in young people aged 9–18 years is common, with reported use of alcohol increasing ten-fold from 7% of 12-year-olds to 70% of 18-year-olds.[7,8] Drinking in adolescence is associated with increased risk of injury and high-risk health behaviours, such as unprotected sex. It is also a risk factor for suicide and for dependency later in life.[9] Alcohol use in Australian young people is correlated with the number of licensed outlets in the area.[10] The prevalence of drinking in this age group is often underestimated and consequentially undetected,[9] emphasising the importance of routinely screening for alcohol consumption in primary care settings. There are currently no validated age-appropriate screening tools. However, recent development of web-based and smart-phone screening and intervention applications may be useful in these age groups.[11] It is important to note that hazardous adolescent use of alcohol may be associated with psychosocial and intergenerational trauma.[12]

Aboriginal and Torres Strait Islander people are less likely than the general Australian population to drink, but the prevalence of harmful drinking and alcohol-related morbidity and mortality is much greater. In 2012–13, 28%[13] of Aboriginal and Torres Strait Islander adults had not consumed alcohol in the previous 12 months, compared with 15% of non-Indigenous adults; however, Aboriginal and Torres Strait Islander adults are twice as likely to binge drink compared to non-Indigenous adults (17% versus 8%).[14] In 2014–15, 14.7% of Aboriginal and Torres Strait Islander people exceeded the lifetime risk guidelines for alcohol consumption, versus 17.5% of non-Indigenous people.[15,16] Within the Aboriginal and Torres Strait Islander population there is a high association between alcohol consumption and contact within the criminal justice system, especially for males; those males who exhibited high-level/risky alcohol consumption are 29% more likely than those with low-level alcohol consumption to have been arrested in the previous five years.[16,17]

Alcohol crosses the placenta and can cause harm to a developing fetus, therefore current guidelines recommend no level of drinking is safe in the peri-conception period, during pregnancy or when breastfeeding.[18,19] Alcohol use in pregnancy is associated with a range of behavioural disorders and fetal alcohol spectrum disorder (refer to Chapter 3: Child health, 'Fetal alcohol spectrum disorder'). Despite the potential harms from alcohol consumption during pregnancy, survey data suggest it is common.[20] In 2014–15, 9.8% of Aboriginal and Torres Strait Islander mothers drank alcohol during pregnancy, although this had decreased substantially from previous surveys (eg 19.6% in 2008). Overall, 56% of Australian women reported drinking during pregnancy, and 26% of these continued to drink after becoming aware of the pregnancy.[21] A recent review suggested an inefficiency in current public health methods to tackle alcohol use during pregnancy, and recommended that further research, particularly in the field of public health evaluation of current methods, is required.[22]

Interventions

The Australian guidelines are currently being revised, but four existing recommendations are outlined in Box 1. There is strong evidence for screening in primary care to identify individuals consuming risky levels of alcohol, using quantity–frequency estimates. Combined with brief intervention, this technique has been associated with decreased alcohol consumption by an average of four standard drinks per week.[23,24] Brief interventions have been shown to be effective in patients with unhealthy drinking patterns, but there is little evidence for effectiveness in those with dependence.[25] For those patients, more intensive intervention is usually required.

Brief interventions include methods such as those highlighted in the FLAGS (Feedback, Listen, Advice, Goals, Strategy) framework for brief intervention (Box 2); these are most appropriate and effective in non-dependent drinkers who are drinking at risky levels.[26] Screening and brief intervention has a strong evidence base and in addition to environmental primary prevention measures such as reducing the availability and accessibility of alcohol, is the most effective method for decreasing an individual's alcohol consumption.[18,27] Screening in primary care settings can, importantly, detect those whose current drinking places them at increased risk of morbidity and mortality.[28] Barriers for screening and brief interventions include lack of confidence/knowledge from healthcare workers, lack of organisational support and financial incentive, and perceived patient embarrassment/discomfort with discussing alcohol.[29] Despite this, studies have shown that patients are generally accepting of their doctor enquiring about alcohol consumption. Furthermore, training may assist health workers with gaining more confidence and knowledge surrounding brief interventions. The FLAGS framework (Box 2) is recommended by The Royal Australian College of General Practitioners (RACGP) as part of the management of problematic drinking.[30]

Given alcohol-related harm tends to present late, systematic screening is recommended. There remains no clear evidence regarding the optimal frequency of screening for Aboriginal and Torres Strait Islander people. Screening can be performed via a simple patient history as part of routine consultation, or using brief questionnaires as an aid. The recommended and most sensitive of the screening tools is the Alcohol Use Disorders Identification Test (AUDIT) tool (refer to 'Resources'), which assesses level of drinking, dependency and experience of harm.[31,32] The AUDIT-C tool provides a shorter version for circumstances where time is limited. Neither tool has been specifically, nor reliably, validated in the Aboriginal and Torres Strait Islander populations. However, some studies have demonstrated their value[33,34] and currently they are the most commonly used tools in this population.[35] Using AUDIT-C, it is recommended that those who reach a cut-off score of equal to or greater than 5 are deemed to be 'at risk', those with a score equal to or greater than 6 'high risk', and those with a score equal to or greater than 9 are potentially alcohol dependent.[33]

Alternatively, the Indigenous Risk Impact Screen (IRIS) (refer to 'Resources') tool can be used. It comprises 13 questions designed to assist in identifying drug and alcohol problems, along with mental health risks, in Aboriginal and Torres Strait Islander people.[36] The IRIS tool has proven to be consistent with other screening tools such as AUDIT and is recommended as a brief screening tool for use with the Aboriginal and Torres Strait Islander people.[28,37]

The CAGE tool has been used in many Aboriginal and Torres Strait Islander health settings to screen for hazardous drinking, but has been reported to have very low sensitivity for detecting risky or hazardous drinking.[38] According to the Agency for Healthcare Research and Quality in the US, it is not recommended as a screening test for identifying risky or hazardous drinking or for screening for the full spectrum of alcohol misuse.[31] Measures such as liver function tests should not be relied on as a primary screen for alcohol dependency and should only be used as adjuncts owing to their low sensitivity and specificity.[18]

Positive outcomes when tackling risky drinking in Aboriginal and Torres Strait Islander populations are more likely to be attained if screening and interventions are delivered in a respectful, non-judgemental and culturally appropriate manner.[39] Current alcohol screening and intervention techniques need to be adapted for use in Aboriginal and Torres Strait Islander populations, rather than simply transferred; this involves collaboration and partnerships with communities, in the setting of community control.[39,40]

Effective alcohol management programs (AMPs) have an important role to play in reducing alcohol-related harms, and they do not merely restrict alcohol sales. AMPs are more likely to be successful when they are introduced voluntarily and led by Aboriginal and Torres Strait Islander agencies. They should be fully implemented and comprehensive, and should include a number of activities and resources to support individuals and communities to build capacity and make meaningful changes.[41]

Community engagement and control, particularly for Aboriginal and Torres Strait Islander peoples, has been shown to be an effective prevention method, along with harm reduction strategies such as community patrols and sobering-up shelters.[42] It is important to note that informal communication and counselling methods such as 'yarning' are highly valued in Aboriginal and Torres Strait Islander communities.[43] Imposed programs to address alcohol consumption, such as having alcohol-managed communities, have not proven effective in tackling problem drinking in Aboriginal in Torres Strait islander populations in Queensland; indeed, there have been unintended effects of binge drinking and cannabis use observed.[42,44,45]

There is emerging evidence surrounding the benefits of using modern technologies such as text messaging, phone counselling and online resources as health promotion, screening and intervention tools. Young Aboriginal and Torres Strait Islander people have expressed a preference for use of technologies as a contact method for formal help-seeking services.[43] Studies in other populations have shown that text message interventions can reduce alcohol consumption in young adults.[46]

Recommendations: Alcohol

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All people aged ≥15 years	Ask about the quantity and frequency of alcohol consumption to detect risky/high-risk drinkers (Box 1)	During the annual health assessment or in response to potential alcohol-related disease	IA–IB	7, 47
		More frequent assessment is recommended for high-risk groups (Box 3)	Opportunistic and as part of annual health assessments	I–IIIB	47
		Use structured questionnaires such as Alcohol Use Disorders Identification Test (AUDIT), AUDIT-C* or Indigenous Risk Impact Screen (IRIS) to assess drinking (refer to 'Resources'; note that these tools may require some adaptation to local community needs)	As part of an annual health assessment, or opportunistic	IA–IB	18, 39, 48
	People aged 10–14 years	Consider sensitive and age-appropriate alcohol intake screening in children and adolescents between the ages of 10 and 14 (refer to Chapter 4: The health of young people) Parental or carer involvement may be required and referral should be considered	As part of an annual health assessment or in response to potential alcohol-related disorders/other risky behavior	II	9, 11, 49
	People with risky or high-risk drinking levels	Review for comorbid physical or mental health disorders and other chronic disease risk factors Perform comprehensive alcohol assessment such as AUDIT-C and consider brief intervention. For those with dependence, consider specialist referral where necessary	As part of an annual health assessment	IA	18, 47, 50

Recommendations: Alcohol					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	People with hazardous and harmful drinking levels	Offer brief interventions for the reduction of alcohol consumption as first-line treatment. Consider using tools such as FLAGS and 5As approach (refer to Box 2 and Chapter 1: Lifestyle, 'Introduction') Note: Brief intervention alone is not sufficient for people with severe alcohol-related problems or alcohol dependence. Strongly consider more extended intervention and/or referral	Opportunistic and as part of an annual health assessment	IA	18, 47, 50
	Women who are pregnant, breastfeeding, seeking pre-conception counselling	Advise to abstain from alcohol, explain the risks to the unborn child and emphasise the benefits of not drinking (refer to Box 1 and 'Resources') Advise breastfeeding mothers abstinence from alcohol is the safest option, especially in the first month post-partum. For those choosing to drink, alcohol intake should be limited to no more than two standard drinks per day. Try to breastfeed before drinking. Continue to promote breastfeeding	Pregnant women – at all antenatal visits, as appropriate For all others, opportunistic screening as part of an annual health assessment	IA	18, 19, 22
Environmental		Promote community-led strategies to reduce alcohol supply, including advocacy for: • 'dry communities' in areas with high numbers of alcohol-related harms • restrictions to liquor licensing hours or changes to other licensing conditions • better, proactive policing of responsible service of alcohol • community development initiatives • initiatives to engage young people • school or classroom-based educational sessions		GPP	39, 51–53

*Using AUDIT-C, it is recommended that those who reach a cut-off score of equal to or greater than 5 are deemed to be 'at risk', those with a score equal to or greater than 6 'high risk', and those with a score equal to or greater than 9 are potentially alcohol dependent.[33]

Box 1. National Health and Medical Research Council (NHMRC) guidelines for safer alcohol use[19]

1. For healthy men and women, drinking no more than two standard drinks on any day reduces the lifetime risk of harm from alcohol-related disease or injury.
2. For healthy men and women, drinking no more than four standard drinks on a single occasion reduces the risk of alcohol-related injury arising from that occasion.
3. For children and young people under 18 years of age, not drinking alcohol is the safest option.
   a) Parents and carers should be advised that children under 15 years of age are at the greatest risk of harm from drinking and that for this age group, not drinking alcohol is especially important.
   b) For young people aged 15–17 years, the safest option is to delay the initiation of drinking for as long as possible.
4. Maternal alcohol consumption can harm the developing fetus or breastfeeding baby.
   a) For women who are pregnant or planning a pregnancy, not drinking is the safest option.
   b) For women who are breastfeeding, not drinking is the safest option.

Box 2. The FLAGS framework for brief intervention[18]

Feedback	• Provide individualised feedback about the risks associated with continued drinking, based on current drinking patterns, problem indicators and health status. • Discuss the potential health problems that can arise from risky alcohol use.
Listen	• Listen to the patient's response. • This should spark a discussion of the patient's consumption level and how it relates to general population consumption and any false beliefs held by the patient.
Advice	• Give clear advice about the importance of changing current drinking patterns and a recommended level of consumption. • A typical five-minute to 10-minute brief intervention should involve advice on reducing consumption in a persuasive but non-judgemental way. • Advice can be supported by self-help materials, which provide information about the potential harms of risky alcohol consumption and can provide additional motivation to change.
Goals	• Discuss the safe drinking limits and assist the patient to set specific goals for changing patterns of consumption. • Instil optimism in the patient that his or her chosen goals can be achieved. • It is in this step, in particular, that motivation-enhancing techniques are used to encourage patients to develop, implement and commit to plans to stop drinking.
Strategies	• Ask the patient to suggest some strategies for achieving these goals. • This approach emphasises the individual's choice to reduce drinking patterns and allows them to choose the approach best suited to their own situation. • The individual might consider setting a specific limit on alcohol consumption, learning to recognise the antecedents of drinking, and developing skills to avoid drinking in high-risk situations, pacing one's drinking and learning to cope with everyday problems that lead to drinking.

Box 3. High-risk groups that require more frequent screening and close attention

- Adolescents and young adults
- Pregnant women/those planning pregnancy
- Illicit drug users/other substance misusers
- Those with a family history of alcohol dependence
- People with mental illness
- Those with medical conditions that may be worsened by alcohol consumption; conditions include:
  - cardiovascular disease (CVD)
  - arrhythmia
  - liver disease
  - diabetes
  - hypertension

Resources

- Alcohol Use Disorders Identification Test (AUDIT) tool, http://at-ease.dva.gov.au/professionals/files/2012/12/Audit-AUDIT-Tool.pdf
- Brief intervention resources:
  - Brady M, Hunter E. *Talking about alcohol with Aboriginal and Torres Strait Islander patients*. 3rd edn. Canberra: Department of Health and Ageing, 2009 (a flipchart that includes tear-off prescription pads), www.healthinfonet.ecu.edu.au/key-resources/promotion-resources?lid=14793
  - Lee K, Freeburn B, Ella S, Miller W, Perry J, Conigrave K, editors. *Handbook for Aboriginal alcohol and drug work*, Sydney: University of Sydney, 2012, http://sydney.edu.au/medicine/addiction/indigenous/resources
- Center for Quality Assessment and Improvement in Mental Health, AUDIT-C tool, www.cqaimh.org/pdf/tool_auditc.pdf
- Department of Health, Australian Standard drink definition and calculator, www.health.gov.au/internet/alcohol/publishing.nsf/Content/standard
- Department of Health, Information for health professionals assessing alcohol consumption in pregnancy using AUDIT-C, www.alcohol.gov.au/internet/alcohol/publishing.nsf/Content/wwtk-audit-c
- Haber P, Lintzeris N, Proude E & Lopatko O. *Quick reference guide to the treatment of alcohol problems: Companion document to the guidelines for the treatment of alcohol problems*. Canberra: Department of Health and Ageing, 2009, http://alcohol.gov.au/internet/alcohol/publishing.nsf/Content/864FDC6AD475CB2CCA257693007CDE3A/$File/treatqui.pdf
- National Health and Medical Research Council, guidelines for safer alcohol use, www.nhmrc.gov.au/_files_nhmrc/publications/attachments/ds10-alcohol.pdf
- Queensland Health, Indigenous Risk Impact Screen (IRIS), www.health.qld.gov.au/atod/prevention/iris.asp

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Gambling

Background

Gambling is defined as 'an entertainment based on staking money on uncertain events driven by chance'.[1] Popular gambling activities in Australia include lotteries and lotto, electronic gaming machines (EGMs; poker machines or 'pokies'), wagering on horse or dog racing, keno, bingo, sports betting, and betting on card games. Gambling is common in Australia, with 70–80% of Australian people reporting they have gambled at least once in the past year,[2,3] and 64% reporting participation in commercial forms of gambling.[4] Total annual gambling expenditure in Australia in 2014–15 was an estimated $22 billion, with 50% of these losses being from poker machines, and gambling expenditure from sports betting increased by 30% between 2013–14 and 2014–15.[5]

Aboriginal and Torres Strait Islander people participate in a range of gambling activities, and many are regular gamblers.[4] Of Aboriginal and Torres Strait Islander people who participate in gambling on EGMs, sports betting, online casinos and race wagering, an estimated 40% gamble weekly.[6]

Card game gambling has long been a part of community life in many Aboriginal and Torres Strait Islander communities,[4] and some gamblers sustain significant losses. Participation and frequency of card game gambling is declining in some urban areas and has been replaced by commercial gambling in some regions.[4] Gambling on poker machines is a common activity for both men and women and is often the highest spending gambling activity among Aboriginal and Torres Strait Islander peoples.[4]

Some people who gamble will experience negative impacts from their gambling. 'Problem gambling' has been defined as 'difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others or for the community'.[2] A range of tools have been developed to assess whether individuals are 'problem gamblers',[2] and estimates of the prevalence of problem gambling will depend critically on which tools are used. An estimated 1–3% of the Australian population are problem gamblers,[2,3] with lower rates in Western Australia where there are no poker machines in clubs or hotels.[2] Approximately 75–80% of problem gambling is associated with the use of poker machines, and problem gamblers contribute 40% of all gambling losses on poker machines.[2] It has been estimated that one person with problem gambling will have negative impacts on an average of five to 10 other people.[1]

Available evidence suggests that up to one in five Aboriginal and Torres Strait Islander people may have gambling problems,[4] and that problem gambling can have serious consequences for individuals, families and communities.[7–9] Negative impacts of problem gambling for Aboriginal and Torres Strait Islander peoples are similar to those for other population groups, and can include financial hardship, relationship breakdown, social and emotional difficulties, substance misuse, impacts on employment and contact with the criminal justice system.[7,8] Problem gambling is highly associated with depression, anxiety, suicidal ideation and substance misuse.[2,10]

Environmental risk factors for problem gambling include the cultural and social normalisation of gambling, exposure to peer and family gambling and introduction to gambling at an early age.[11–13] Children whose parents and/or siblings have issues with problem gambling or substance abuse are at higher risk of becoming problem gamblers.[14] Adolescents who gamble are at particularly high risk for problem gambling, with problem gambling behaviours at two to three times the rate of adults who gamble.[11,12] There is limited information on the early identification of adolescents with gambling problems.[12] Warning signs of adolescent problem gambling include multiple visits to internet gaming sites, use of instant lottery tickets, excessive interest in sports events and significant unexplained monetary outlays.[13] Family cohesiveness and school connectedness may protect adolescents from problem gambling.[13]

Interventions

Interventions to reduce harms caused by gambling can involve a broad group of stakeholders, including government, industry and community.[2,7,14,15] Public health approaches to address problem gambling promote structural interventions, such as safety controls for technology-based gambling and prevention of access

to instant lottery tickets for those under 18 years. Such interventions may help reduce both the uptake of gambling and harms from gambling.[13,16–18]

The goal of primary prevention activities for gambling is to encourage responsible and non-harmful gambling activities among people who choose to gamble.[14] In Aboriginal and Torres Strait Islander communities, interventions to reduce harms from gambling are more likely to be effective if they include attention to the social, cultural and environmental context of gambling; take into account individual community needs; and promote whole-of-community health.[7,9] Community education that focuses on the risks of gambling, including negative impacts on children, and the recognition and availability of support and assistance for problem gambling, may be useful.[4]

Australian clinical guidelines published in 2011 provide guidance on the identification and treatment of problem gambling.[3] Screening for problem gambling in the general population has been promoted to GPs and other primary healthcare practitioners, because primary healthcare settings provide a good opportunity for identifying people with, or affected by, problem gambling and linking them to support and treatment services.[16,19] Primary care workers may become more confident and effective at detecting problem gambling through recognising that people with gambling problems may present with stress-related medical disorders or other symptoms, and that problem gambling is commonly associated with other health problems including substance abuse and mental health disorders.[16–18] It is also important to note that shame and stigma may prevent Aboriginal and Torres Strait Islander people from accessing help for gambling-related problems.[7]

A range of tools have been developed to identify and characterise problem gambling, although only a few are appropriate for screening people for problem gambling in primary healthcare settings.[3,10,16,18] The 2011 Australian clinical guidelines about screening for and treating problem gambling included a review of available screening and diagnostic tools for problem gambling, and recommended three brief screening tools as suitable for use in primary care settings – the Brief Bio-social Gambling Screen (BBGS), the Lie-Bet Questionnaire, and NODS-CLiP.[3] The guidelines noted the successful use of a medium-length assessment tool, the EIGHT questionnaire, in general practice settings,[20] and a subsequently published study explored the adaptation of the nine-item Problem Gambling Screening Index (PGSI) to assess the prevalence of problem gambling in Aboriginal and Torres Strait Islander populations.[21]

A simple question about whether a person is experiencing problems with their gambling may be as effective as more complex tools and may be more appropriate for primary care screening.[18] A tool designed to help Aboriginal Community Controlled Health Service (ACCHS) staff identify people who could benefit from information, support and referral about gambling was piloted in New South Wales in 2010.[22] Using this tool, ACCHS staff were encouraged to ask attendees if they or someone they were close to had issues with gambling, and to offer information and support. A pilot of the screening tool, and resources to support staff with responses and referrals, was positively evaluated by staff at participating ACCHSs in terms of acceptability and usefulness.[23]

More research is needed into screening and intervention for adolescents who gamble.[24] Most current research has been conducted in the context of school-based interventions.[24] Given gambling behaviours can begin at approximately 12 or 13 years of age, preventive interventions, such as school-based strategies educating youth on basic principles of gambling, should begin before then.[14,25] Increasing the awareness of teachers, parents and healthcare professionals in recognising adolescent gambling may assist in the identification of at-risk adolescents.[13]

Systematic reviews and randomised controlled trial evidence provide some support for the effectiveness of psychological therapies for problem gambling, including cognitive behaviour therapy and motivational interviewing.[3,26–28]

Aboriginal and Torres Strait Islander health services can contribute to improving the detection and management of problem gambling in their communities by training their staff to identify and respond to gambling issues, and by strengthening referral pathways between their health service and local gambling support and treatment services.[7]

Recommendations: Gambling					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	All people aged >12 years	Ask clients if they participate in gambling activities (eg 'pokies', cards, roulette, blackjack and other table gambling, lotteries, sport-associated gambling, online gambling) Screen for problems by asking a single-item question such as: 'Have you or someone you are close to ever had issues with gambling?'	Opportunistic and as part of an annual health assessment	GPP	3, 7, 10, 16, 18, 23
	Young people aged 12–24 years	Consider screening young people for gambling behaviours as part of general screening tools such as HEADSS (refer to Chapter 4: The health of young people)		GPP	13
	High-risk groups such as people with stress-related medical problems, young people or adults with mental health or substance use problems	All adults in high-risk groups should be screened for problem gambling using the single-item question Consider use of a validated measurement tool for problem gambling (refer to 'Resources')		GPP	3
	Children with parents/siblings who are known to have problem gambling	Assess the impact of family gambling on children, through assessing child nutrition and growth, and physical and psychosocial health and wellbeing (refer to Chapter 3: Child Health, 'Growth failure', and Chapter 4: The health of young people)	Opportunistic	GPP	13, 14
Behavioural	All people identified with problem gambling	Management options for problem gambling include: • brief treatments and motivational interviewing aimed at promoting behaviour change • cognitive behavioural therapy • treatment of co-existing and complicating factors such as depression and substance abuse • referral to gambling support helplines and websites (refer to 'Resources') • referral to gambling treatment centres, financial counselling and support, legal support services	Opportunistic	GPP	10, 13, 16–18
Environmental	Young people aged ≥12 years	Where appropriate, engage with local school authorities and support implementation of school-based gambling prevention strategies Encourage teachers, parents and healthcare professionals to be more aware of adolescent gambling		IIIB	13, 14, 25, 29
	Community	Adopt or support community-focused activities (eg community campaigns) that promote strategies to control gambling and reduce related harms		GPP	1, 4, 7, 9

Resources

- Gambling Help Online, online counselling, information and support service for problem gambling issues. Includes contact details for local face-to-face counselling and support, www.gamblinghelponline.org.au
- Monash University, Problem Gambling Research and Treatment Centre (PGRTC), 'Guideline for screening, assessment and treatment in problem gambling', www.med.monash.edu.au/sphc/pgrtc/guideline/index.html
- National telephone counselling services:
  - Gambling Helpline, 1800 858 858
  - National Debt Helpline, 1800 007 007

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Chapter 2: Antenatal care

Introduction

Antenatal care aims to improve health and prevent disease for both the pregnant woman and her baby. While many Aboriginal and Torres Strait Islander women have healthy babies, poor maternal health and social disadvantage contribute to higher risks of having problems during pregnancy and an adverse pregnancy outcome.[1,2] The reasons for these adverse outcomes are complex and multifactorial (Figure 1), and together with other measures of health disparity provide an imperative for all involved in caring for Aboriginal and Torres Strait Islander women to ensure they receive the highest quality antenatal care, and, in particular, care that is woman-centred, evidence-based and culturally competent.

This chapter reflects recommendations for Aboriginal and Torres Strait Islander women from two modules of Australian evidence-based antenatal care guidelines[3,4] and incorporates new evidence published subsequently.

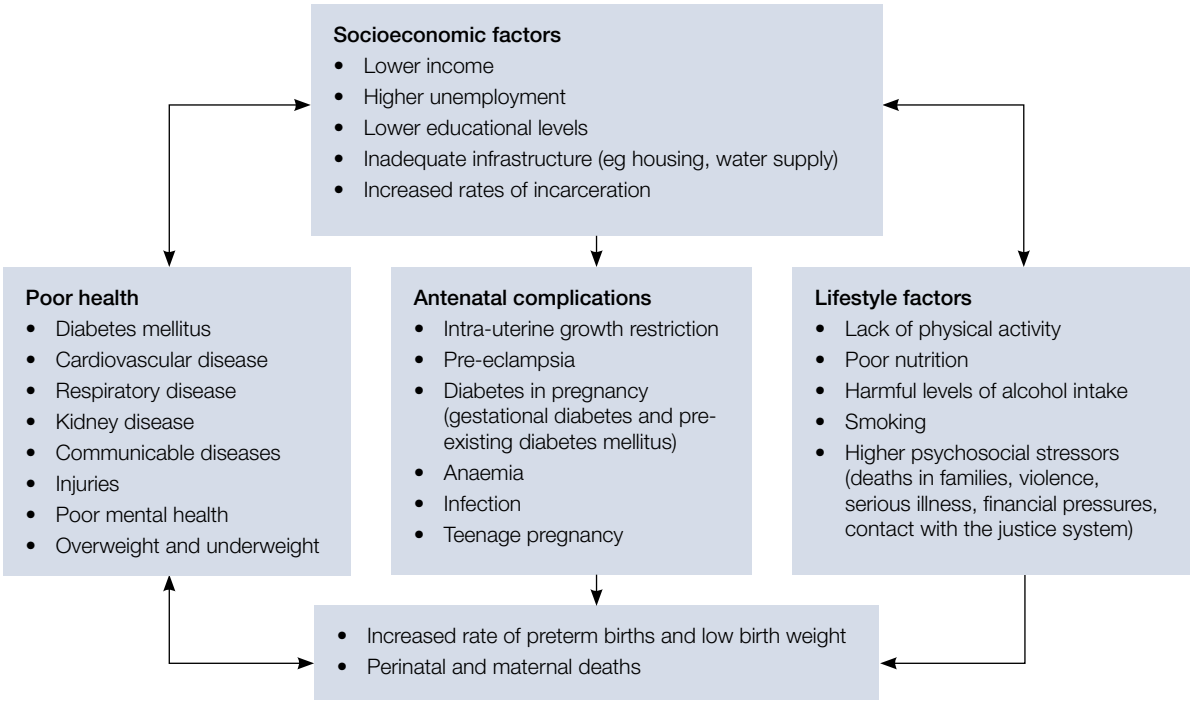
For selected antenatal care topics, narrative summaries of evidence relevant to Aboriginal and Torres Strait women are presented below. These are:

- smoking
- screening for genitourinary and blood-borne viral infections
- nutrition and nutritional supplementation
- diabetes.

Recommendations for other key elements of antenatal care to be provided at the first antenatal care visit and at subsequent visits are summarised in 'Recommendations: Summary of other antenatal care screening and activities'.

The prevention of fetal alcohol spectrum disorder (FASD) is covered in a separate chapter of the guide (refer to Chapter 3: Child health, 'Fetal alcohol spectrum disorder').

Figure 1. Factors that influence pregnancy outcomes in Aboriginal and Torres Strait Islander women[5]



Reproduced from Clarke M, Boyle J. Antenatal care for Aboriginal and Torres Strait Islander women. Aus Fam Physician 2014;43(1/2):20–24.

Antenatal care – General features

Antenatal care includes providing support, information and advice to women during pregnancy, undertaking regular clinical assessments, and screening for a range of infections and other conditions as well as following up and managing screen-detected problems.[4] The key feature of high-quality antenatal care for all women is that it is woman-centred,[4] meaning care that includes:

- focusing on each woman's individual needs, expectations and aspirations, including her physical, psychological, emotional, spiritual, social and cultural needs
- being culturally safe
- supporting women to make informed choices and decisions
- involving the woman's partner, family and community, as identified by the woman herself.

High-quality antenatal care for Aboriginal and Torres Strait Islander women includes holistic care that is consistent with the Aboriginal definition of health, being the physical, social, emotional and cultural wellbeing of both an individual and their community.[6]

Aboriginal and Torres Strait Islander women are cared for by a range of health professionals during pregnancy, and the cultural competence of healthcare providers is of critical importance to women's engagement with antenatal care and the delivery of high-quality care. Healthcare providers need an awareness of the higher levels of social and economic disadvantage experienced by many Aboriginal and Torres Strait Islander people and to prioritise doing what they can to address these social determinants of health at both individual and system levels.[7] Building trust, and respectful communication and developing effective therapeutic relationships are also key features of providing high-quality antenatal care to Aboriginal and Torres Strait Islander women.[8]

In Australia, antenatal care is delivered in a range of organisational settings including hospitals, general and specialist private practices, government clinics, and Aboriginal Community Controlled Health Services. The involvement of Aboriginal and Torres Strait Islander people in the delivery of care, and in the design and management of services, will improve the quality of care for Aboriginal and Torres Islander women in all settings.[4]

The 'first visit' is an important focus in antenatal care, as provision of advice and a range of assessment and screening activities is best undertaken early in pregnancy to maximise the benefits. It is recommended that the first antenatal care visit occurs before 10 weeks' gestation.[4] While there is some evidence of recent improvements, Aboriginal and Torres Strait Islander women are still less likely than other Australian women to receive antenatal care early in pregnancy.[1,9] According to age-standardised national data from 2014, 53% of Aboriginal and Torres Strait Islander women attended antenatal care in the first trimester, compared to 60% of non-Indigenous women, and among Aboriginal and Torres Strait Islander women first trimester attendance was higher for women in outer regional areas (62%) compared to women living in major cities (48%) or very remote areas (51%).[1] This suggests the need for ongoing attention by the healthcare system to promoting and facilitating early engagement of pregnant Aboriginal and Torres Strait Islander women, including strengthening cultural safety and addressing local barriers identified by Aboriginal and Torres Strait Islander women.

Current recommendations for antenatal care have shifted from a 'traditional' fixed schedule of visits towards a more flexible tailored plan of visits that is developed in consultation with each woman in early pregnancy and designed to meet her individual needs.[4] Ten antenatal care visits are recommended for a woman without complications having her first pregnancy, and seven visits for a woman having a subsequent pregnancy.[4]

Antenatal care frequently involves screening that aims to improve outcomes for the pregnant woman and her baby. For all screening conducted during pregnancy, women must be provided with information and an opportunity to ask questions about the tests and potential treatments beforehand, so that they are able to provide informed consent. Screening test results need to be communicated to women whether they are positive or negative, and appropriate management and follow-up of positive results is critical if the potential benefits of screening are to be realised.

Smoking

Smoking tobacco during pregnancy has a range of negative impacts on the health of women and babies. Adverse birth outcomes are more common among women who smoke during pregnancy and include an increased risk of preterm birth, low birthweight, and stillbirth. Children of women who smoked during pregnancy have higher rates of Sudden Infant Death Syndrome (SIDS), asthma, ear infections and respiratory infections. Quitting smoking before or during pregnancy can reduce these risks.

At a national level, an estimated 44% of Aboriginal and Torres Strait Islander women smoked during pregnancy in 2014.[1] The prevalence of smoking during pregnancy for Aboriginal and Torres Strait Islander women is decreasing (down from 52% in 2003[10]); however, it remains much higher than that of non-Indigenous women who are pregnant (12% in 2014). Smoking during pregnancy is more common among young women, those living in rural and remote areas, and those who experience socioeconomic disadvantage.[1] Factors associated with high smoking rates and low quit rates among Aboriginal and Torres Strait Islander populations include the normalisation of smoking within Aboriginal communities; the presence of social health determinants such as unemployment, poverty, removal from family, and incarceration; personal stressors such as violence, grief and loss; concurrent use of alcohol and cannabis; and lack of access to culturally appropriate support for quitting.[11–14] Aboriginal and Torres Strait Islander women have expressed the view that smoking during pregnancy can help them cope with stress and relieve boredom, and that quitting may be of lower priority compared to the many other personal and community problems they face.[15]

Pregnancy is a particularly opportune time for an intensive focus on the delivery of smoking cessation advice and support to women, because of the potential for improving the health of both mother and baby, and because women are more likely to quit smoking during pregnancy. Aboriginal and Torres Strait Islander women have indicated their support for receiving information, advice and support for quitting from caregivers during pregnancy.[16,17] Health professionals, therefore, have an important role to play in providing information and support to women during pregnancy. There is systematic review evidence that psychosocial interventions for smoking cessation during pregnancy are effective at increasing quit rates and improving birth outcomes such as low birthweight.[18] Only one randomised controlled trial has assessed the effectiveness of a tailored smoking cessation intervention for Aboriginal and Torres Strait Islander women.[19] It did not find a significant difference in quit rates between the intervention group and those receiving usual care, suggesting that more work is needed to optimise smoking cessation strategies in pregnancy for Aboriginal and Torres Strait Islander women.

All pregnant women should be asked about their smoking history and practices, and it is recommended that those who currently smoke or have recently quit be provided with information about the effects of smoking during pregnancy, advised to quit smoking and stay quit, and offered ongoing and tailored support to do so.[4] Efforts by health professionals to address smoking during pregnancy for Aboriginal women are more likely to be effective when relationships are non-judgemental, trusting and respectful, as well as empowering and supportive of women's self-efficacy and agency.[12,20] The social context of Aboriginal and Torres Strait Islander women's lives is very important to consider when designing and delivering smoking cessation advice and support during pregnancy; it has been suggested that addressing stressors, and building skills and coping strategies, are likely to increase the efficacy of smoking cessation efforts.[14,15] Involvement of partners and families, as well as community-wide efforts to denormalise and reduce smoking in Aboriginal communities, are also recommended as strategies to address smoking in pregnancy for Aboriginal and Torres Strait Islander women.

While evidence for the effectiveness of nicotine replacement therapies (NRT) during pregnancy is currently limited, trial results suggest NRT can have positive impacts on quit rates and child development outcomes, and there is no evidence of associated harms.[21] The use of NRT during pregnancy is recommended when initial quit attempts have not been successful, with preference being for the use of an intermittent mode of delivery (such as lozenges, gum or spray) rather than continuous (such as patches).[4] The safety of oral pharmacotherapies (such as buprenorphine and varenicline) and e-cigarettes, and their effectiveness as measures to support quitting during pregnancy, is not known and therefore they are not recommended for use.[21]

Screening for genitourinary and blood-borne infections

Urinary tract infections

Asymptomatic bacteriuria is common during pregnancy, and may be more common among Aboriginal and Torres Strait Islander women.[22–24] Ascending urinary tract infection during pregnancy may lead to pyelonephritis, and an association with preterm birth and low birth weight has been suggested.[4] A Cochrane review has demonstrated that treatment with antibiotics is effective at clearing asymptomatic bacteriuria during pregnancy, and results in a reduced risk of pyelonephritis as well as providing suggestive evidence about a reduced risk of adverse pregnancy outcomes such as preterm birth and low birthweight.[25]

All women should be routinely offered testing for asymptomatic bacteriuria early in pregnancy using a midstream urine culture.[4] Urine dipstick for nitrites is not a suitable test for diagnosing infection, as false positives are frequent; however, a negative dipstick result means infection is unlikely. Appropriate storage of dipsticks is essential, as high humidity and temperature can impact on their accuracy.

Chlamydia

Chlamydia is a common sexually transmitted infection (STI) that can be asymptomatic and can lead to pelvic inflammatory disease, infertility and ectopic pregnancy. Chlamydia infection during pregnancy has been associated with higher rates of preterm birth and growth restriction, and can result in neonatal conjunctivitis and respiratory tract infections.[4] Antibiotics are effective at treating chlamydia, and there is some evidence that treatment during pregnancy reduces the incidence of preterm birth and low birth weight.[26,27]

Chlamydia prevalence estimates for pregnant Aboriginal and Torres Strait Islander women vary from 2.9% to 14.4%.[30,31] Chlamydia is most common among young people, with 80% of diagnoses among Aboriginal and Torres Strait Islander people being in this group.[30] Notification rates for chlamydia are eight times higher for Aboriginal and Torres Strait Islander people living in remote regions.[30]

Australian national evidence-based antenatal care guidelines recommend that chlamydia testing is routinely offered during pregnancy at the first antenatal care visit to pregnant women aged less than 25 years, and to all women who live in areas where chlamydia and other STIs have a high prevalence.[4] Pregnant women who test positive to chlamydia, and their partners, need follow-up, assessment for other STIs and treatment.

Gonorrhoea

Gonorrhoea is a sexually acquired infection that can cause pelvic inflammatory disease and chronic pelvic pain in women. Gonorrhoea infection during pregnancy is associated with adverse outcomes including ectopic pregnancy, miscarriage, preterm birth and maternal sepsis during and after pregnancy.[4] Transmission at the time of birth can lead to neonatal conjunctivitis, which may cause blindness.

Gonorrhoea is most commonly diagnosed in young people, and is more common for Aboriginal and Torres Strait Islander people living in outer regional and remote areas.[30] Rates of diagnosis have been declining but remain high in these regions.[30]

Australian national evidence-based antenatal care guidelines recommend against screening all pregnant women for gonorrhoea, because there is a relatively low prevalence of disease and there is potential for harms associated with false positive test results, particularly in low-risk populations.[4] Screening for gonorrhoea is recommended for pregnant women who live in, or come from, areas of high prevalence (outer regional and remote areas), or who have risk factors for STIs. Pregnant women who test positive to gonorrhoea, and their partners, need follow-up, assessment for other STIs and treatment.

Trichomoniasis

Trichomoniasis is a sexually transmitted vaginitis that is commonly asymptomatic, but can cause a yellow–green vaginal discharge and vulval irritation, and may be associated with infertility and pelvic inflammatory disease.[3] The implications of trichomoniasis during pregnancy remain unclear; while an association between trichomoniasis and preterm birth and low birth weight has been demonstrated, evidence of a cause and effect relationship is currently lacking.[31]

The benefits of screening asymptomatic women for trichomonas during pregnancy are uncertain, because there is no evidence that antibiotic treatment improves pregnancy outcomes,[3,31] with one trial suggesting a higher rate of preterm birth among pregnant women who were treated for asymptomatic trichomoniasis with metronidazole.[31] For this reason screening of asymptomatic, pregnant women is not recommended.[3]

Bacterial vaginosis

Bacterial vaginosis (BV) is a deficiency of normal vaginal flora (Lactobacilli) and a relative overgrowth of anaerobic bacteria. BV occurs commonly and is often asymptomatic, although it can also cause a greyish vaginal discharge.[4]

In epidemiological studies, BV has been associated with a higher rate of preterm birth. While antibiotics for BV have been found to be effective at eradicating BV microbiologically, they have not resulted in a reduction in the preterm birth rate.[32] For this reason, routine screening of asymptomatic pregnant women for BV is not recommended.[4,32] Symptomatic women diagnosed with BV, however, should be treated.

Group B streptococcus

Group B streptococcus (GBS) is a bacteria that commonly colonises the gastrointestinal tract, vagina and urethra, and has the potential to increase the risk of preterm birth and cause serious neonatal infection after birth.[4] For women who are colonised with GBS, intravenous antibiotics during labour can prevent more than 80% of neonatal infection.[4]

Australian estimates suggest a prevalence of GBS colonisation among all pregnant women of around 20%.[4] Prevention strategies can involve two main approaches: antenatal screening for GBS in late pregnancy (at 35–37 weeks' gestation), or an assessment of risk factors for GBS transmission during labour (including preterm birth, maternal fever and prolonged rupture of membranes). As there is currently no clear evidence supporting one strategy over the other, Australian national evidence-based antenatal care guidelines recommend either strategy can be used.[4]

Syphilis

Syphilis is an STI with serious systemic sequelae. During pregnancy, syphilis can cause spontaneous miscarriage or stillbirth, or lead to congenital infection that is commonly fatal or results in severe and permanent impairment. Congenital syphilis can be prevented by effective treatment of maternal syphilis with antibiotics.[33]

In Australia, notifications of infectious syphilis have been declining but have remained more common for Aboriginal and Torres Strait Islander peoples compared to non-Indigenous populations.[30] However, since 2010 there has been a marked increase in notifications of infectious syphilis, driven by an outbreak in northern Australia, including Western Australia, the Northern Territory and Queensland.[34] This outbreak has included a total of 22 cases of congenital syphilis being notified nationally between 2011 and 2015, with 14 of these cases being Aboriginal and Torres Strait Islander babies,[30] and several infant deaths from syphilis have occurred. [34]

All pregnant women should be routinely offered testing to screen for syphilis at the first antenatal visit, and repeat screening later in pregnancy may be appropriate in regions of high prevalence.[4] The interpretation of syphilis serology can be complex. To ensure diagnosis, treatment and follow-up are consistent with evidence-based best practice, it is recommended that expert advice is sought if a pregnant woman tests positive for syphilis on an initial screen.[4]

HIV

While human immunodeficiency virus (HIV) infection is uncommon in Australia, screening during pregnancy for all women at the first antenatal visit is recommended because of the serious consequences of mother-to-child transmission and the availability of treatments effective at reducing this risk.[4] These treatments include caesarean section, short courses of selected antiretroviral medications, and the avoidance of breastfeeding. HIV infection currently occurs at similar rates for Aboriginal and Torres Strait Islander and non-Indigenous

population groups in Australia.[30] Women who test positive for HIV require careful and confidential follow-up, including repeat confirmatory testing, assessment and specialist management.

Hepatitis C

Hepatitis C is a blood-borne virus with the potential for causing serious long-term sequelae, including cirrhosis, hepatocellular carcinoma and liver failure through chronic infection. Hepatitis C infection is diagnosed up to four times more often among Aboriginal and Torres Strait Islander women than non-Indigenous women, and is increasing.[30] Perinatal transmission occurs for 4–6% of babies born to women who are positive to both hepatitis C antibody and hepatitis C RNA during pregnancy, and this risk is higher with increasing viral load.[4]

In recent years, the increased availability of effective anti-viral therapies with fewer adverse impacts than previously available treatments has greatly improved treatment options and outcomes for people with chronic hepatitis C infection.[35] However, at the time of writing, anti-viral therapies used for treating for hepatitis C are not approved or recommended for use during pregnancy.[35]

The lack of antenatal treatment options and the potential psychological harms associated with false positive results of screening tests are the main reasons that routine screening of all women for hepatitis C during pregnancy is not recommended.[4] Testing during pregnancy may be considered, however, for women with identifiable risk factors, including intravenous drug use, tattooing and body piercing, and incarceration.[4] If an initial hepatitis C antibody test is positive, a confirmatory hepatitis C RNA test is required to assess risks and guide management for the woman and baby, and both should be appropriately followed up.

Hepatitis B

Aboriginal and Torres Strait Islander populations have higher rates of diagnosis of hepatitis B infection than non-Indigenous population groups, and available evidence suggests this pattern is also true of hepatitis B surface antigen positivity during pregnancy.[30,36,37] All pregnant women should be offered screening for hepatitis B infection by testing for hepatitis B surface antigen at their first antenatal care visit, and those that test positive should be appropriately followed up.[4] Newborn children of women with current hepatitis B infection (hepatitis B surface antigen positive) can be vaccinated after delivery. Vaccination and the provision of immunoglobulin to the baby at birth is approximately 95% effective at preventing perinatal transmission.[4]

Nutrition and nutritional supplementation

Nutrition

Good nutrition during pregnancy is important for the health of the woman, and the development and growth of the baby. Providing women with information and advice about nutritional needs during pregnancy is an important part of routine antenatal care. In providing this advice to Aboriginal and Torres Strait Islander women, it is important to consider the significance of barriers to accessing nutritious foods (eg fresh fruit, vegetables) because of costs and lack of availability in rural and remote regions (refer to Chapter 1: Lifestyle, 'Overweight and obesity').

Weight and body mass index

Overweight and obesity is becoming increasingly common in Australia, and is more common in Aboriginal and Torres Strait Islander population groups.[9] In 2014, obesity during pregnancy was documented for 33% of Aboriginal and Torres Strait Islander women compared to 20% of non-Indigenous women.[1]

Being overweight (body mass index [BMI] ≥25 kg/m^2) or underweight (BMI <18.5 kg/m^2) before pregnancy are each associated with an increased risk of adverse birth outcomes. Being overweight before pregnancy or having a high weight gain during pregnancy is associated with higher rates of preterm birth, caesarean section, gestational high blood pressure or pre-eclampsia, gestational diabetes, postpartum haemorrhage, and depression, as well as a baby being more likely to be of low birthweight or large for gestational age. Being underweight before pregnancy or having a low weight gain during pregnancy is associated with an increased risk of preterm birth, low birthweight and being small for gestational age.

The national evidence-based antenatal care guidelines recommend routine assessment of a woman's weight and height, and calculation of BMI at the first antenatal care visit.[4] Weighing women at subsequent visits is recommended only when it is likely to influence clinical management.

Recommended weight gain during pregnancy varies with a woman's estimated pre-pregnancy BMI from a total of 6 kg to 18 kg (Box 1). While weight loss is not an appropriate aim during pregnancy, strong evidence suggests interventions for women who are overweight based on increased physical activity and dietary counselling combined with weight monitoring can reduce inappropriate weight gain during pregnancy, as well as reduce the risks of caesarean section, macrosomia and neonatal respiratory morbidity.[38–40]

Iron

Aboriginal and Torres Strait Islander populations are at greater risk of anaemia,[41] and iron deficiency is the most common cause of anaemia. Routine iron supplementation for all pregnant women is not recommended, because evidence of improved pregnancy outcomes is lacking and there may be adverse impacts.[4] However, it is recommended that all women be screened for anaemia at the first and subsequent visits during pregnancy, and that iron supplementation be used to treat iron deficiency if it is detected.[4] Management of iron deficiency anaemia during pregnancy includes dietary advice, iron supplementation and follow-up. Pregnant women can potentially benefit by being advised about iron-rich foods and that iron absorption can be aided by vitamin C–rich foods, such as fresh fruit and fruit juice, and reduced by tea and coffee.[4,42]

Folic acid

Routine folic acid supplementation before and during pregnancy is recommended for all women as it is effective in reducing the risk of neural tube defects.[4] The incidence of this group of congenital abnormalities decreased in Australia among non-Indigenous women after folic acid supplementation during pregnancy became widespread.[43] However, Aboriginal and Torres Strait Islander women were still experiencing high rates of neural tube defects.[43,44] Following mandatory folic acid fortification of bread, which has occurred since 2009, rates of neural tube defects among Aboriginal and Torres Strait Islander women have dropped significantly and are now lower than those of other Australian women.[45]

Iodine

Increased thyroid activity during pregnancy results in increased maternal requirements for iodine, which is essential for neuropsychological development. While severe iodine deficiency during pregnancy is uncommon in Australia, recent evidence suggests that mild and moderate levels of iodine deficiency during pregnancy may result in negative impacts on the neurological and cognitive development of the child.[47] While mandatory iodine fortification of bread since 2009 has improved iodine levels in the general Australian population, available evidence suggests that for many women dietary intake of iodine will not be sufficient to meet needs during pregnancy and breastfeeding.[45] As a consequence, it is recommended that all pregnant women take an iodine supplement of 150 mcg daily.[4,47]

Vitamin D

Vitamin D is essential for skeletal development, and vitamin D deficiency may have a range of negative health impacts, including during pregnancy.[4,48] The prevalence of vitamin D deficiency varies geographically and between different population groups, and there have been few estimates of prevalence among Aboriginal and Torres Strait Islander populations.[49,50] Risk factors for vitamin D deficiency include limited exposure to sunlight, dark skin and a high BMI. Vitamin D supplementation for women with vitamin D deficiency increases maternal levels of vitamin D, but there is currently no evidence that it improves pregnancy outcomes.[4,48] Screening pregnant women for vitamin D deficiency is recommended only if they have risk factors, and women who are found to be vitamin D deficient should be treated with supplementation because of the potential benefits to their long-term health.[4,48]

Diabetes

Diabetes in pregnancy includes type 1 or type 2 diabetes diagnosed before pregnancy, undiagnosed pre-existing diabetes, and gestational diabetes, where glucose intolerance develops in the second half of pregnancy. All forms of diabetes in pregnancy are associated with increased risks for both the pregnant woman and the baby, with the level of risk depending on the level of hyperglycaemia.[3,51–53] Diabetes in pregnancy is associated with an increased risk of induced labour, preterm birth, caesarean section and pre-eclampsia. Babies of mothers with diabetes in pregnancy have higher rates of stillbirth, fetal macrosomia, low APGAR (Appearance, Pulse, Grimace, Activity, Respiration) scores, neonatal hypoglycaemia, and admission to special care/neonatal intensive care units. Babies born to mothers with pre-existing diabetes also have a higher risk of congenital malformations of the spine, heart and kidneys. In addition, raised maternal glycaemic levels are associated with a child having increased adiposity in childhood and other adverse metabolic factors that may increase the risks of later cardiovascular disease and diabetes. Women with gestational diabetes also have an increased risk of developing type 2 diabetes later in life.

The number of women with all types of diabetes in pregnancy is increasing. At a national level in 2014, an estimated 4% of Aboriginal and Torres Strait Islander women had diabetes in pregnancy and 13% had gestational diabetes, and each of these rates was higher than those of non-Indigenous women (3.5 times higher for diabetes and 1.6 times higher for gestational diabetes).[1]

Given the high prevalence of diabetes in Aboriginal and Torres Strait Islander populations, a significant number of Aboriginal and Torres Strait Islander women are likely to have undiagnosed diabetes at the time they become pregnant. Consequently, screening all Aboriginal and Torres Strait Islander women for pre-existing diabetes is recommended at the first antenatal care visit.[3,54] Tests recommended for screening for undiagnosed diabetes are fasting plasma glucose, plasma glucose after a 75 g glucose load, or random plasma glucose.[3] The use of HbA1C levels to screen for diabetes during pregnancy has not yet been fully evaluated, but has been proposed as an alternative test to consider for early pregnancy screening if other tests such as an oral glucose tolerance test are not feasible; an HbA1C level above 6.5% suggests pre-existing diabetes.[54]

Internationally, screening guidelines for gestational diabetes vary in their recommendations about whether screening should be offered to all pregnant women or only to women with risk factors for diabetes. However, given the higher risk of diabetes experienced by Aboriginal and Torres Strait Islander populations, it is recommended that all pregnant Aboriginal and Torres Strait Islander women without pre-existing diabetes are offered screening for gestational diabetes. The recommended timing for gestational diabetes screening to occur is 24–28 weeks' gestation, and recommended tests include fasting plasma glucose, or plasma glucose one hour and two hours after a 75 g glucose load.[3,54]

While diagnostic criteria for gestational diabetes continue to be debated, Australian national evidence-based antenatal care guidelines[3] and the Australasian Diabetes in Pregnancy Society[54] both recommend the use of criteria endorsed by the World Health Organization (WHO) and International Association of Diabetes and Pregnancy Study Group (refer to 'Recommendations: Diabetes').

In discussions about screening for diabetes and gestational diabetes, women need information about the risks associated with these conditions and the effectiveness of management in reducing and mitigating these risks.[56,57] In general terms, management strategies for diabetes in pregnancy and gestational diabetes include optimising nutrition, increasing physical activity, monitoring and controlling weight gain, additional monitoring activities including of fetal growth and wellbeing, and the use of medications. Medications include insulin and, increasingly, oral hypoglycaemics for women where adequate glycaemic control is not achieved using non-pharmacological measures. Optimising control of gestational diabetes is important to reduce pregnancy-related risks for the woman and baby, and may also have longer term implications on the health of the infant into adulthood.

For women with gestational diabetes, screening for diabetes after delivery is also important as it provides an opportunity for intervention to improve women's future health.[57]

Recommendations: Smoking cessation					
Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	Module/section of *Clinical practice guidelines: Antenatal care* [3,4]
Screening	All pregnant women	Regularly assess smoking status and remind patients to limit/avoid exposure to cigarette smoke	At first and subsequent antenatal visits	IA	Module 1, section 10.1
Behavioural	Pregnant women who smoke	Offer interventions to assist smoking cessation, including brief advice and more intensive, multi-component interventions (refer to Chapter 1: Lifestyle, 'Smoking')	At first and subsequent antenatal visits	IB	Module 1, section 10.1
Chemo-prophylaxis	Pregnant women who have not quit smoking after advice and psychosocial support	Consider nicotine replacement therapy (NRT) if smoking cessation counselling is not successful If women are interested in using NRT, discuss potential benefits and risks. These include the effectiveness of NRT at assisting quitting, and the limited evidence about safety of NRT considered in the context of the known harms of continued smoking Use intermittent forms of NRT (gum, inhaler, lozenges, spray) rather than continuous (patches), to reduce the total dose of nicotine	At each antenatal visit	IIB	Module 1, section 10.1

Recommendations: Genitourinary and blood-borne viral infections					
Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	Module/section of *Clinical practice guidelines: Antenatal care* [3,4]
Screening	All pregnant women <25 years and all pregnant women from communities with a high prevalence of sexually transmitted infections (STIs), including those in outer regional and remote areas	Offer chlamydia testing, with a nucleic acid amplification test (eg PCR) of a first-void urine, or endocervical swab, or self-collected vaginal swab or tampon specimen Consider repeat screening later in pregnancy in areas of high prevalence	At first antenatal visit	IIIC GPP	Module 1, section 8.5
	Pregnant women who have known risk factors or who live in or come from communities with a high prevalence of gonorrhoea, including those in outer regional and remote areas	Offer testing for gonorrhoea, with a nucleic acid amplification test (eg PCR) of a first-void urine, or endocervical swab, or self-collected vaginal swab or tampon specimen Consider repeat screening later in pregnancy in areas of high prevalence	At first antenatal visit	GPP	Module 2, section 8.4
	Pregnant women with symptoms of trichomoniasis	Offer testing for trichomoniasis, with a nucleic acid amplification test (eg PCR) of a vaginal swab or tampon specimen Screening asymptomatic pregnant women for trichomoniasis is not recommended	On presentation	IIIB	Module 2, section 8.5
	Pregnant women with symptoms of bacterial vaginosis (BV)	Offer testing for BV, with microscopy of a high vaginal swab Screening asymptomatic pregnant women for BV is not recommended	On presentation	IIB	Module 1, section 8.8

Recommendations: Genitourinary and blood-borne viral infections					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**Module/section of *Clinical practice guidelines: Antenatal care*[3,4]**
Screening	All pregnant women	Offer either antenatal screening for Group B streptococcus (GBS) colonisation (using microscopy and culture of a self-collected vaginal–rectal swab) or an assessment of risk factors for GBS transmission during labour	Screening at 35–37 weeks' gestation Risk factor assessment during labour	IIB–IIIC	Module 2, section 8.6
		Offer serological testing for syphilis, with a treponemal-specific enzyme immunoassay test (eg *Treponema pallidum haemagglutination assay* [TPHA] or fluorescent treponemal antibody absorption [FTA-ABS]) Consider repeat screening later in pregnancy in areas of high prevalence	At first antenatal visit	IIB GPP	Module 1, section 8.6
		Offer serological testing for HIV, with a combined HIV antigen and antibody test	At first antenatal visit	IIB	Module 1, section 8.1
		Offer serological testing for hepatitis B virus (HBV) surface antigen	At first antenatal visit	IA	Module 1, section 8.2
	Pregnant women with risk factors for hepatitis C virus (HCV), including intravenous drug use, tattooing and body piercing, and incarceration	Offer serological testing for HCV antibodies Note: If HCV antibodies are detected, a HCV RNA PCR test is required to indicate whether HCV infection is past or current Routine screening of pregnant women without risk factors for HCV is not recommended	At first antenatal visit	IIIC	Module 1, section 8.3
	All pregnant women	Offer testing for asymptomatic bacteriuria with a mid-stream urine microscopy and culture In areas with limited access to pathology testing, dipstick tests may be used to exclude asymptomatic bacteriuria but positive results must be confirmed by mid-stream urine culture	At first antenatal visit	IA GPP	Module 1, section 8.7
Environmental	Pregnant women with positive results for a genitourinary or blood-borne infection	Ensure adequate recall systems are implemented for follow-up Recommend partner treatment and contact tracing for STIs (Refer to Chapter 14: Sexual health and blood-borne viruses)		GPP	

Recommendations: Nutrition and nutritional supplementation					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**Module/section of *Clinical practice guidelines: Antenatal care*[3,4]/ References**
Screening	All pregnant women	Measure height and weight and calculate BMI Advise women about appropriate weight gain during pregnancy (Box 1) Repeated weighing during pregnancy is recommended only when clinical management is likely to be influenced	At the first antenatal visit At subsequent visits if clinically indicated	IIB IB GPP	Module 1, section 7.2
	All pregnant women	Offer a full blood examination to assess for anaemia	At first antenatal visit, 28 and 36 weeks' gestation	GPP	Module 2, section 8.1
	Pregnant women with risk factors for vitamin D deficiency (limited sun exposure, dark skin, BMI >30 kg/m^2)	Consider serology testing for vitamin D levels, particularly in the non-summer months	At first antenatal visit	GPP	Module 1, section 8.9
Behavioural	All pregnant women	Provide information on the benefits of a healthy diet in pregnancy and give practical, tailored advice on healthy eating (refer to Chapter 1: Lifestyle, 'Overweight/obesity')	Early in pregnancy	GPP	Module 2, section 5.1
Chemo-prophylaxis	All pregnant women and those considering pregnancy	Recommend 500 mcg of oral folic acid daily to reduce the risk of newborn neural tube defects	At least one month prior to pregnancy and for the first 12 weeks of pregnancy	IA	Module 1, section 10.4.1
	Women with diabetes	Recommend a higher dose of 5 mg of folic acid orally daily to reduce the risk of newborn neural tube defects	At least one month prior to pregnancy and for the first 12 weeks of pregnancy	IIIC	Australasian Diabetes in Pregnancy Society guidelines[53]
	Pregnant women with proven vitamin D deficiency	Offer vitamin D supplementation because of potential benefits for a woman's long-term health	At diagnosis	GPP	Module 1, section 8.9
	Pregnant women with proven iron deficiency Pregnant women who are not iron deficient	Offer iron supplementation (oral or intravenous with the dose titrated according to the clinical situation) Routine iron supplementation is not recommended	At diagnosis	IIB	Module 2, section 8.1.3 National Blood Authority guidelines[42] Module 1, section 10.4.4
	All pregnant women	Offer iodine supplementation with 150 mcg/day	At first antenatal visit	GPP	Module 1, section 10.4.3

Recommendations: Diabetes					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**Module/section of *Clinical practice guidelines: Antenatal care*[3,4]**
Screening	All pregnant women who do not have diagnosed diabetes	Measure fasting plasma glucose to screen for pre-existing diabetes (Box 2) If not feasible to obtain a fasting blood test, alternatives include random blood glucose or HbA1c (refer to Chapter 12: Type 2 diabetes)	At first antenatal visit	GPP	Module 2, section 8.2.3
	All pregnant women who do not have diagnosed diabetes	Perform a 75 g two-hour oral glucose tolerance test (GTT) If a two-hour GTT is consistently difficult to achieve, consider alternative tests such as a random or fasting plasma glucose	Between 24–28 weeks gestation	GPP GPP	Module 2, section 8.2.3
	Women diagnosed with gestational diabetes who are now post-partum	Perform a 75 g fasting glucose tolerance test to assess for the presence of diabetes	At six weeks post-partum	GPP	Module 2, section 8.2.5
Behavioural	Pregnant women with diabetes	Offer advice and resources to promote good glycaemic control throughout pregnancy – encourage healthy diet and exercise Consider referral to specialist services, and consult specific management guidelines for ongoing care (refer to 'Resources')	At diagnosis	GPP	Module 2, section 8.2.5
	Non-pregnant women who have a past history of gestational diabetes	Advise women about their future risks of developing diabetes and give advice on preventive strategies, including healthy diet, exercise and weight control (refer to Chapter 1: Lifestyle, and Chapter 12: Type 2 diabetes) Screen for diabetes with a fasting blood glucose (refer to Chapter 12: Type 2 diabetes)	At post-partum checks and as part of an annual health assessment	GPP	Module 2, section 8.2.5

Recommendations: Summary of other antenatal care screening and activities					
Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	Module/section of *Clinical practice guidelines: Antenatal care*[3,4]/ References
Screening	All pregnant women	Discuss and plan the schedule of antenatal visits with the pregnant woman based on her individual needs For an uncomplicated pregnancy, 10 visits are recommended for women having their first pregnancy, and seven visits for women having subsequent pregnancies	At first antenatal visit	IB	Module 1, section 6
		Offer an ultrasound scan to determine gestational age and detect multiple pregnancies	Best performed between 8 weeks and 13 weeks + 6 days' gestation	IIB	Module 1, section 7.1
		Assess blood pressure	At first and subsequent antenatal visits	IIB	Module 1, section 7.3
		Test for proteinuria* Use an automated urinary dipstick analyser, if available, as it is more accurate than visual inspection of a dipstick result If a urinary dipstick is positive for protein, further assessment with a 24-hour urinary protein or protein:creatinine ratio is required	At first antenatal visit Repeat at subsequent visits if clinically indicated – for example, for women with high blood pressure or kidney disease	GPP	Module 1, section 7.4
		Auscultate for heart murmurs Have a low threshold for referral for echocardiography and assessment in areas with a high prevalence of rheumatic heart disease	At first antenatal visit	GPP	
		Advise women to have an oral health check and treatment if required (refer to Chapter 8: Oral and dental health)	At first antenatal visit	IB	Module 1, section 10.5
		Offer cervical screening if due (refer to Chapter 15: Prevention and early detection of cancer)	During first trimester	GPP	Module 2, section 8.9 National Cervical Screening Program guidelines[58]
		Offer all women rubella serology testing to check their levels of immunity Follow up women with low rubella immunity after delivery to offer rubella immunisation	At first antenatal visit	IIB	Module 1, section 8.4

Recommendations: Summary of other antenatal care screening and activities					
Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	Module/section of *Clinical practice guidelines: Antenatal care*[3,4]/ References
Screening	All pregnant women	Check blood group and antibodies	At first visit and 28-week visit	IIB	Module 2, section 8.3
		Offer an ultrasound scan to assess for fetal morphology abnormalities and placental location†	At 18–20 weeks	IIB	Module 2, section 6.1
		Assess background level of risk of chromosomal abnormalities such as Down syndrome, based on age, family history, past obstetric history and other risk factors Discuss the purpose and implications of screening for chromosomal abnormalities to promote an informed decision‡	At first antenatal visit	GPP	Module 1, section 9.2
	Pregnant women who choose first trimester screening for chromosomal abnormalities	Offer combined screening for chromosomal abnormalities with ultrasound assessment of nuchal translucency thickness, and serological testing for free beta-human chorionic gonadotrophin and pregnancy-associated plasma protein A	Combined screening: blood tests: 9–13 weeks + 6 days' gestation Ultrasound assessment: 11–13 weeks + 6 days' gestation	IIB	Module 1, section 9.3
	Pregnant women who present after first trimester and choose to have second trimester blood tests to screen for chromosomal abnormalities	Offer screening for chromosomal abnormalities with second trimester serological testing for estriol, free beta-human chorionic gonadotrophin, and alpha fetoprotein (triple test), or with inhibin A added (quadruple test)	14–20 weeks' gestation	IIB	Module 1, section 9.3
	Pregnant women who have a positive first or second trimester screening test, or a high baseline risk of congenital abnormalities because of risk factors, and who choose to have a second trimester diagnostic test	Offer chorionic villus sampling before 14 weeks, or amniocentesis after 15 weeks		IIB	Module 1, section 9.4

Recommendations: Summary of other antenatal care screening and activities

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	Module/section of *Clinical practice guidelines: Antenatal care*[3,4]/ References
Screening	All pregnant women	Ask women about psychosocial factors, including past and current life stressors (housing, finances, grief and loss), family and social supports, and previous or current mental health disorders (refer to Chapter 17: Mental health)	Early in pregnancy, and during subsequent visits if clinically indicated	GPP	Module 1, section 7.6
		Use the Edinburgh Postnatal Depression Scale or another validated perinatal mental health assessment tool to assess women for symptoms of depression and anxiety during the antenatal period,[§] and follow up women who screen positive Ask about women's exposure to family violence (refer to Chapter 16: Family abuse and violence) If a woman discloses that she is experiencing violence, respond immediately taking into account the woman's safety and that of children in her care, her individual circumstances and preferences, confidentiality and privacy, family and community structures and support, and local services	Early in pregnancy, and during subsequent visits if clinically indicated	IIB	Module 1, section 7.6 beyondblue Clinical practice guidelines for perinatal period[60]
Immunisation	All pregnant women	Review influenza immunisation status and offer where appropriate (refer to Chapter 9: Respiratory health, 'Influenza') Offer a booster dose of adult pertussis vaccine (dTpa) to all women in the third trimester. This is to help protect infants against pertussis before they commence immunisations at two months of age	Opportunistic; influenza vaccination can be given at any time during pregnancy Pertussis vaccine is recommended in third trimester	GPP	*The Australian immunisation handbook*[61]

*Risk factors for pre-eclampsia include age >40 years, first or multiple pregnancy, BMI >30, diabetes, vascular or kidney disease, personal or family history of pre-eclampsia, raised blood pressure at first visit, pregnancy interval >10 years.

[†]There is emerging evidence that measurement of cervical length at this ultrasound may detect those women at increased risk of preterm delivery and may offer an opportunity for intervention, such as progesterone pessaries.[62] However, there is currently insufficient evidence to recommend this as routine practice.

[‡]First trimester combined screening is with nuchal translucency thickness ultrasound and serological testing for free beta-human chorionic gonadotrophin and pregnancy-associated plasma protein A. Non-invasive prenatal testing (NIPT) involves testing maternal plasma for cell-free DNA, and can be undertaken after 10 weeks' gestation. While NIPT is more accurate than other approaches to screening, it is also more expensive, and testing is currently not covered by Medicare and therefore incurs significant out-of-pocket costs for women ($500 or more).[59]

For women who present after the first trimester, second trimester screening with serological testing can be offered, but is less accurate than first trimester screening options. Second trimester screening involves serological testing for oestriol, free beta human chorionic gonadotrophin and alpha fetoprotein (triple test) or with inhibin A added (quadruple test). Second trimester diagnostic tests for congenital abnormalities include chorionic villus sampling or amniocentesis.

[§]The Edinburgh Postnatal Depression Scale is a validated screening tool that includes 10 questions and leads to a score that indicates levels of risk of depression. The tool and guidance on its interpretation and use can be found on the beyondblue website at www.beyondblue.org.au/health-professionals/perinatal-mental-health/perinatal-mental-health-questionnaires and in the beyondblue Perinatal Clinical Practice Guidelines.[60] The Kimberley Mums Mood Scale (KMMS) is a perinatal mental health assessment tool designed and validated specifically for use with Aboriginal women from the Kimberley region. The tool, as well as training and support materials, are available at http://kimberleymumsmoodscale.weebly.com

Box 1. Institute of Medicine recommended weight gain during pregnancy by pre-pregnancy BMI[4]

BMI (kg/m2)	<18.5	18.5–24.9	25.0–29.9	≥30.0
Recommended weight gain during pregnancy (kg)	12.7–18.1	11.3–15.9	6.8–11.3	5–9

Adapted from Australian Health Ministers' Advisory Council. Clinical practice guidelines: Antenatal care – Module 1. Canberra: Department of Health and Ageing, 2012, Table 7.3.

Box 2. World Health Organization and International Association of Diabetes and Pregnancy Study Group criteria for diagnosis of diabetes in pregnancy[54]

Diagnosing diabetes in pregnancy: One or more of the following criteria are met	
Measure	**Criteria**
Fasting plasma glucose	≥7.0 mmol/L
Two-hour plasma glucose	≥11.1 mmol/L following a 75 g oral glucose load
Random plasma glucose	≥11.1 mmol/L in the presence of diabetes symptoms

Diagnosing gestational diabetes: One or more of the following criteria are met at any time during pregnancy	
Measure	**Criteria**
Fasting plasma glucose	5.1–6.9 mmol/L
One-hour plasma glucose	≥10 mmol/L following a 75 g oral glucose load
Two-hour plasma glucose	8.5–11.0 mmol/L following a 75 g oral glucose load

Resources

- Australian Health Ministers' Advisory Council. Clinical practice guidelines: Antenatal care – Modules I and II, www.health.gov.au/internet/main/publishing.nsf/Content/phd-antenatal-care-index
- Australasian Diabetes in Pregnancy Society, 'ADIPS consensus guidelines for the testing and diagnosis of hyperglycaemia in pregnancy in Australia and New Zealand', www.adips.org/downloads/2014ADIPSGDMGuidelinesV18.11.2014_000.pdf
- Kimberley Aboriginal Medical Services Council, 'Diabetes in pregnancy', www.kamsc.org.au/wp-content/uploads/2015/04/mcp-Diabetes-in-Pregnancy.pdf
- King Edward Memorial Hospital, 'Clinical practice guideline: Vitamin D deficiency in pregnancy', www.kemh.health.wa.gov.au/development/manuals/O&G_guidelines/sectionb/1/b1.1.9.pdf
- beyondblue, Clinical practice guidelines on depression and related disorders in the perinatal period, www.beyondblue.org.au/health-professionals/clinical-practice-guidelines
- National Health and Medical Research Council (NHMRC), Australian guidelines to reduce health risks from drinking alcohol, www.nhmrc.gov.au/_files_nhmrc/publications/attachments/ds10-alcohol.pdf
- National Health and Medical Research Council (NHMRC), Iodine, Public statement: 'Iodine supplementation for pregnant and breastfeeding women', www.nhmrc.gov.au/_files_nhmrc/publications/attachments/new45_statement.pdf

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Chapter 3: Child health

Immunisation

Background

Immunisation has had a powerful impact in preventing disease in Aboriginal and Torres Strait Islander children.[1,2] However, Aboriginal and Torres Strait Islander children still experience higher rates of vaccine-preventable diseases,[1,3–6] issues with timeliness of vaccination,[7,8] and suboptimal rates of vaccination coverage for vaccines in the National Immunisation Program (NIP) when compared to non-Indigenous children, particularly at younger ages.[2,8–13] There has, however, been continued improvement in immunisation coverage since the last edition of this guide.[8] Data from the Australian Immunisation Register (AIR) show annual rates of coverage to March 2017 for children aged 60 to <63 months was higher in Aboriginal and Torres Strait Islander children at 95.26% compared with all children of the same age at 93.32%. For the same period, 93.63% of children Australia-wide aged 12 to <15 months were fully vaccinated, while 91.76% of Aboriginal and Torres Strait Islander children at the same age were fully vaccinated.[1,2,9–14] The AIR coverage estimates are reliable with regards to identifying Aboriginal and Torres Strait Islander status of children;[12] however, routine reports on immunisation coverage allow for significant lags in immunisation. The AIR's reporting of coverage rates at one year of age are based on completion of vaccinations scheduled at age six months or earlier,[12,13] so these data do not show the magnitude of the problem of vaccine delay. Figures published in the National Centre for Immunisation Research and Surveillance's *Annual immunisation coverage report, 2015* show a differential of 18.4% lower coverage for seven-month-old Aboriginal and Torres Strait Islander children compared to non-Indigenous children.[8]

Some vaccination programs are not universally applicable to all Australian children and target Aboriginal and Torres Strait Islander children only. Comparison of rates of immunisation coverage from universally applicable versus targeted vaccination programs show the latter are usually associated with lower rates of immunisation coverage in Aboriginal and Torres Strait Islander children. This is reflected in low rates of coverage for hepatitis A vaccine (2014 coverage one dose [63%] or two doses [79.8%]) and 13vPPV (66.9%), both of which are vaccinations recommended for Aboriginal and Torres Strait Islander children only.[1,2,5,6,15] Rates for influenza vaccination vary greatly across jurisdictions, with over 50% of children aged six months to <60 months in the Northern Territory receiving at least one dose of vaccine in 2015, while only 2.5% were recorded as having received at least one dose in Victoria.[1,15,16] These data come with the caveat that there is likely underreporting of influenza immunisation as there is currently no incentive payment to report this to AIR.[15]

There is also evidence that non-vaccine serotypes cause a disproportionate amount of disease in Aboriginal children compared to non-Aboriginal children with regard to some vaccine-preventable diseases. This has been seen with invasive pneumococcal disease.[1,17–19] It is likely that factors other than immunisation coverage, such as heavy nasopharyngeal colonisation, poorer immunologic responses, and persistent nasopharyngeal carriage continue to contribute to higher rates of vaccine-preventable and non–vaccine-preventable disease in Aboriginal and Torres Strait Islander children.[6]

Compared to young non-Indigenous adults, young Aboriginal and Torres Strait Islander adults experience a much higher rate of invasive pneumococcal disease due to non-7vPCV serotypes.[1,5,20] Coverage rates for influenza and pneumococcal vaccination 23vPPV in eligible Aboriginal and Torres Strait Islander people aged 15–49 years are low.[1]

The Australian immunisation handbook, 10th edition,[19] recommends specific vaccines for Aboriginal and Torres Strait Islander peoples. Many of these vaccines are funded under the NIP, others are funded by state or territory government programs, and others are recommended but not currently funded under any program.

Interventions

In addition to the general vaccination schedule for all children, the following vaccines are covered under the NIP for Aboriginal and Torres Strait Islander children and adolescents:

- influenza – ages six months to <5 years and ≥15 years
- hepatitis A – 12–24 months (two doses) in high-risk areas (ie Northern Territory, Queensland, South Australia and Western Australia)
- pneumococcal disease – additional fourth dose at 12–18 months of age with 13vPPV in high-risk areas (ie Northern Territory, Queensland, South Australia and Western Australia).

In addition to the NIP vaccines, *The Australian immunisation handbook* recommends the following vaccines for Aboriginal and Torres Strait Islander peoples (health authorities should be consulted to determine exact geographic boundaries):

- tuberculosis (BCG) – newborns living in areas of high tuberculosis incidence (one dose)
- influenza – people aged ≥6 months (refer to Chapter 9: Respiratory health, 'Influenza prevention' for more detail)
- pneumococcal disease – people aged 15–49 years with underlying conditions at increased risk of invasive pneumococcal disease[19] (refer to Chapter 9: Respiratory health, 'Pneumococcal disease prevention' for more detail).

A large number of interventions can improve immunisation coverage and these can be summed up under three categories: provider/system based interventions, enhancing access to vaccination services, and increasing community demand for vaccination. Effects may be increased if the interventions are administered in combination rather than as single interventions.[21,22]

Recommendations: Immunisation

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Immunisation*	All children	Conduct regular review of all infants and children and offer vaccination	As per National Immunisation Program Schedule (NIPS)[23] and relevant state and territory immunisation schedules	IA	19
		Use the 'catch-up' schedule for all children behind in their vaccination schedule	Opportunistic	IA	19
	Pregnant women	Offer influenza vaccination	At any stage of pregnancy	IA	19, 23
		Offer diphtheria/tetanus/pertussis (dTpa) vaccination	Third trimester of each pregnancy (28–32 weeks)	IA	19
	Women planning pregnancy and those post-delivery	Vaccinate with measles, mumps, rubella, with or without varicella as appropriate >28 days prior to conception or as soon as possible following delivery. Serological status should be checked post-vaccination	28 days prior to conception or post-delivery where serological immunity is inadequate	IA	19
Environmental		Implement provider/system-based interventions Review vaccination status at every clinic visit and make a documented plan for the next vaccination	Every visit	IA	24

Recommendations: Immunisation					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Environmental		Ascertain local clinic vaccination rates via audits of health records and Australian Immunisation Register (AIR) records		IA	24–27
		Implement recall and reminder systems and computer prompts for staff and patients to address immunisation gaps, particularly in the first 12 months of age		IA	24–30
		Implement an adverse events reporting system		IA	24–30
		Increase access to vaccinations via: • fast-tracking children presenting for immunisation • training and reminders for staff to screen and offer vaccinations • providing home visits and mobile clinics for immunisation If resources are limited, focus particularly on vaccinations due in the first 12 months		IA	24, 26, 27, 29, 30
		Increase community demand for vaccinations by: • promotion of vaccination to parents, childcare staff, Aboriginal and Torres Strait Islander community workers such as Aboriginal and Torres Strait Islander liaison officers • use of posters and other visual materials in public places • personalised health records • giving all parents/carers a record in card or book form of their child's immunisation status • commencing promotional activities for parents in the antenatal period and in places attended by parents of very young babies	Ongoing	IA	21, 24, 26–29, 31, 32
*Vaccination should be implemented according to best practice recommendations of the NIPS[23] and relevant state and territory immunisation schedules.					

Resources

- Australian Techinical Advisory Group on Immunisation (ATAGI), *The Australian immunisation handbook*, 10th edition (2017 update), www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home
- SA Health, Immunisation calculator ('catch-up' schedule), https://immunisationcalculator.sahealth.sa.gov.au

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Anaemia

Background

This chapter reviews the evidence for the prevention of iron deficiency anaemia (IDA).

IDA is very common in Aboriginal and Torres Strait Islander children, although data are lacking from many settings, particularly in urban areas. A prevalence of greater than 5% is considered by the World Health Organization (WHO) to be of public health significance; the data that are available indicates rates of IDA in Aboriginal and Torres Strait Islander children in remote Australia are significantly higher.[1–3] A recent retrospective cohort study in the Northern Territory found 52% of school-aged children had iron deficiency anaemia.[4] IDA is associated with developmental delay of both cognitive and psychomotor functions, although it is not clear whether the relationship is causal or associative.[1,5–11] Morbidity from infectious disease is increased in iron-deficient populations because of the adverse effect of iron deficiency on the immune system. IDA also increases the risk of heavy-metal poisoning in children because iron-deficient individuals have an increased absorption capacity for other heavy metals, including toxic metals such as lead and cadmium.[12]

Contributors to IDA in Aboriginal and Torres Strait Islander children are multifactorial and may include low birthweight, prematurity and maternal anaemia, twin birth, poor quality and late introduction of weaning foods, high rates of infection and tropical enteropathy syndrome associated with failure to thrive (FTT), and cow's milk in the first year.[5,10,12–15] Moderate to severe infestations with hookworm, via intestinal blood loss, can also contribute to IDA.[1,13,15,16]

In Aboriginal and Torres Strait Islander children, anaemia is most commonly diagnosed by capillary haemoglobin (Hb) with red cell indices, and further investigation is not usually required.[1,5,10,15] In Aboriginal and Torres Strait Islander children, anaemia is almost always caused by iron deficiency, and intercurrent rates of infection are high, making iron indices an unreliable indication of current iron stores. A common diagnostic approach in high prevalence areas is to measure the Hb response to iron therapy without measuring iron indices. If Hb does not improve, adherence should be confirmed and further investigation is warranted. The prevalence of haemoglobinopathies as a cause for microcytic anaemia is low, but should still be considered as a possible cause, particularly in those in whom treatment for IDA fails to show an improvement in Hb.[17,18]

There is widespread agreement that Hb limits to define anaemia should differ according to age, gender and physiological status (eg pregnancy), and for babies whether they are breast or bottle fed. The Kimberley Aboriginal Medical Services and the Central Australian Rural Practitioners Association define anaemia in children aged 6–12 months as being Hb <105 g/L, children 1–4 years as Hb <110 g/L, and children 5–7 years as Hb <115 g/L.[1,15]

Interventions

International guidelines state there is insufficient evidence to recommend either for or against universal screening for IDA in children.[19,20] However, these guidelines draw attention to groups of children at high risk of anaemia and the subsequent importance of clinical assessment as a means of informing decisions about whether to screen. Some Australian guidelines recommend screening all Aboriginal and Torres Strait Islander children.[15] Screening can be done with venous blood, but this may not be acceptable to all carers of young children. If there is good training and quality control, point-of-care testing of capillary Hb can correlate well with laboratory testing.[1,15,21] Though *Helicobacter pylori* infection is associated with IDA in children, benefits of mass screening have not been demonstrated.[22–25] However, if an individual has a confirmed infection with *H. pylori*, treatment generally improves IDA.[25]

Evidence differs in regard to whether chemoprophylaxis using oral iron supplementation should be offered universally, without screening, to children who are at high risk of IDA and who are more than six months of age. This is iron supplementation aimed at preventing IDA,[10,12,14,20,26,27] as opposed to using it only for therapeutic effect.[1,5,15,28] This approach may be considered in areas where childhood anaemia rates are high.[9]

There is good evidence to support widespread use of multicomponent interventions that do not involve medicinal iron supplementation in prevention of IDA. This includes delaying cord clamping beyond three minutes, which increases iron stores from birth.[29–33] Multicomponent interventions need to be both early and often, and

may also involve food-based approaches, food and formula fortification, iron supplementation, treatment for hookworm, and integration of IDA prevention with other primary prevention programs such as immunisation and micronutrient supplementation for children with FTT. Interventions can be delivered through local healthcare providers, including GPs, nurses and Aboriginal health workers, and through government-funded nutritional supplementation programs.[1,5,10,12,14,15,26,34]

There are mixed data on whether there is improvement in cognition with oral iron supplementation, with outcomes dependent on the age that iron supplementation is provided.[35,36] In children under six years of age with IDA it is not clear whether oral iron supplementation confers benefits on cognitive or motor development. There is considerable variation in the populations studied, and there are no studies assessing this outcome in Aboriginal and Torres Strait Islander communities.[14,37]

Iron supplementation provided as 'sprinkles' shows promise,[38–41] as it may have fewer side effects and improve adherence to daily iron supplementation. However, this has not been borne out in all studies.[42] There is evidence that intermittent iron supplementation regimes comprising weekly, twice a week and three-week blocks of daily dosing improve Hb, although such approaches tend not to be as effective as daily dosing.[43–45]

Exclusive breastfeeding until six months has many benefits and is currently recommended Australia-wide;[34,46] however, there are concerns that this may not provide enough iron to babies at increased risk of IDA.[5,10,13] Many guidelines recommend giving oral liquid iron supplements to premature and low birth-weight infants from one month of age.[1,15,47,48] While IDA is often associated with FTT in Aboriginal and Torres Strait Islander children, there are currently insufficient data demonstrating that treatment of iron deficiency improves growth.[36,48,49]

In children with a history of IDA, recurrence of IDA may occur. This has major implications for long-term follow-up of children, highlighting the importance of IDA prevention programs being managed not just by individual clinicians, but at the health service level.[50–53]

Guidelines make strong reference to the link between poverty and poor nutrition. In low-income households, nutrition counselling on its own is not recommended. However, it may be effective if combined with government-funded nutritional support programs that remove financial barriers to improved nutrition.[10,19,26,34,54–56]

Recommendations: Anaemia

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All children	Take a nutritional history asking specifically about intake of iron-rich foods such as meat and fortified cereals, leafy green vegetables, vitamin C intake with meals and cow's milk intake	At age 6–9 months and repeat at 18 months	GPP	19, 20
	Children with the following risk factors: • history of low birth weight (LBW) or preterm birth • maternal anaemia • twin • failure to thrive • chronic infections • cow's milk intake <1 year of age	Perform haemoglobin (Hb) via point-of-care capillary sample or venous blood (including blood film)*†	Test at 6–9 months and repeat at 18 months	GPP	9, 15
		Use age-appropriate Hb levels to diagnose anaemia*[1,15]	Test more frequently if IDA is diagnosed	IIC	50, 51
	All children >6 months of age from communities with a high prevalence of iron deficiency anaemia (IDA)		Repeat test after six months; continue six-monthly testing if anaemia persists, in conjunction with appropriate treatment, and review until age five years	GPP	1

Recommendations: Anaemia					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	Babies born without risk factors for IDA	Recommend exclusive breastfeeding until six months of age	Opportunistic	IB	5, 10, 34, 46
	Babies born with LBW (<2500gm), prematurity (<37 weeks,) or to mothers who had maternal anaemia	Recommend exclusive breastfeeding until four months of age		GPP	5, 10, 13
	All babies at around 4–6 months	Introduce iron-enriched infant cereals, pureed meat, poultry and fish, or cooked tofu and legumes Also discuss withholding cow's milk until 12 months of age and avoidance of tea		IB	5, 10, 34, 46, 57
Chemo-prophylaxis	Normal birth weight term babies <6 months with IDA risk factors	Consider oral iron supplementation in consultation with a paediatrician		GPP	3, 8, 12, 15
	Breastfed premature and low birth weight infants	Provide oral iron supplement from one month to four months of age‡	Opportunistic and as part of routine postnatal care	GPP	5, 15, 57
	Children six months to 16 years in areas with high rates of hookworm infections	Consider use of single-dose albendazole as part of a systematic child health surveillance program in consultation with local public health units Refer to Australian *Therapeutic guidelines* for dosing regimen[58]	Every six months	GPP	1, 2, 15, 16
Environmental	Children with IDA	Include children on recall registers for regular review and Hb repeat testing post-treatment and, if Hb normal, six-monthly until not considered at risk		GPP	10
	Communities with a known high prevalence of IDA	Advocate for and support nutritional programs that remove financial barriers to improved nutrition and improve the range and accessibility of healthy foods alongside the food strategies recommended above (refer also to Chapter 1: Lifestyle, 'Overweight/obesity')	Immediately and ongoing	IA	10, 19, 26, 34, 54

*The Kimberley Aboriginal Medical Services and the Central Australian Rural Practitioners Association define anaemia in children aged 6–12 months as being Hb <105 g/L, children aged 1–4 years as Hb <110g/L, and children aged 5–7 years as Hb <115g/L.

†There are some state and territory jurisdictional differences in the screening for anaemia, and local guidelines should be consulted.

‡Dosing schedules for iron supplementation can be found in the *Therapeutic guidelines* and on the website of the Royal Children's Hospital Melbourne (refer to 'Resources').

Resources

- Royal Children's Hospital Melbourne, 'Iron preparations and therapy', www.rch.org.au/genmed/clinical_resources/Oral_Iron_Preparations
- World Health Organization, *Iron deficiency anaemia: Assessment, prevention, and control: A guide for programme managers*, www.who.int/nutrition/publications/en/ida_assessment_prevention_control.pdf

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Growth failure

Background

Growth failure is the principal manifestation of malnutrition in children. The terms growth failure, growth faltering and failure to thrive (FTT) are used interchangeably, and refer to the failure to achieve the growth potential expected for a child. The term is usually applied when the growth crosses two or more centile lines downwards on a standard growth chart.[1] There are two main sets of sex-specific growth charts used in Australia: World Health Organization (WHO) charts for children aged 0–2 years, and US Centers for Disease Control and Prevention (CDC) charts for children aged 2–18 years.[2,3] Correction for prematurity should continue until at least two years of age. There are also specific growth charts for many specific chromosomal conditions such as trisomy 21.[4,5] It is important to be consistent with the chart being used and to consider the growth parameters in the context of the overall health of the child.[6]

Inadequate nutrient intake (which includes food and nutritious fluids such as breast milk and formula), decreased absorption of nutrients and/or increased metabolism are the main factors affecting undernutrition.[7] Most growth failure is due to inadequate nutrient intake; however, underlying causes, such as thyroid disease, should be excluded with a careful history, examination and investigation of positive findings.[2,7] Aboriginal and Torres Strait Islander peoples have an increased rate of preterm and low birth weight compared to non-Indigenous children, and this is an independent risk factor for growth failure.[7–9] While there are some medical causes for growth failure, once excluded, the most significant contributors are social and economic factors.[2,7]

The most common dietary problem for Aboriginal and Torres Strait Islander children is insufficient weaning foods at ages 6–24 months.[10] In all populations it may reflect any one or a combination of the following: multi-component feeding difficulties (often related to lack of food security), chronic ill health, high rates of adverse social determinants of health, or carer neglect. Some Aboriginal and Torres Strait Islander communities continue to have paediatric populations with disturbingly high rates of FTT, and these communities often have high rates of other complex and chronic paediatric conditions such as chronic suppurative otitis media (CSOM,) acute rheumatic fever, rheumatic heart disease, and fetal alcohol syndrome (FAS). Such communities may also have high rates of notifications of family abuse and violence, although there is less clear data on what proportion of these notifications are substantiated.[11]

The long-term health sequelae from childhood growth failure are significant. There is evidence that intrauterine growth restriction and growth failure in early childhood are associated with the development of obesity in later childhood and adult cardiovascular disease.[12,13] Increased risks for secondary disability from FTT, including cognitive, neurological and psychomotor deficits, persist despite interventions. However, permanent growth retardation may be prevented. Even though some of the serious consequent disabilities may not be prevented,[14,15] rapid and appropriate interventions in a child with FTT are recommended to prevent other consequences. Although approaches to FTT in different parts of the world share some similarities, it is important that they are context specific.[16] In Aboriginal and Torres Strait Islander community settings, interventions to prevent FTT need to address the social determinants of health, which implies improvements in non–health-related areas such as overcrowded living conditions, housing, hygiene, education and employment. Admitting children to hospital to provide intragastric tube feeding in an attempt to achieve rapid catch-up growth may have deleterious effects in the long term.[17]

Interventions

FTT assessment includes not only detailed history and physical examination, but also an assessment for psychosocial deprivation and developmental assessment. If there is an absence of other signs or symptoms, it is usually appropriate to embark on a trial of improved nutrition prior to proceeding immediately to further investigation.[10,18,19] The importance of empathy and close follow-up reviews must be emphasised. However, there is evidence that action plans are lacking after identification of growth faltering in Aboriginal children. This is of particular concern in areas with high staff turnover, where there are practitioners providing services for short blocks of time. As a result, existing systems may not always provide adequate follow-up of growth faltering.[20]

Growth monitoring as an opportunistic activity to undertake with usual clinical care, rather than as a specific screening tool, has been found to be particularly useful in diagnosing FTT.[21] One important systematic review[22,23] recommended that growth monitoring be integrated into a broader primary healthcare program and stressed the need for effective follow-on action. While high-level evidence for the effectiveness of growth monitoring is lacking, monitoring is now being recommended for early detection of overweight and obesity (refer to Chapter 1: Lifestyle: 'Overweight and obesity').

The current RACGP *Guidelines for preventive activities in general practice* (Red Book) recommend weight/height/head circumference at seven days, then at six weeks, then at four, six, 12 and 18 months.[24,25] It makes the point that weight may need to be monitored more frequently if there are clinical concerns. One guideline for the Kimberley region recommends even more frequent monitoring of weight, height and head circumference.[18] Some guidelines recommend against such regular monitoring.[19] Irrespective of frequency, growth monitoring in situations of malnutrition should be accompanied by history gathering and counselling, including food intake patterns and the caregiver's perspectives of what they feel about their child's development and growth. In many growth-monitoring programs, often carried out by low-skilled staff or volunteers, it has been noted that the skill and experience necessary for such counselling may not be available. Health professionals do not often engage in counselling because they have not received adequate training and supervision/support in counselling, or because of the increased workloads associated with counselling.[21]

Growth charts need to be interpreted with a knowledge of the health context of the community within which a health professional works. In non-Indigenous communities, the weights of breastfed babies may fall below two centile lines, and use of complementary formula can increase weight. Such babies are not necessarily described as having FTT.[26] There is no such description used among Aboriginal and Torres Strait Islander peoples. We would therefore recommend focusing on the progress and cross-sectional observations of the growth profiles with the growth charts while considering the health and psychological context of the child and family.

FTT has been associated with depressed developmental test scores.[14] There is strong evidence to support publicly funded, centre-based, comprehensive early childhood development programs for children aged 3–5 years of low-income families based on their effectiveness in preventing delay of cognitive development and increasing readiness to learn, but evidence is insufficient to determine the effectiveness of early childhood programs on child health screening outcomes.[27] However, such programs may be useful as secondary prevention strategies to prevent some of the possible deleterious follow-on effects of FTT. Routine developmental screening is recommended in the current edition of the RACGP Red Book and is timed to coincide with growth-monitoring checks and other important interventions such as immunisations.[25] Other Australian guidelines also recommend developmental surveillance be tied in with routine child checks rather than singled out.[19] However, there is no consensus on the correct developmental assessment tool to use with Aboriginal and Torres Strait Islander children, and none have been validated in Aboriginal and Torres Strait Islander populations. Parent-reported developmental assessment tools, such as the Ages and Stages Questionnaire (ASQ) or Parents' Evaluation of Developmental Status (PEDS), or objective tools such as the Denver Developmental Screening Test (DDST), may be used.[19,28]

Although it is important to consider neglect if a child has FTT secondary to an inadequate diet, it is clearly difficult to distinguish between neglect and material poverty.[29] There is some evidence that neglect may be more common in communities which experience poverty. It is useful to consider the constraints on the parents' or carers' ability to meet their children's needs within a framework of understanding how other people in similar circumstances have been able to meet those needs.[25,30,31] The effects of many programs to prevent neglect is not known[32,33] and outcome evaluations of child maltreatment prevention interventions are exceedingly rare in low-income and middle-income countries.[34] A Cochrane review showed insufficient evidence to support parenting programs as an intervention in child abuse, including neglect.[35] The Triple P parenting program is a well known multilevel program aimed at helping caregivers find solutions to parenting and child-rearing problems. If it is being considered for Aboriginal and Torres Strait Islander families, it is recommended that child health professionals consult with their local community regarding the cultural appropriateness and acceptability of Triple P before implementing the program, and that the program be facilitated in partnership with Aboriginal and Torres Strait Islander child health workers.[19]

There is some evidence to suggest that home visiting helps prevent neglect, particularly first episode neglect, and particularly when used as part of a preventive multicomponent package including parent education and

possibly enhanced paediatric care.[33] Home visiting programs have been found to be most cost effective when they involve a multidiciplinary team and target high risk populations.[36,37] It has been suggested that interventions to prevent neglect should focus more on the community level – for example, by using media campaigns to promote a 'norm.' Neglect predicts future maltreatment, hence any interventions need to be sustained and ongoing.[38]

There is evidence that FAS (refer to Chapter 3: Child health, 'Fetal alcohol spectrum disorder'), independent of the effects of poor nutrition, is associated with growth deficits in children. Not drinking during pregnancy is the safest option.[39,40] Brief interventions have been shown to be effective in reducing alcohol use during pregnancy and in the postnatal period.[41]

There is evidence that providing multiple micronutrients (MMNs) to pregnant women improves birthweight, and may have other beneficial effects on pregnancy outcomes. Supplementation with single nutrients, however, does not appear to have the same effect on birthweight. Single micronutrient (MN) zinc supplementation given during pregnancy may decrease prematurity of infants but does not increase birthweight.[42]

In contrast, there is a lack of consistent evidence whether MMNs given to children in the first two years of life improves growth. One important systematic review found the research evidence supported neither implementation of new programs nor withdrawal of existing MMN supplementation programs.[22,23] Study variability is large, in terms of what was given, what dose, what duration, baseline characteristics of children, and whether MMNs were combined with other strategies to enhance growth. Some studies show that MMNs do not improve growth,[43–47] and others show that MMNs do improve growth.[10,17,48–50] There is still a lack evidence of any deleterious effects of MMN on children. It appears single MN have no effect on growth, though zinc supplementation is recommended by some Australian experts in cases of FTT to reduce infections, especially respiratory infections or chronic diarrhoea when given to children in the first year of life.[45,51–53] There are mixed data as to whether zinc supplements improved weight, but there are no data demonstrating that they prevent stunting or underweight. There is further evidence that zinc supplementation is of no benefit in preventing growth faltering.[22,23] There is evidence of benefit from vitamin A supplementation in populations with moderate to severe vitamin A deficiency.[22,23] Chemoprophylaxis using deworming regimes has also been shown to confer benefit to children living in areas known to have high rates of infestation.[18,22,23] Prophylactic albendazole appears to be well tolerated.

Nutrition education coupled with growth monitoring can improve a mother's knowledge of good diets, but may not translate into improved health outcomes for a child.[54] However, nutrition education has been noted to be very context specific,[46] and the potential for an impact on growth appears to be greater with interventions that combine nutritional information with provision of complementary food with or without fortification, or increased energy density of complementary foods. There is evidence suggesting that for nutritional counselling to be effective, it should involve[24] 'hands-on' skills development; be tailored to the educational level and needs of the mothers and families, and include strategies for behaviour change; and be ongoing and delivered by nutrition paraprofessionals and/or peer supporters. One important systematic review[22,23] found evidence that effective nutrition counselling was often part of a multifaceted intervention and involved education to not only carers, but also community health workers and community representatives. Parenting in Aboriginal and Torres Strait Islander communities often includes extended family and kin, and in particular acknowledges the role of grandparents in transmission of cultural knowledge and customs, so nutritional education is best provided at multiple levels in the community.[19] Postnatal peer support programs can reduce cessation of exclusive breastfeeding, as can face-to-face support from health professionals, some antenatal education and postnatal home visiting support. Written information such as leaflets is not very effective.[24] In the context of Aboriginal and Torres Strait Islander health, home visits to relay nutritional information are recommended.[10] There is evidence that improving doctors' knowledge and counselling skills around nutrition may be helpful in prevention of FTT.[10,22,25,41] There is also evidence that encouraging certain eating behaviours may be helpful in improving nutrition for children in low-income households. These include encouraging and supporting parents and carers to make home-prepared foods for infants and young children, without adding salt, sugar or honey; encouraging families to eat together, and encouraging parents and carers to set a good example by the food choices they make for themselves and advising parents and carers not to leave infants alone when they are eating or drinking.[24]

Interventions attempting to favourably alter the intake of nutrients include treating lactose intolerance.

However, in cases of acute diarrhoea, there is no benefit in using a non-lactose formula over a lactose-containing formula in the re-feeding period following rehydration in studies continued for up to seven days. Guidelines recommend confirmation of lactose intolerance with Clinitest™ tablets before treatment.[18,55]

There are similarities and differences in scientific versus lay perspectives on growth. Scientific perspectives generally focus on the extreme ends of poor health and look forward to adult outcomes, but lay perspectives tend to be more focused on framing discussions around what is normal and the current health status of the child. This may have implications for how healthcare providers should pitch discussions with carers of children at risk of FTT to promote maximum engagement in preventive strategies. It has been noted that children who are stunted may look 'normal' albeit young for their age. Caregivers may be unaware that their child's growth is compromised and that their idea of a 'norm' may not reflect a healthy nutritional status.[10,56,57]

Food insecurity is a major problem in many remote and urban Aboriginal and Torres Strait Islander communities (refer to Chapter 1: Lifestyle, 'Overweight and obesity'). Food insecurity involves a problem with both the supply of nutritious food, which can be limited in remote Australia, and a family's ability to access it. The latter may be compromised by high prices for fresh fruit and vegetables, poverty, not having a fridge, lack of transport to get to the shop, and excess expenditure on substances such as cigarettes, alcohol and other substances. Such problems need to be addressed by long-term cooperation and commitment of intersectorial bodies, working with local communities so that appropriate action plans can be enacted. Additionally, household sanitation is strongly associated with growth in children, and programs addressing issues of sanitation have shown a reduction in rates of stunting.[58]

Community feeding programs supply supplementary foods to children at risk of FTT, often on a population basis, although children can be individually targeted if there are risk factors for FTT. Food may be distributed for no cost through childcare centres and schools, over and above what is normally provided in such places or provided through health services. Such programs have been used to overcome food insecurity barriers, without the need to alter community infrastructure. Evidence for using community feeding programs is mixed. While one systematic review[22,23] states such programs should only be relatively short term and must be supported by the community, another review shows support for this approach.[17]

Recommendations: Growth failure

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All children	Recommend growth monitoring (including weight, length, head circumference, nutritional and psychosocial assessment) to coincide with child health visits for immunisation (Box 1) Use age and sex-appropriate Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) growth charts to monitor growth*	At age one week, six weeks, four, six, 12 and 18 months, then yearly to age five years Opportunistic as part of an annual health assessment from ages 5–18 years Monitor weight more frequently if there are concerns	IA	10, 18, 22–25, 54
	Preterm children and children with specific conditions (eg trisomy 21)	Recommend growth monitoring as above using condition-specific growth charts	As above	GPP	4, 59–61

Recommendations: Growth failure					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	All children	Discuss growth monitoring findings with the family, explaining how weight gains are linked to good health and always link the discussion with any nutritional intervention currently being undertaken	Opportunistic	IA	10, 17, 56, 57
Behavioural	All children	Assess developmental milestones (gross motor, fine motor, speech and language, social interactions) with growth monitoring checks Consider using parent report questionnaires and questions in the patient-held record† (refer to Chapter 3: Child health, 'Fetal alcohol spectrum disorder') Maintain a high index of suspicion in children with the following risk factors: possible fetal alcohol syndrome, microcephaly, convulsions and prematurity	At age one week, six weeks, four, six, 12 and 18 months, then yearly to age five years	IA	1, 25
	Mothers	Promote breastfeeding by discussing the health benefits, use of peer support, face-to-face health professional and postnatal home visits	Opportunistic	IB	24
	All families	Provide nutrition education counselling targeting both families and community workers	Opportunistic	IB	16, 19, 22–24
		Counselling should focus on behaviour change, be community driven and integrated with other preventive child health programs Consider referral to a dietitian if simple measures are not helpful		GPP	
	Children in families experiencing socioeconomic hardship or psychosocial stress	Provide home visiting support by referral to an early intervention program Ensure regular communication between primary healthcare staff and other agencies so that nutritional support programs are integrated with psychosocial support	Opportunistic	IA GPP	22, 23, 33, 62

Recommendations: Growth failure					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	Children living in areas with high rates of helminth infections	Recommend anti-helminth treatment with a single dose of albendazole Refer to the Australian *Therapeutic guidelines* for dosing regimen[63]	Opportunistic	IA	18, 22, 23 18, 22, 23
Environmental		Community food supplementation programs may be used on a short-term basis to overcome lack of food security, providing they have the support of the community and are part of a multifaceted intervention		IA	22, 23

*There are two main sets of sex-specific growth charts used in Australia: WHO charts for children aged 0–2 years, and CDC charts for children aged 2–18 years. The CDC charts include body mass index for age charts for those aged 2–18 years.[2,3] Correction for prematurity should continue until at least two years of age. Correction for prematurity must be made until 18 months of age for head circumference, two years for weight and 40 months for height. Measure length if <2 years and height if >2 years. Be sure equipment is calibrated and the taking of measurements is performed accurately.[22,23]

†There is no consensus on the correct developmental assessment tool to use with Aboriginal and Torres Strait Islander children, and none have been validated in Aboriginal and Torres Strait Islander populations. Parent-reported developmental assessment tools such as the Ages and Stages Questionnaire (ASQ) or Parents' Evaluation of Developmental Status (PEDS), or objective tools such as Denver Developmental Screening Test (DDST), may be used.

Box 1. Conducting a growth-monitoring action plan

- Document carer concerns and the barriers they perceive to breastfeeding and healthy nutrition.
- Explore issues of finances, transport, home storage (fridge) availability, numbers of people living at home, food preferences, food preparation equipment availability, facilities to maintain hygiene and hygiene practices.
- Involve the carer in coming up with solutions to problems, and focus on finding solutions that are practical and context-specific, paying particular attention to family needs and resources.
- Give information about appropriate weaning foods and amounts.
- Consider linking child to a team approach involving Aboriginal health workers, community nurse, family support worker and dietitian if there are indications that the child is at risk of failure to thrive or showing early signs of growth faltering.
- Begin the next health check by reviewing the previous action plan.

Resources

Growth charts for growth monitoring from the Royal Children's Hospital Melbourne:

- Growth charts, www.rch.org.au/childgrowth/Growth_Charts
- Down syndrome growth charts, www.rch.org.au/links/Growth_Charts_for_Down_Syndrome

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Childhood kidney disease

Background

The high rate of chronic kidney disease (CKD) is a significant reason for the health gap between Aboriginal and Torres Strait Islander peoples and other Australians. Aboriginal and Torres Strait Islander peoples have very high rates of self-reported long-term kidney disease (1.8%; nearly four times as high as non-Indigenous people based on age-standardised rates).[1] CKD accounted for 45% of hospitalisations for Aboriginal and Torres Strait Islander people in 2012–13, mostly for dialysis. Aboriginal and Torres Strait Islander people are admitted for dialysis at 10 times higher rates than non-Indigenous Australians.[1] CKD was an underlying cause or associated cause in one in every seven Aboriginal and Torres Strait Islander deaths between 2008 and 2012.[1]

Given the high rate of CKD in adulthood, there may be opportunities to prevent the trajectory to end-stage renal disease through interventions starting in childhood.[2–4] In one study, Aboriginal primary school-aged children had the same prevalence of persistent CKD risk factors (haematuria, proteinuria, obesity and hypertension-systolic or diastolic) as non-Aboriginal children,[4] while proteinuria was more common in Aboriginal people aged >20 years than in those aged 5–19 years.[5]

Prevention of CKD may need to commence from pregnancy. There is international epidemiological and experimental evidence that a predisposition to CKD in adulthood may arise from in-utero influences that result in low birth weight (LBW) (the fetal origins of adult disease hypothesis).[6] Mechanisms may be related to a reduced nephron endowment at birth (due to in utero epigenetic mechanisms) that enhances vulnerability to postnatal renal injury over time.[7] In an autopsy study, Aboriginal people from a remote community setting had much fewer nephrons and glomeruli than non-Aboriginal people, particularly when there was a history of hypertension, consistent with the finding that they have a susceptibility to renal failure.[8] However, this study was subject to selection bias and prenatal prevention strategies need to be complemented with postnatal strategies as described here.

There is mixed evidence on the extent to which childhood renal disease contributes to high CKD rates in Aboriginal and Torres Strait Islander adults. Risk factors for CKD seen in children, such as haematuria and proteinuria, are often transient,[2–4] with the exception of microalbuminuria in children with pre-pubertal and pubertal onset diabetes.[9,10] Baseline CKD risk factors are frequent in both Aboriginal and Torres Strait Islander and non-Indigenous primary school-aged children, although there is evidence that, at a single test, Aboriginal and Torres Strait Islander children have a greater risk of haematuria than non-Indigenous children.[4]

Higher rates of transient haematuria may reflect the higher incidence of transient diseases seen in Aboriginal and Torres Strait Islander children, particularly acute post-streptococcal glomerulonephritis (APSGN).[2–4] In some Aboriginal and Torres Strait Islander communities, children who had APSGN had six times greater risk of developing renal disease as adults,[11] although most children make an apparent full recovery from APSGN. It is not clear whether the link between APSGN and adult onset CKD is causative or associative. Prevention of end-stage kidney disease (ESKD) may be a goal of urinary tract infection (UTI) investigation and management. However, epidemiological data suggest only a very small association between UTI and ESKD, probably not causal,[12] and there has been no significant decrease in ESKD attributable to pyelonephritic scarring/reflux nephropathy since more aggressive investigation and treatment in the 1960s.[13] The major determinants of ESKD in Aboriginal and Torres Strait Islander adults continue to be cardiovascular disease (CVD) (13% prevalence),[1] diabetes (11% prevalence)[1] and obesity (37% prevalence)[1] rather than infections.

Interventions

Skin infections and kidney disease

There is some evidence that prevention and treatment of skin infections prevents APSGN.[14] Therefore, children with skin sores, and household contacts of such children, should be given targeted treatment with anti-scabetics and benzathine penicillin.[14]

Population-level recommendations for children in communities with a high prevalence of skin conditions are less clear. Regular community-based programs may be useful to screen and treat all children in a target

age group (eg ages 0–3 years)[11] for both scabies and infected sores. Simultaneous treatment of the whole community to remove scabies (a common precursor to streptococcal skin infection), followed by regular ongoing surveillance and treatment of scabies and skin sores (at least three times per year), may prevent streptococcal skin infections.[11] These interventions reduce skin sores, scabies and APSGN, and we assume this would reduce ESKD.[11,14,15]

Housing, overcrowding and swimming pools

There is evidence that dysfunctional housing facilities and overcrowding enhance the risk of skin, ear, respiratory and gastrointestinal infections in Aboriginal children.[16,17] The New South Wales Housing for Health program was a collaborative effort between Aboriginal community groups, land councils and NSW Health to upgrade essential housing needs for healthy living. People who received assistance from the Housing for Health program had a 38% reduction in hospitalisations for infections (skin, gut, respiratory and otitis media) in 2008 compared with 1998. This compared to a 3% increase per 10,000 population over the same time period for people who had not received assistance from Housing for Health.[18] A study from Bangladesh found that poor-quality housing and lack of electricity were associated with scabies in Bangladesh.[19] A reduction in the prevalence of skin sores in Aboriginal children has been reported in several pre–post studies as a beneficial effect of swimming pools and may be due to cleaning of the skin.[20,21] Although these are infection-related outcomes, it is likely that improvements in housing and overcrowding would also lead to improved kidney health outcomes, but specific evidence is lacking.

Prevention of recurrent UTI

There is lack of certainty regarding the usefulness of routine antibiotic prophylaxis following the first UTI. A large double-blind placebo-controlled trial found a modest 6% reduction in febrile UTI after one year of prophylactic daily cotrimoxazole and that children with vesico-ureteric reflux (VUR) were no more likely to benefit from prophylactic antibiotics than those without VUR.[22] Guidelines from the National Institute for Health and Care Excellence (NICE), Caring for Australians with Renal Impairment and the American Academy of Pediatrics (AAP) currently do not recommend using prophylactic antibiotics after the first UTI.[23–25] Prophylactic antibiotics remain an option for recurrent UTI. However, it is clear that asymptomatic bacteriuria in infants and children should not be treated with prophylactic antibiotics.[23,26]

There is no current evidence to support the use of cranberry juice[27] or probiotics to prevent UTIs.[28] Circumcision reduces the risk of UTI in boys[29] but is associated with some risk and so is not recommended routinely to prevent UTIs.

Imaging studies after UTIs

Renal ultrasound screening is recommended in children aged <6 months largely because it provides reassurance to families, is cheap and non-invasive. Despite this, there is no evidence that renal ultrasounds after a febrile UTI reduce progression to ESKD.[23] The AAP no longer recommends micturating cystourethrograms (MCUGs) after febrile UTIs,[30] and NICE only recommends MCUGs in infants aged <6 months with atypical or recurrent UTIs.[23] High-grade VUR is associated with kidney damage; however, there is no evidence that continuous antibiotic prophylaxis in children with VUR reduces scarring. The Randomized Intervention for Children with Vesicoureteral Reflux (RIVUR) trial, a randomised placebo-controlled trial involving 607 children with VUR, showed reduced UTI recurrence but no difference in renal scarring in children on prophylaxis.[31] A meta-analysis of eight trials, including the Prevention of Recurrent Urinary Tract Infection in Children with Vesicoureteric Reflux and Normal Renal Tracts (PRIVENT)[22] and RIVUR,[31] showed reduced UTI recurrence but no difference in renal scarring rates in children with VUR given prophylactic antibiotics.[32] Some of the kidney damage caused by high-grade VUR occurs prenatally.[33] The incidence of VUR is increased in siblings and children of those with VUR; however, there is no evidence that screening for VUR in these sub-groups will result in any benefit as the value of identifying and treating VUR is unproven.[34]

Blood pressure screening

There is mixed evidence as to whether blood pressure screening to detect renal disease should be performed in children. Some evidence supports screening children yearly from the age of three years, and younger if there are risk factors for high blood pressure such as obesity.[35] However, this screening is not primarily recommended

for the purposes of screening for renal disease in children, nor is it solely recommended so that treatment can prevent renal damage; rather, it is primarily targeting prevention of cardiovascular disease. The RACGP *Guidelines for preventive activities in general practice* (Red Book) makes no specific recommendations about screening for blood pressure in children.[36] The most recent AAP statement recommends screening all children aged ≥3 years annually, and those at high risk (obesity, medications known to increase blood pressure, renal disease, a history of aortic arch obstruction or coarctation, or diabetes) at every visit. However, these recommendations are based on grade C quality evidence and classified as only 'moderate' strength.[37]

The measurement of blood pressure in all young children has not been linked to strong evidence of improvements in diagnosis and treatment of renal disease, and may be problematic for a variety of reasons. The practice of measuring blood pressure is more complicated in children than in adults. It can be difficult to ensure accurate readings and the correct interpretation of values is vulnerable to equipment and practitioner error. Therefore, community-based blood pressure screening would be difficult and, given the current lack of evidence, it would be better to divert energy into screening practices with a stronger evidence base.

When taking a blood pressure, we recommend:

- using the manual technique rather than automated devices
- choosing the correct cuff size
- referring to the normal ranges based on age, gender and height (refer to 'Resources')
- repeating if abnormal and referring for appropriate work-up if hypertension is confirmed.

Urinalysis screening

Single estimations of urinary blood and protein in children vary according to posture, illness, exercise and time of day. Screening urinalysis is costly to the community, may result in physical and psychological costs to the patients and their families, and is prone to misinterpretation. Urinalysis screening of all children is not recommended.[38]

Recommendations: Childhood kidney disease					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	All children without a high-risk condition	Routine urinalysis or blood pressure screening for kidney disease is not recommended unless there is a clinical indication		IA	2–4, 23, 35, 38
	Children with a high-risk condition (obese/ overweight, renal disease, congenital heart disease, strong family history)	Routine urinalysis and blood pressure surveillance is advisable. For children with diabetes, refer below	Opportunistic	GPP	37
	Children with asymptomatic proteinuria	Routine renal ultrasound examination is not recommended		IA	23
	Children living in areas with high rates of infectious skin disease (scabies and impetigo)	Check the skin for scabies and impetigo and treat according to management guidelines (refer to 'Resources')	Opportunistic and as part of annual health assessment	GPP	11, 39
	Children with first episode urinary tract infection (UTI)	Assess need for imaging tests based on treatment response within 48 hours and whether atypical features are present (Box 2)		IB	34

Recommendations: Childhood kidney disease					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	Children with pre-pubertal and pubertal onset diabetes	Check albumin to creatinine ratio (ACR) using single voided specimen, morning specimen preferred. Abnormal screening tests should be repeated as microalbuminuria may be transient Check blood pressure annually	At age 10 years or at puberty (whichever is earlier), after 2–5 years' diabetes duration, then annually thereafter	IA	9, 10
Behavioural	Children who have had at least one episode of UTI	Identify and correct predisposing factors for recurrence (including constipation, dysfunctional elimination syndromes, poor fluid intake, and delays in voiding)	As needed	IA	23
Chemo-prophylaxis	Children living in areas with high rates of infectious skin disease (scabies and impetigo)	Treat household contacts of someone with scabies with 5% permethrin cream if aged >2 months, and sulphur 5% or crotamiton cream if aged <2 months In communities where there are outbreaks of infected scabies, offer all household contacts of people with impetigo a single dose of benzathine penicillin G (refer to 'Resources')	As needed	IIIC	14
	Children with recurrent UTIs	There is insufficient evidence to routinely recommend probiotic therapy or cranberry products for the prevention of recurrent UTIs		IA	27, 28
		Routine prophylactic antibiotics are not required, even if the child has vesicoureteric reflux	If used: daily for 12 months, then review	IA	
	Children with asymptomatic bacteriuria	Antibiotics are not recommended		IA	
Environmental	Children living in areas with high rates of infectious skin disease (scabies and impetigo)	Promote good hygiene practices at home Refer to relevant housing support services to reduce overcrowding and promote access to adequate washing facilities Recommend the regular use of community swimming pools	Opportunistic	GPP IB	11 20

Recommendations: Childhood kidney disease					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Environmental	Children living in areas with high rates of infectious skin disease (scabies and impetigo)	Community-based interventions that use screening and immediate treatment of skin sores and scabies in targeted age groups should be combined with simultaneous treatment of the whole community for scabies (refer to 'Resources')		IA	11, 14

Box 1. Acute management of children with UTI/pyelonephritis*† (CARI guidelines)[25,40]

Child with asymptomatic bacteriuria (ie bacterial growth in urine with no symptoms)		
No treatment is required[25,26]		
Child with presumed UTI (ie symptoms and +ve leucocytes and/or nitrites on urinalysis)		
Low risk (not septic, can tolerate oral medications)		
Age	**No pyelonephritis** (ie cystitis)	**Pyelonephritis** (fever >38°Cwith loin pain/tenderness)
<1 month	IV antibiotics	IV antibiotics
≥1 month	Oral antibiotics for 2–4 days	Oral antibiotics for 7–10 days
High risk (septic, cannot tolerate oral medications)		
	No pyelonephritis	**Pyelonephritis** (fever >38°C with loin pain/tenderness)
All ages	IV antibiotics	IV antibiotics

IV, intravenous; UTI, urinary tract infection

*NICE guidelines[23] are very similar, but use a three-month rather than a one-month age cut-off.

†AAP guidelines[24] are similar, but recommend a minimum seven-day antibiotic course for all children with UTI.

Box 2. Investigations for children with first UTI/pyelonephritis[23]

Atypical (any of the following) • patient seriously ill • poor urine flow • abdominal or bladder mass • raised creatinine • septicaemia • failure to respond to treatment with suitable antibiotics within 48 hours • infection with non–*Escherichia coli* organisms
Infants aged <6 months: MCUG* if atypical UTI or recurrent UTIs Children aged <3 years: Renal ultrasound during acute infection + DMSA scan† in 4–6 months Children aged ≥3 years: Renal ultrasound during acute infection
Typical (ie does not meet any of above atypical criteria)
Infants aged <6 months: Renal ultrasound within six weeks Children aged ≥6 months: No investigations required
DMSA, dimercaptosuccinic acid; MCUG, micturating cystourethrogram; UTI, urinary tract infection *MCUG should not be performed routinely, but should be considered if there is dilatation on ultrasound or poor urine flow. †DMSA scan – an intravenous radionuclide scan for assessing renal function.

Resources

- Caring for Australasians with Renal Impairment (CARI), Chronic kidney disease guidelines, www.cari.org.au/CKD/ckd_guidelines.html
- Central Australian Rural Practitioners Association (CARPA), Remote primary health care manuals, www.remotephcmanuals.com.au/home.html
- Centre for Disease Control, Department of Health (NT), *Healthy Skin Program: Guidelines for community control of scabies, skin sores and crusted scabies in the Northern Territory*, http://digitallibrary.health.nt.gov.au/prodjspui/bitstream/10137/698/1/Healthy%20Skin%20Program%202015.pdf
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Fetal alcohol spectrum disorder

Background

Fetal alcohol spectrum disorder (FASD) represents a range of cognitive, behavioural and physical impairments that can occur due to prenatal alcohol exposure. While alcohol is toxic to all fetal cells and may cause defects of the kidneys, heart, lungs, eyes, ears, skin and musculoskeletal system, the developing brain is particularly sensitive.[1,2] FASD is a leading, preventable cause of intellectual disability.[3,4] Alcohol exposure at any time during pregnancy may result in damage to the developing fetal central nervous system.[5] The effects of FASD are severe and pervasive, defined as significant abnormalities of three or more domains of central nervous system structure and/or function, with or without characteristic facial features.[6] Impairments may vary across the life course, and most often include impairments in neurocognitive functioning, behaviour and affect regulation, and difficulties handling the demands and activities of daily life.[7,8]

The neurodevelopmental impairments characteristic of FASD can lead to significant social, emotional and occupational difficulties.[9–12] A study of children residing in remote Western Australian communities found that teachers reported higher rates of problematic behaviour in children with FASD compared to children without FASD. In this study, teachers were blinded to reports of prenatal alcohol exposure and also FASD diagnoses. However, the teachers were significantly more likely to report academic failure, attention problems and talk about suicide in children with FASD compared to those without FASD.[13] Individuals with FASD are at high risk for disrupted education,[2] mental health and substance abuse problems,[2,14] and engagement in the justice system.[2,15] The impacts of FASD continue into adulthood, and development of a diagnostic approach beyond the paediatric population is required. Interventions and support for individuals with FASD should be made available across the lifespan and be dynamic and responsive to life changes. In addition, interventions should focus on the brain-based nature of impairments, involve families and take a strengths-based approach, and be culturally secure.[16]

Screening for alcohol use in pregnancy, and offering appropriate intervention or referral to a specialist alcohol treatment service, is an important strategy to prevent FASD.[17] Diagnosis and early intervention are crucial to understanding the affected individual's impairment, their unique and special needs, and provides an explanation of the cause of their problems.[18,19] Understanding can facilitate acceptance of impairments by individuals and carers, and motivate responsibility for ongoing support in families and service providers.[20]

Alcohol use in pregnancy

Alcohol consumption is common among Australian women, including women of childbearing age. National survey data suggest that approximately 50–60% of Australian women drink in pregnancy.[21,22] Most pregnant women report ceasing drinking alcohol once they find out that they are pregnant. However, one in four continue to drink even once they know they are pregnant. Of those who continue to drink, 96% report drinking 1–2 standard drinks on a typical drinking occasion.[21]

Although data from a large national survey indicate that only 20% of Aboriginal and Torres Strait Islander women drink in pregnancy,[23] it has also been reported that a greater proportion of Aboriginal and Torres Strait Islander women (compared to non-Indigenous women) drink alcohol at high-risk levels.[21] Population-based data reported from the Lililwan FASD prevalence study conducted in remote Fitzroy Valley communities of Western Australia found that high-risk alcohol use in pregnancy was common. In this study, alcohol use during pregnancy was reported in over half (55%) of birth mothers. Of these, the majority (88%) consumed alcohol in the first trimester. However, 53% of those who drank alcohol during pregnancy did so in all three trimesters. Complete data on frequency and amount of alcohol consumption (available for 91% of birth mothers) identified that episodic high-risk drinking was most common among the women who drank alcohol in pregnancy. Of these women, 27% consumed more than 10 standard drinks on a drinking occasion 2–3 times per week, and a further 27% consumed more than 10 standard drinks on a drinking occasion 2–4 times per month.[24] These communities have taken action to address this high prevalence of alcohol use, and there has been a marked reduction in reported drinking in pregnancy between 2010 and 2017 (unpublished data from the Marulu FASD Prevention Strategy project).

Making a diagnosis of FASD

Diagnostic terminology for FASD has evolved over time, with categories including fetal alcohol syndrome (FAS), partial fetal alcohol syndrome (pFAS), and neurodevelopmental disorder-alcohol exposed (ND-AE) previously being used.[9] Recently, the Australian Government endorsed the *Australian guide to the diagnosis of fetal alcohol spectrum disorder (FASD)* (refer to 'Resources'),[6] diagnostic categories from which are summarised in Figure 1.

The diagnostic terminology has been simplified to include two diagnostic categories of FASD, with or without three sentinel facial features (short palpebral fissures, smooth philtrum, thin upper lip). Severe impairment (scoring two or more standard deviations below the mean or less than the third percentile on standardised assessments) in at least three neurodevelopmental domains listed in Figure 1 is necessary for a diagnosis. Generally, confirmed prenatal alcohol exposure is required to make a diagnosis. However, where all three sentinel facial features are present, along with severe neurodevelopmental impairment, a diagnosis may be made without confirmation of prenatal alcohol exposure (Figure 1). Importantly, an affected individual may not have sentinel facial features but may still experience severe functional limitations and meet criteria for FASD.

Figure 1. Diagnostic criteria and categories for fetal alcohol spectrum disorder (FASD)

Diagnostic criteria	Diagnostic categories	
	FASD with 3 sentinel facial features	FASD with <3 sentinel facial features
Prenatal alcohol exposure	Confirmed or unknown	Confirmed
Neurodevelopmental domains • Brain structure/neurology • Motor skills • Cognition • Language • Academic achievement • Memory • Attention • Executive function, including impulse control and hyperactivity • Affect regulation • Adaptive behaviour, social skills or social communication	Severe impairment in at least 3 neurodevelopment domains	Severe impairment in at least 3 neurodevelopmental domains
Sentinel facial features • Short palpebral fissure • Smooth philtrum • Thin upper lip	Presence of 3 sentinel facial features	Presence of 0, 1 or 2 sentinel facial features

Reproduced from Bower C, Elliott E, on behalf of the Steering Group. Report to the Australian Government Department of Health: Australian guide to the diagnosis of fetal alcohol spectrum disorder (FASD). Perth: Telethon Kids Institute; Canberra: Department of Health, 2016.

Making a diagnosis of FASD requires a multidisciplinary approach and specialist assessment.[6,25] As yet, there is no specific biomarker for prenatal alcohol exposure, and the history and examination is of importance to ascertain exposure risk to the child or adult, and to consider or exclude alternative or co-diagnoses.[26–28] Neurocognitive profiles in FASD often overlap with attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD), speech and language disorders, mental health disorders, conduct disorder, and oppositional defiant disorder.[29–31] FASD is often diagnosed in the context of other risk factors, and differentiating the relative impact of these is complex and difficult. Some diagnoses, such as ADHD, intellectual disability, conduct disorder or ASD, may co-occur with, or be a consequence of, the effect of prenatal alcohol exposure.[14,29,31] Early life trauma or neglect, and some genetic abnormalities, are associated with behavioural and cognitive impairments, and acquired brain injury from trauma, infection or metabolic conditions may present a similar neurodevelopmental profile to that seen in FASD.[26–28]

Groups at high risk of missed FASD diagnosis include children in foster or adoptive care,[32] and youth who have come into contact with the law.[15] Due to the significant language impairments seen in FASD, assessment prior to sentencing is important so that language limitations can be accommodated in court processes.[33] The first Australian study to estimate the prevalence of FASD among youth in detention is currently underway in Western Australia. Findings from this study will inform the development of a screening tool for use with young people entering detention.[34]

Doctors are often untrained in making a FASD diagnosis, and there may be concerns among clinicians that a label of FASD will stigmatise the mother and affected individual. Clinicians may also have the belief that there is little that can be done to alleviate the effects of FASD. For these reasons, there may be a reluctance to ask about prenatal alcohol exposure.[35] This situation can be disadvantageous for the person with FASD as it limits their opportunity to access services and support. FASD is often diagnosed in middle childhood, as learning and behavioural difficulties often become more apparent when children enter early schooling. This is especially the case for children with milder impairments, and those without the characteristic facial features.[36] Special consideration is needed for adolescents and adults living with FASD. In this population there may be less opportunity for diagnosis due to a number of factors, including limited health professionals diagnosing in adulthood, changes in physical characteristics that occur with age, and difficulties obtaining information about the pregnancy.[6]

In view of these issues, the diagnostic process requires a multidisciplinary team, ideally including a paediatrician, neuropsychologist, occupational therapist, speech and language pathologist, and social worker.[6,25] This is not always feasible due to a lack of services in regional and remote areas of Australia. Therefore, a more streamlined approach to diagnosis, for instance by a paediatrician and neuropsychologist, may be adopted. The diagnostic team can also vary depending on age and setting.[6] In younger children (aged <5 years), diagnosis may be made by a paediatrician conducting developmental testing. In adolescence and adulthood, a medical practitioner, neuropsychologist, and speech and language pathologist may constitute an appropriate diagnostic team.[37] As diagnosis in adulthood is not readily available in Australia, a paediatrician with specialist expertise in FASD may support the diagnostic team. Where mental health disorders are suspected, confirmation of these diagnoses by consultation with a psychiatrist may be required.

In Aboriginal communities where English is not a first language, assessments need to be minimally biased by culture and language (eg using non-verbal cognitive assessments, and working with interpreters and cultural consultants).[6] The assessment process includes comprehensive history-taking to consider or exclude other exposures (prenatal or postnatal), and consideration/investigation for other risk factors (eg trauma, illness, structural central nervous system abnormality, genetic or metabolic conditions, anaemia, thyroid deficiency).[6] In remote or regional settings, GPs may liaise with paediatricians via telehealth to seek advice on screening, diagnosis and management.

Multiple services with expertise in FASD diagnosis and training now operate within the Australian and New Zealand FASD Clinical Network (refer to 'Resources') as resources to increase diagnostic activity.[38] GPs can refer to a paediatrician and multidisciplinary team for formal assessment of neurodevelopment or FASD, including using a GP Mental Health Treatment Plan, GP Management Plan, or Team Care Arrangement. Specific item numbers for FASD diagnosis are not currently included within the Medicare Benefits Schedule (MBS); however, clinicians are advocating for this as it is believed that this will facilitate FASD diagnostic activity.

Neurodevelopmental profiles of individuals with FASD may change over time or become more pronounced at key transition points during development (eg when entering school or the workforce), and reassessment by relevant services over the life course is often required. Early intervention aims to improve neurodevelopment and functional outcomes and reduce social and mental health problems later in life.[16] A coordinated approach to assessment and diagnosis will facilitate the selection of appropriate interventions. A process of referral, assessment, intervention, review, and reassessment with ongoing case coordination is recommended.[16] Models of care for FASD screening, referral and diagnosis have been developed in some regions.[39,40] In 2017 the Australian Government committed funding to increase FASD diagnostic capacity nationally, and a consultation process was initiated to develop the Australian FASD Action Plan 2018–2028.

Interventions

Primary prevention strategies to reduce alcohol use in pregnancy

Prevention interventions should be targeted to women of childbearing age and their partners, and women with alcohol dependency.[39] The environment the woman is situated within is important to ascertain alcohol exposure risk. For example, studies have indicated that women are more likely to drink alcohol during pregnancy when living with a partner who consumes alcohol.[41] The role of partners and family therefore deserves considerable attention in preventive management. Various primary prevention strategies have been adopted in Aboriginal communities and primary healthcare settings that take a whole-of-community approach to prevent risky drinking (refer to Chapter 1: Lifestyle, 'Alcohol'). These strategies include school and family education programs, efforts to improve access to antenatal care, women's support groups, the provision of alternative activities to drinking, warning labels on alcohol, and restricting access to the supply of alcohol.[42]

Secondary prevention: Early detection and screening for risky drinking

In the primary care setting, screening to assess both the quantity and frequency of alcohol use in routine interviews with all women of childbearing age is important.[43,44] This is especially the case for women planning a pregnancy.[39,45] Appropriate history-taking and screening tools for risky drinking can be used. The Alcohol Use Disorders Identification Test – Consumption (AUDIT-C) is a valid screening tool suitable for primary healthcare settings, with high sensitivity and specificity for identifying harmful drinking,[46,47] but other tools for risky drinking are also available (refer to Chapter 1: Lifestyle, 'Alcohol').

Those identified as at risk should be provided with appropriate information about the risks of alcohol use in pregnancy and while breastfeeding. Contraceptive advice to reduce unplanned pregnancy should also be offered (refer to Chapter 4: The health of young people, 'Unplanned pregnancy').[17,39] Use of brief intervention techniques by health professionals may be effective at reducing risky drinking when it is identified and where dependency is not yet apparent (refer to Chapter 1: Lifestyle, 'Alcohol'). Where dependency is identified, referral to specialist addiction services focusing on more intensive treatment is necessary.[17,39,45]

There is good evidence for the use of brief interventions to reduce alcohol consumption in the general population.[48] However, in Australia there have been limited studies of screening and brief intervention for women who are pregnant and use alcohol.[49] International studies examining the effect of brief alcohol interventions generally find reduced drinking and improved outcomes for pregnant women.[50–52] For example, a cluster randomised trial in the US found that women receiving brief interventions were five times more likely to report abstinence by their third trimester when compared to women who only received screening. For the women who received brief interventions, the occurrence of fetal death was also much lower.[50] Studies also show that pregnant women in control groups (who receive screening, but not brief intervention) report reducing their alcohol consumption.[50–52] These findings may indicate that for some women, screening can heighten awareness of the consequences of drinking alcohol. However, it is also possible that the reduction in reported consumption is an effect of social desirability.[53,54]

Reporting of alcohol use at the time of pregnancy is likely to be associated with feelings of guilt or shame,[55] and therefore needs to be addressed with consideration and sensitivity by practitioners. Health professionals should understand and acknowledge how colonisation, dispossession and the forced removal of children have affected the health of Aboriginal and Torres Strait Islander peoples over successive generations.[49] Aboriginal and Torres Strait Islander women may not disclose alcohol use to health professionals due to fear of intervention by government agencies.[56] A sensitive and supportive 'no blame, no shame' approach to both screening for alcohol use in pregnancy and to taking a child development history of prenatal exposures should be adopted. Individuals with FASD who have substance use problems may face significant barriers to accessing substance use treatment and care, and therefore be at risk of having alcohol-exposed pregnancies. Awareness of the cognitive and behavioural challenges faced by individuals with FASD will enable support programs to be tailored to individual needs. For example, it is important for service providers and health professionals to recognise that non-adherence to care plans may be an effect of FASD, and modifications or accommodations in programs will likely need to be made.[57]

Resources to guide practitioners to sensitively and appropriately ask about alcohol with the patient are available (refer to 'Resources'). These resources include Women Want To Know and the FLAGS (feedback, listening, advice, goals, strategies) brief intervention model.[46]

Therapy and support for those diagnosed with FASD

Early diagnosis or practitioner awareness of prenatal alcohol exposure, along with an understanding of neuropsychological deficits before six years of age, is an important factor associated with improved long-term outcomes for individuals with FASD.[2] Interventions for FASD include pharmacological treatments, caregiver support programs, language and educational interventions, social skills development and behavioural strategies. Systematic reviews of the effects of these interventions are inconclusive due to problems with inadequate study designs, a small number of studies and sample sizes employed, and lack of long-term follow-up data on outcomes.[58,59]

While the evidence base is limited and largely restricted to school-aged children, interventions targeting self-regulation and attentional control in early to middle childhood have shown improvements in neuropsychological functioning in children affected by FASD. Additional caregiver reports of behaviour[60–62] suggest that neurocognitive rehabilitation is a promising intervention for children.[63] The Alert Program® focuses on self-regulation skills by teaching children to manage their arousal levels, and has recently been piloted for feasibility in remote Western Australian schools. Future implementation and evaluation of this program aims to provide evidence about the efficacy of self-regulation interventions in Aboriginal communities where the prevalence of FASD among children is of concern.[64] Interventions addressing social skill deficits have also demonstrated some effectiveness.[59] Studies evaluating Children's Friendship Training (CFT), a parent-assisted social skills program for primary school kids, found improved social skills compared to a control group post-intervention.[65–67] Strategies designed to help caregivers improve parenting skills and manage challenging behaviours in children have been found to decrease caregiver stress and improve coping skills.[59] An evaluation of Families Moving Forward (FMF), a parenting program developed in the US, found significant improvement in parenting self-efficacy and inparent's reports of children's behaviour.[68]

Australia has few FASD-specific therapy programs or providers, but there are existing mainstream therapy programs (eg those targeting ADHD, sensory processing issues, behavioural dysregulation, language impairment) that are appropriate for the domain-specific impairments commonly seen in FASD. However, the inclusion of FASD psychoeducation regarding the brain-based (as opposed to behavioural) nature of impairment in FASD is important. A focus on making accommodations (scaffolding in the learning environment) and tailoring therapy to the cognitive level of those affected is likely to increase the efficacy of any therapy approach.[16] Living independently is a challenge for adults with FASD,[2] therefore supported living arrangements, modifications to workforce training and ongoing vocational support may be required.[35]

Given the overlap in behavioural symptoms between FASD and ADHD, drug treatments for FASD have largely focused on stimulant medications. Studies examining the effects of stimulant medications on ADHD symptoms in children with FASD have shown improvements in symptoms of hyperactivity, but not in attention.[58] Medication should be tailored to the needs of the individual and be compliant with prescribing stimulant medicine guidelines. Further, medications should be part of a broader multimodal treatment plan that includes educational and psychological interventions, and specialist consultation is recommended.[69] Specialist advice should be sought on medication treatment in FASD, as symptoms of inattention and hyperactivity may co-exist with anxiety or behavioural dysregulation, and a more nuanced treatment approach may be needed.

Overall, successful outcomes are more likely when interventions supporting both the individual with FASD and family/carers are implemented alongside each other. Integrating interventions into existing systems such as local and early childhood intervention services, school-based education and the regular home environment has been associated with success.[68] A number of factors may influence access to services and also the delivery of services.[16] These include language and cultural differences, challenges of service delivery in remote communities and of understanding lived histories, cultural dislocation, and the impact of intergenerational trauma for Aboriginal and Torres Strait Islander peoples in Australia.[70,71] The

cultural beliefs of Aboriginal and Torres Strait Islander peoples should be explored in standard practice so that erroneous assumptions are not made by practitioners.[72] Consulting with local communities from the outset, and focusing on community capacity building, is likely to more effectively engage affected individuals and families.[43]

Recommendations: Fetal alcohol spectrum disorder – Recommendations for women

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	Women who are pregnant or planning pregnancy	Screen for risky drinking and alcohol use by taking an appropriate history. This can also involve use of the Alcohol Use Disorders Identification Test – Consumption (AUDIT-C) questionnaire or other tools to assess risky drinking (refer to Chapter 1: Lifestyle, 'Alcohol')	At diagnosis of pregnancy and in each trimester	IB	45, 46
Behavioural	All women of childbearing age	Provide advice consistent with National Health and Medical Research Council (NHMRC) recommendations on reducing alcohol related health risks (refer to Chapter 3: Child health, 'Childhood kidney disease', and Chapter 9: Respiratory health) Provide contraceptive advice	As part of annual health assessment Opportunistic	IB	45, 46
	Women who report any alcohol use prior to or during pregnancy	Conduct brief intervention (Box 1) to reduce alcohol consumption and use motivational interviewing techniques (refer to 'Resources' for recommended tools)	On each antenatal visit	IIB	49
	Women with drug and alcohol use problems	Provide referral to an addiction medicine specialist or alcohol/drug treatment service for counselling, withdrawal management and pharmacotherapy	On each antenatal visit Opportunistic	IB GPP	45, 46 17
Environmental	Communities where high-risk alcohol use is prevalent	Promote broader community-level strategies to reduce alcohol. These include: • advocacy for 'dry' communities • floor pricing on alcohol • support for restrictions to liquor licensing laws • support for community-led programs that strengthen and support families, and that build capacity in community members and health organisations		GPP	39, 73

Recommendations: Fetal alcohol spectrum disorder – Recommendations for children at risk					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	All children	Assess child growth and development, particularly head circumference, hearing and vision (refer to Chapter 3: Child health, 'Growth failure')	Opportunistic and as part of annual health assessment in low-risk, non–alcohol-exposed pregnancies	GPP	74
	All children exposed to alcohol in the prenatal period (AUDIT-C score >0 in any trimester), if there is parental or clinician concern about the child not meeting normal developmental milestones (refer to 'Resources')	Assess child development and behaviour using a validated assessment tool including for child social and emotional well being (refer to 'Resources') Refer to a paediatrician for developmental assessment, or a child development service for multidisciplinary assessment (Figure 1)	Opportunistic and as part of annual health assessment	GPP	2, 6 75
	All children at high risk for FASD, including children coming into contact with the child protection, police or justice systems	Screen for prenatal alcohol exposure Screen for cognitive, language, and behavioural problems	On initial contact with child protection, police or justice systems	GPP	15, 76, 77
Behavioural	Families or carers supporting a person living with FASD School-aged children with FASD	Refer to a parent/ caregiver support program Refer to allied health specialist or therapy-focused services, especially those offering interventions targeting executive function (eg mental processes involved in planning, attention, remembering instructions and managing multiple tasks)		IIC GPP IIB	59 16 59
	Children with FASD	Consider specialist referral (paediatrician, child/ adolescent psychiatrist, neurologist) to assess the need for medications for hyperactivity, sleep or mood disorders, seizures or behavioural problems		IIIB	69

Box 1. The FLAGS framework for brief intervention (to guide practitioners to sensitively and appropriately ask about alcohol)

Feedback	Provide individualised feedback about the risks associated with continued drinking, based on current drinking patterns, problem indicators, and health status. Discuss the potential health problems that can arise from risky alcohol use.
Listen	Listen to the patient's response. This should spark a discussion of the patient's consumption level and how it relates to general population consumption and any false beliefs held by the patient.
Advice	Give clear advice about the importance of changing current drinking patterns and a recommended level of consumption. A typical five to 10 minute brief intervention should involve advice on reducing consumption in a persuasive but non-judgemental way. Advice can be supported by self-help materials, which provide information about the potential harms of risky alcohol consumption and can provide additional motivation to change.
Goals	Discuss the safe drinking limits and assist the patient to set specific goals for changing patterns of consumption. Instil optimism in the patient that his or her chosen goals can be achieved. It is in this step, in particular, that motivation-enhancing techniques are used to encourage patients to develop, implement and commit to plans to stop drinking.
Strategies	Ask the patient to suggest some strategies for achieving these goals. This approach emphasises the individual's choice to reduce drinking patterns and allow them to choose the approach best suited to their own situation. The individual might consider setting a specific limit on alcohol consumption, learning to recognise the antecedents of drinking, and developing skills to avoid drinking in high-risk situations, pacing one's drinking and learning to cope with everyday problems that lead to drinking.

Reproduced from Haber P, Lintzeris N, Proude E, Lopatko O. Guidelines for the treatment of alcohol problems. Canberra: Department of Health and Ageing, 2009. Available at www.health.gov.au/internet/main/publishing.nsf/Content/0FD6C7C289CD31C9CA257BF0001F96BD/$File/AustAlctreatguidelines%202009.pdf [Accessed 15 January 2017].

Resources

- Department of Health, 'Information for health professionals on assessing alcohol consumption in pregnancy using AUDIT-C', www.alcohol.gov.au/internet/alcohol/publishing.nsf/Content/wwtk-audit-c
- Mental Health Commission, Government of Western Australia, 'An introduction to fetal alcohol spectrum disorders (FASD)' (updated e-learning module), http://aodelearning.mhc.wa.gov.au/course/index.php?categoryid=6
- Telethon Kids Institute, Australian and New Zealand FASD Clinical Network, https://alcoholpregnancy.telethonkids.org.au/resources/health-professionals/australian-fasd-clinical-network
- Telethon Kids Institute and Department of Health, *Australian guide to the diagnosis of fetal alcohol spectrum disorder (FASD)*, https://alcoholpregnancy.telethonkids.org.au/alcohol-pregnancy-and-breastfeeding/diagnosing-fasd/australian-guide-to-the-diagnosis-of-fasd/

Specific resources to conduct brief interventions

- Department of Health, *Guidelines for the treatment of alcohol problems* (includes FLAGS brief intervention model), www.alcohol.gov.au/internet/alcohol/publishing.nsf/Content/guidelines-treat-alc-09
- Department of Health, Women Want to Know, www.alcohol.gov.au/internet/alcohol/publishing.nsf/Content/wwtk-resources

- Drug and Alcohol Office WA, 'Strong Spirit Strong Future: Promoting healthy women and pregnancies', A culturally secure training and education resource for health professionals (WA only); for training, email AOD.training@mhc.wa.gov.au
- National Drug and Alcohol Research Centre, University of NSW, *Supporting pregnant women who use alcohol or other drugs: A guide for primary health care professionals*, https://ndarc.med.unsw.edu.au/sites/default/files/ndarc/resources/Supporting%20Pregnant%20Women%20who%20use%20Alcohol%20or%20Other%20Drugs%20Resource.pdf
- NSW Health, 'Information for health professionals: Advising Aboriginal women about alcohol and pregnancy', https://yourroom.health.nsw.gov.au/publicationdocuments/1.FASD-guide-for-health-workers.pdf
- NT Government, Remote Alcohol and Other Drugs Workforce Program, 'Yarning about alcohol and pregnancy: Staff advice card', www.remoteaod.com.au/sites/default/files/images/Yarning%20about%20Alcohol%20and%20Pregnancy%20Advice%20Card%202015.pdf

Validated screening tools for child development and social and emotional wellbeing

- Department of Health, National framework for universal child and family health services, 'Developmental surveillance and health monitoring',_www.health.gov.au/internet/publications/publishing.nsf/Content/nat-fram-ucfhs-html~framework~core-elements~development_

Specific tools

- Ages and Stages Questionnaires (ASQ), http://agesandstages.com
- Royal Children's Hospital Melbourne, Centre for Community Health, 'Parents' Evaluation of Developmental Status (PEDS)', www.rch.org.au/ccch/resources_and_publications/Monitoring_Child_Development

Assessing child developmental milestones (0–5 years)

- Centers for Disease Control and Prevention, CDC's milestone tracker (application for IOS to assess developmental milestones in children aged two months to five years), https://itunes.apple.com/us/app/cdcs-milestone-tracker/id1232718688?mt=8
- Doctor Guidelines, 'Child development assessment – Developmental milestones and Denver Developmental Screening Test', http://doctorguidelines.com/2016/08/03/child-development-assessment-developmental-milestones-and-denver-developmental-screening-test
- Queensland Health, 'The "Red Flag" early intervention referral guide for children 0–5 years' (developed by Queensland Health, adapted by the Central Queensland Hospital and Health Service), www.health.qld.gov.au/__data/assets/pdf_file/0015/160701/red-flag-a3-poster-banana.pdf

Other resources for information about FASD

- FASD Hub Australia, https://fasdhub.org.au
- National Organisation for Fetal Alcohol Spectrum Disorders (NOFASD Australia), http://www.nofasd.org.au

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Preventing child maltreatment – Supporting families to optimise child safety and wellbeing

Background

Child maltreatment, or abuse, is defined as a failure to provide for the basic physical, emotional, health and/or educational needs of a child, including the failure to protect a child from harm. Some definitions also include the witnessing of family violence.[1,2] It is commonly categorised into four types:

- physical abuse
- sexual abuse
- emotional abuse
- neglect.

The development of children is profoundly shaped by the quality of relationship with their caregivers. Children are more likely to thrive within loving environments, being looked after by at least one attuned and responsive caregiver.[3] This occurs primarily, but not necessarily exclusively, within the family context and means that the capability of parents to care for children is a key factor in the primary prevention of child maltreatment.[4] There is substantial evidence of the negative impact on quality of life and lifelong health from child maltreatment and neglect,[5–7] and of the importance of early intervention to positively influence life trajectory, long-term health and other outcomes.[8–11]

The true prevalence of child maltreatment is difficult to establish for several reasons:

- Child maltreatment usually occurs in the context and dynamics of family relationships that are largely private and unobserved.
- There is a wide range of understanding, much of which is culturally informed, of the needs of children and of attitudes towards behaviours of children. There is also a spectrum of maltreatment – obvious and hidden, severe and subtle. Consequently, there may not be agreement between individuals, health practitioners, government and other agencies about what constitutes harm, giving rise to different definitions, knowledge and understandings of impact, and therefore different responses.
- Approaches to child protection vary across state and territory jurisdictions within Australia, and this creates inconsistencies in major domains such as legislative frameworks, identification of child maltreatment and service responses.
- Child maltreatment may present as behavioural disturbance, developmental delay and/or other health or learning issues without being recognised as child maltreatment.
- Child protection data only reflect statutory child protection service activity; that is, notifications, investigations, substantiations and formal legal orders including children in out-of-home care (OOHC).

In 2009, in recognition of increasing rates of child maltreatment nationally and the need for a more effective response, the Council of Australian Governments (COAG) committed to the development of the National Framework for Protecting Australia's Children 2009–2020.[12] As well as supporting a national approach, which in itself is a significant commitment, the framework identifies 'shared responsibility' of parents, communities, governments and business, and the need for accurate data to inform policy, service response and outcome measures. Since 2013, the Australian Institute of Health and Welfare (AIHW) has compiled data annually from state and territory jurisdictions as part of the Child Protection National Minimum Data Set (CP NMDS).[13] The total number of cases of substantiated reports of harm, children on statutory orders and children in OOHC has steadily increased over recent years.[14] In Victoria, for example, Aboriginal and Torres Strait Islander children in OOHC increased by 59% between 2013 and 2015.[15] Aboriginal and Torres Strait Islander children are disproportionately represented in child protection and OOHC services, being approximately seven times more likely to be the subject of substantiated reports of harm, as shown in Table 1.[14]

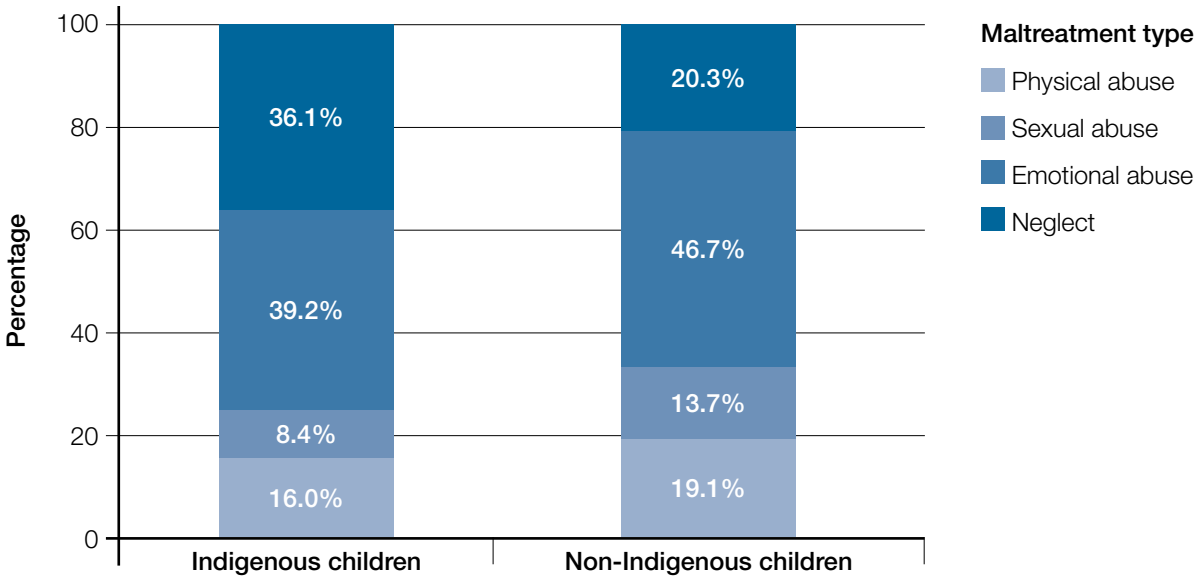
Table 1. Number of children aged 0–17 years who were the subject of substantiated reports of harm or risk of harm, rates per 1000 children by Aboriginal and Torres Strait Islander status 2015–16

State/territory	Indigenous (per 1000 children)	Non-Indigenous (per 1000 children)	All children (per 1000 children)	Rate ratio Indigenous/non-Indigenous
NSW	57.2	7.4	10.1	7.8
Vic	80.2	9.7	10.8	8.3
Qld	21.8	3.3	5.0	6.6
WA	48.3	4.3	7.1	11.3
SA	35.9	2.8	4.6	12.7
Tas	14.5	5.1	7.0	2.8
ACT	45.5	3.5	5.1	13.2
NT	49.6	6.8	24.8	7.3
Total	43.6	6.4	8.5	6.9

Reproduced from Child Family Community Australia. Child protection and Aboriginal and Torres Strait Islander children. CFCA Resource Sheet. Canberra: Australian Institute of Family Studies, 2017. Available at https://aifs.gov.au/cfca/publications/child-protection-and-aboriginal-and-torres-strait-islander-children [Accessed 28 November 2017].

Neglect and emotional abuse are the commonest forms of child maltreatment.[13] A comparison between Aboriginal and Torres Strait Islander and non-Indigenous children with reference to the type of child maltreatment is shown in Figure 1.[14]

Figure 1. Breakdown of primary substantiated maltreatment types in 2015–16, by percentage, Aboriginal and Torres Strait Islander and non-Indigenous children



Reproduced from Child Family Community Australia. Child protection and Aboriginal and Torres Strait Islander children. CFCA Resource Sheet. Canberra: Australian Institute of Family Studies, 2017. Available at https://aifs.gov.au/cfca/publications/child-protection-and-aboriginal-and-torres-strait-islander-children [Accessed 28 November 2017].

There are multiple factors contributing to the high rates of Aboriginal and Torres Strait Islander families represented in these data. Some may relate to the social determinants of family functioning, and others to the interface between Aboriginal and Torres Strait Islander families and child protection systems. In an Australian study that compared Aboriginal and non-Aboriginal children, parental factors that were associated with increased risk of child maltreatment were:

- low socioeconomic status
- parental hospital admissions related to mental health
- substance misuse
- assault.[16]

Aboriginal parents were more likely than non-Aboriginal parents to be subject to all of these factors. In a 2014–16 review of 980 Aboriginal and Torres Strait Islander children and young people in statutory care in Victoria,[15] 87% of children had been exposed to parental alcohol and/or other substance misuse, 88% had experienced significant family violence and almost 60% were affected by parental mental illness. Other major factors included housing instability and homelessness, parental experience of child protection in their own family of origin, and incarceration. In addition, the enquiry found that there were systemic failures in continuity, coordination and quality of healthcare, both primary healthcare and responses to complex health needs.[15]

Interventions

Many English-speaking countries, including Australia, have historically allocated the majority of child protection resources toward a tertiary response; that is, once child maltreatment has occurred. This approach has an emphasis on risk management and relies heavily on legal frameworks that can frequently be adversarial and divisive for families. Other countries respond primarily in ways that support families, are child-focused and aim to prevent harm.[17] Prevention strategies aim to 'reduce the underlying causes and risk factors and to strengthen the protective factors'[18] and require commitment at all levels of government and across service sectors.[12,19]

There is growing recognition of the value of taking a public health approach to reduce both notifications to child protection authorities and statutory orders relating to the care of a child.[17,18,20] The public health approach includes:

- **primary prevention** – making health and education services universally available to all families, supporting families and strengthening parenting capabilities, and implementing public information campaigns
- **secondary prevention** – screening, early detection and providing targeted interventions where risk of harm is identified
- **tertiary prevention** – providing targeted interventions where actual harm is identified.[21]

Comprehensive primary healthcare

Access to comprehensive primary healthcare for all children and families supports better health and wellbeing outcomes.[4,18,22,23] With respect to preventing child maltreatment, the World Health Organization (WHO) specifically identifies the importance of access to medical care, maternal and child health services, mental health services, pregnancy-related advice and care, identification of the risk of child maltreatment (Box 1), and other healthcare as needed.[18] As well as recommending comprehensive primary healthcare for all children and families (universal services), the WHO identifies that interventions in the context of high risk and/or identified harm may be preventive of either further harm to a child and/or maltreatment of other children in a family, thus constituting important secondary and tertiary preventive functions.[18]

In Australia, in the absence of guidelines, national standards for OOHC were developed as a priority of the National Framework for Protecting Australia's Children 2009–2020.[12] These include standards around healthcare and the importance of ongoing primary healthcare for children who have experienced maltreatment.[24] The standards specifically identify the need for:[25]

- a preliminary health check on entry to OOHC
- a comprehensive health and developmental assessment provided by a specialist service
- ongoing monitoring and assessment of health and development.[25]

The key role for GPs at all levels of prevention is to provide comprehensive primary healthcare, to make appropriate referrals and to ensure follow up and continuity of care. Specific attention needs to be paid to children at risk of and/or experiencing harm. These children are more likely to have complex health and development needs and less likely to receive both standard and specialised health services.[7,14]

Prevention through parenting and home visiting programs

The evidence base for primary prevention of child maltreatment is limited and there are few evidence-based guidelines about the primary prevention of child maltreatment. For example, the US Preventive Services Task Force (USPSTF) concludes there is insufficient evidence to make recommendations about interventions in the primary care setting for children who do not have signs and symptoms of maltreatment.[26] The only relevant UK national guideline pertains to identification rather than prevention of child maltreatment.[27]

Few Australian studies have specifically evaluated the effectiveness of interventions in Aboriginal and Torres Strait Islander families and communities. Most of the existing literature is descriptive in nature, particularly documenting inequities and gaps, rather than testing interventions. In addition, there is an emphasis on Aboriginal and Torres Strait Islander child health research in rural and remote settings when in fact just over half of Aboriginal and Torres Strait Islander peoples live in metropolitan and inner regional areas.[28] However, there is some evidence for the prevention of child maltreatment from home visiting programs and parenting programs.[29] Some parenting programs have demonstrated benefit in either **preventing** child maltreatment in at-risk, non-maltreating families or **reducing** the incidence of maltreatment in families where maltreatment has occurred.[30,31] In addition, there are other benefits described from parenting programs (eg Brighter Futures, Invest To Grow, Indigenous Triple P, Tuning in to Kids/Teens, Circle of Security), particularly improvement in parent–child interactions, management of difficult behaviours and parental confidence.[28,32] The indications are that parenting programs may be of greater benefit as universal programs and are less effective for families identified at high risk of maltreatment.[31,32]

In the Australian context, home visiting programs vary between having a health focus, usually led by a nurse (eg Australian Nurse Family Partnership adapted from Nurse Family Partnership, Family Home Visiting), and an early-learning educational focus (eg HIPPY, Parents as Teachers).[28] There are numerous descriptions of locally-adapted service models, particularly in the Aboriginal Community Controlled Health Service sector, that include outreach and home visiting in their design but these have not generally been rigorously evaluated. Other reported outcomes of these programs include greater uptake of healthcare, improved handling of challenging behaviours (HIPPY, Indigenous Triple P), greater knowledge about health and development (HIPPY, Family Home Visiting), and more positive parenting (HIPPY, Nurse Family Partnership, Circle of Security, Tuning in to Kids/Teens).[10,32,33] Outcomes seem to be highly dependent on the duration of the programs, which vary from weeks to years, and specific program content and style, although a lack of rigorous methodology and evaluation makes these factors hard to reproduce.

The following elements have been identified as being the most effective in parenting support and home visiting programs:

- use of cultural consultants in conjunction with professional parent education facilitators and home visitors
- long-term rather than short-term programs (although the literature does not specify the optimal duration)
- a focus on the needs of parents/carers **and** the child
- a supportive approach that focuses on family strengths
- use of structured early intervention program content while also responding flexibly to families.[31]

Culturally informed and trauma-informed services

Strategies for the development of culturally informed services include:[34]

- specific investment in developing relationships between providers and patient/family/community to establish trust and engagement
- service design that combines cultural and community knowledge, values and practice with technical/clinical evidence-based components
- strong presence of Aboriginal and Torres Strait Islander peoples in design and, whenever possible, delivery of services
- family-centered, strengths-based, flexible approaches including outreach and home-visiting models of service design
- services that take into account the complexity of social factors that impact on health and health service access, such as housing, legal issues, employment, income, health literacy and food security.

In addition, it is widely acknowledged that Aboriginal and Torres Strait Islander peoples have experienced multi-layered and complex grief, loss and trauma. These are historical and current, intergenerational, and both collective and personal. What is much less acknowledged, and often poorly understood, is how this may manifest as parental mental health issues, alcohol and other drug use, family violence and general health issues, which can impact profoundly and detrimentally on the capacity to parent effectively and to provide a safe and nurturing environment for children. It is in this context that child maltreatment, most commonly neglect and emotional abuse, may occur.

As a consequence, child maltreatment in general, and the involvement of child protection services in particular, is a highly sensitive issue for Aboriginal and Torres Strait Islander peoples. It cannot be considered separately from the impact and legacy of colonisation, particularly the forced removal of children, often under the guise of 'welfare' concerns, that gave rise to the Stolen Generations.[35]

Given that child maltreatment most commonly occurs in the context of parental trauma, there is a growing awareness of the value of **trauma-informed** care and services.[36,37] The following underlying principles can guide healthcare providers to deliver trauma-informed care:

- acknowledging trauma and its effects on families
- giving attention to ensuring safety and building trust
- adopting collaborative approaches between providers and clients/patients
- making integrated and linked health and social support services available.

Service models that are underpinned by these principles, that are culturally resonant and reflect an understanding of the impact of trauma, are likely to be much more acceptable to and accessed by Aboriginal and Torres Strait Islander peoples.[1,31,38]

Consistent with a strengths-based approach, it is also important to acknowledge the endurance and resilience of Aboriginal and Torres Strait Islander peoples and that most individuals and families are thriving.

Recommendations: Preventing child maltreatment – Supporting families to optimise child safety and wellbeing					
Preventive intervention type	**Target population**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	All pregnant women	Assess risk of child maltreatment by exploring psychosocial risk factors such as alcohol and other drug use, personal history of family abuse and violence (Box 1; and refer to Chapter 16: Family abuse and violence), housing adequacy, engagement with and accessibility of antenatal care, and supportive factors including social and family supports	At first and subsequent antenatal visits (refer to Chapter 2: Antenatal care)	GPP	4, 18
	All children	Conduct routine monitoring of developmental milestones (refer to Chapter 3: Child health, 'Growth failure')	Opportunistic and as part of a routine health assessment	GPP	18, 15
	All families	Assess the risk of child maltreatment and the need for support (Box 1) Offer referral to a culturally informed parenting program where services are available as a universal precaution in the prevention of child maltreatment (refer to 'Resources')	Opportunistic and as part of an annual health assessment	GPP	18, 28 31, 36
	Families identified as being at risk (Box 1)	Conduct a comprehensive psychosocial assessment, including mental health, trauma, alcohol and other drug use (refer to Chapter 4: The health of young people, and Chapter 17: Mental health), and assess for the availability of social supports with an emphasis on building trust and engagement with healthcare (refer to 'Resources')	Opportunistic		4, 11
Behavioural	Children with identified developmental delay, behavioural disturbance, harmful child–parent interactions	Recommend referral to community paediatrician for comprehensive health, behaviour and development assessment Consider referral to other services depending on the specific developmental issue such as mental health, speech (refer to Chapter 3: Child health, 'Growth failure'). Complete GP Management Plan and Team Care Arrangements and/or GP Mental Health Treatment Plan as appropriate to facilitate access to MBS-funded specialist services	Opportunistic	GPP	18
Behavioural	Families identified as being at risk (Box 1)	Offer referral to Aboriginal and Torres Strait Islander–specific support services, including a home visiting program where available Consider offering referral to a culturally informed parenting program if available (refer to 'Resources')	Opportunistic	III–2 GPP	28 15, 28
	Children when there are serious concerns or evidence of maltreatment, including neglect	Notify child protection services as per jurisdictional requirements (refer to 'Resources') Become familiar with health and support services for Aboriginal and Torres Strait Islander peoples in your area, particularly family support services Involve extended family members and/or culturally specific support services whenever possible	Opportunistic	GPP	34, 36, 37
Environmental		Health professionals should consider attending cultural competence training programs and become familiar with principles of trauma-informed practice (refer to 'Resources')		GPP	36

Box 1. Family risk factors for child maltreatment

- Significant parental mental health issues, trauma, and alcohol or other drug issues
- History of family violence
- Parental experience of child protection services
- Homelessness or risk of homelessness
- Parental incarceration
- Social isolation

Resources

- Australian Indigenous HealthInfoNet, Cultural competence training – an extensive list of resources, www.healthinfonet.ecu.edu.au/cultural-ways-home/cultural-ways-workforce/training
- Australian Institute of Family Studies – Australian Government site with extensive resources, including population data, research and reviews relating to children and families, https://aifs.gov.au
- Australian Institute of Family Studies, 'Mandatory reporting of child abuse and neglect', https://aifs.gov.au/cfca/publications/mandatory-reporting-child-abuse-and-neglect
- Australia's National Research Organisation for Women's Safety (ANROWS), *Implementing trauma-informed systems of care in health settings: The WITH study. State of knowledge paper*, http://media.aomx.com/anrows.org.au/s3fs-public/WITH%20Landscapes%20final%20150925.PDF
- Center on the Developing Child, Harvard University – extensive resources regarding the science of early childhood development and its application at individual and societal levels, http://developingchild.harvard.edu

Community directories

- Explore a community directory for social support services in your jurisdiction – an example of a search engine in Townsville, https://webapps.townsville.qld.gov.au/CommunityDirectory/Category/Index/Community%20Directory

Parenting programs

Specific program information is available at the following sites, which may also be searched for local availability:

- Triple P program, www.triplep-parenting.net.au
- Tuning in to Kids, www.tuningintokids.org.au
- Circle of Security International, www.circleofsecurityinternational.com

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Chapter 4: The health of young people

Overview

In this chapter, the terms 'young people' and 'adolescents' refer to people aged 12–24 years. This is consistent with the definitions used by the University of Melbourne Centre for Adolescent Health and the Australian Institute of Health and Welfare.[1,2] It is important to note that this definition differs from the World Health Organization (WHO) recommended age range of 10–19 years, and the United Nations definition (for statistical purposes) of 15–24 years.[3] The preventive health issues for young people are very broad, and many areas relevant to youth health, in particular smoking, physical activity, obesity, alcohol, sexual health, depression and suicide, are addressed in other chapters. Therefore, this chapter focuses on three topics: social emotional wellbeing (previously psychosocial in the second edition of this guide) assessment, the prevention of unplanned pregnancies, and illicit substance use. A new addition to this National Guide is that young people are considered separately in the lifecycle charts (refer to 'National Guide lifecycle chart: Young people').

According to the WHO, 'Promoting healthy behaviours during adolescence, and taking steps to better protect young people from health risks are critical for the prevention of health problems in adulthood, and for countries' future health and ability to develop and thrive'.[4]

Young people's specific developmental and health needs are distinct from those of children and adults. Their sexual and reproductive health, in particular, tend to be different from those of adults.[5] The underlying aetiology of illness in young people is most often psychosocial.[1] Although social and economic factors can influence health in all age groups, the adverse health outcomes for young people are strongly influenced by family breakdown, physical abuse, sexual abuse, neglect and homelessness.

Adolescence is a period of risk taking and experimentation, which is necessary in order to develop resilience. However, this also provides greater potential for adverse health outcomes. According to the US National Academy of Medicine and the National Research Council of the National Academies, young adults have significantly lower rates of healthcare system use compared with other groups, but significantly higher emergency room visit rates compared with those immediately younger and older than them. These lower use rates do not necessarily indicate better health.[6]

There continue to be individual and systems-based barriers to young people using primary care. For example, young people are concerned about confidentiality and privacy, cost of care and medications, and are often embarrassed to discuss sexual matters or access contraception. Health service providers often do not provide youth-friendly spaces including flexible appointments, and are themselves often uncomfortable about discussing health risks with young people. This therefore explains young people's reluctance to seek help for health problems and why they seldom receive counselling about risk-taking behaviours when they do.[7–11] Clinician training and systems-based approaches such as screening tools and templates incorporated into medical charts (charting tools), however, are associated with increases in rates of screening and counselling of adolescents about risky behaviours.[10,12,13]

An overview of the health of Aboriginal and Torres Strait Islander young people

In the 2011 Census, 144,387 people in the age group 12–24 years identified as Aboriginal, Torres Strait Islander or both.[14] They comprise 3.7% of the total Australian population of young people in that age range, and 27% of the total Aboriginal and Torres Strait Islander population. By contrast, young people comprise 18.1% of the total Australian population.[14] Most Aboriginal and Torres Strait Islander young people live in major cities, and inner and outer regional areas; however, they account for 38% of all young people who live in very remote areas in Australia.[2]

In 2007–08, Aboriginal and Torres Strait Islander young people aged 15–24 years were equally likely as all young people to rate their health as 'excellent' (25% and 27% respectively); less likely to rate their health as 'very good' (33% and 40% respectively); and more likely to rate their health as fair or poor (10% and 7% respectively). Overall, 90% of young Aboriginal and Torres Strait Islander people aged 15–24 years rated their health as excellent, very good, or good, compared to 93% of young non-Indigenous people.[2]

The burden of illness in Australian young people is attributable to mental disorders such as anxiety and depression, substance use and injuries.[2] In the years 2003–07, the death rate for Aboriginal and Torres Strait Islander young people was 2.5 times greater than for non-Indigenous young people. The injury death rate was three times higher.[2] The leading causes of death and illness for all Australian youth continue to be accidents and injuries (unintentional and self-inflicted), accounting for around two-thirds of all youth deaths.[2]

Health risk factors such as obesity, physical inactivity, smoking, lower educational attainment, and imprisonment are more prevalent among Aboriginal and Torres Strait Islander youth compared to non-Indigenous youth. In 2014–15, 46.6% of Aboriginal and Torres Strait Islander males and 44.4% of females aged 18–24 years were current smokers, compared with 12.8% and 15.1% respectively for non-Indigenous people aged 18–24 years.[15] Indigenous youth are more likely than non-Indigenous youth to consume alcohol at risky or high-risk levels in the short term (23% versus 15% respectively). In 2008, the incidence of notifiable sexually transmitted infections for Indigenous young people aged 12–24 years was 10.6 times the incidence for non-Indigenous youth.[15] Specifically, chlamydia and gonorrhoea notification rates were 7.1 and an alarming 81.1 times higher respectively.[2]

Aboriginal and Torres Strait Islander youth continue to be less likely to access primary healthcare services and are more likely to present to tertiary healthcare services than non-Indigenous young people. Specific additional barriers that Indigenous young people face include poor health literacy, culturally unresponsive systems, and a sense of 'shame'. The concept of 'shame' extends beyond embarrassment – it includes a sense of self-doubt, lack of belonging, inadequacy and disempowerment. The lack of belonging speaks especially to the collectivist rather than individualistic perspective within the Indigenous culture. In addition, some topics such as sex are taboo among some Aboriginal and Torres Strait Islander groups; this by extension becomes a taboo topic between genders, leading to separate women's and men's business. Primary care services that either are unaware of or do not accommodate these possibilities create additional barriers to access.[16] Therefore, provision of youth-friendly primary care services that are sensitive to the administrative, financial, cultural and psychological hurdles experienced by young people is an integral step in delivering effective preventive interventions.[1,8,11,16–18]

Social emotional wellbeing

Background

The aetiology of most illness in young people is psychosocial, as their 'health and behaviour patterns emerge from a complex interplay between the individual and more "upstream" forces that shape social contexts'.[19] A comprehensive psychosocial assessment that provides information about multiple psychosocial areas of a young person's life is considered essential for the provision of primary healthcare to young people. Although there is limited evidence on the effectiveness of such assessments in improving health outcomes, expert consensus recommends that such assessments be conducted. Numerous US organisations, including the US Preventive Services Task Force and the American Academy of Paediatrics,[17,20,21] have produced guidelines recommending screening of young people for high-risk behaviours.

Interventions

The HEEADSSS (Home, Education/Employment, Eating/Exercise, Activities, Drugs and alcohol, Sexuality, Suicide and depression, Safety) assessment is the most widely recommended psychosocial assessment tool both nationally and internationally.[1,8,17,22,23] It is a systematic, structured and graded approach and designed such that topics perceived to be non-threatening are broached first before moving to more sensitive issues. HEEADSSS has been endorsed by the University of Melbourne Centre for Adolescent Health, the New South Wales Ministry of Health, Queensland Health and The Royal Australian College of General Practitioners.[1,16,24]

In 2012–13, the 'Y Health – Staying Deadly' research project, funded by the Australian Primary Health Care Research Institute, developed a culturally valid and culturally specific version of the HEEADSSS assessment – the Youth Social Emotional Wellbeing (SEW) assessment. Consistent with Aboriginal and Torres Strait Islander holistic perspectives on health, it takes a strengths-based approach. Such an approach focuses on the strengths and capabilities of an individual and the community; advocates for a positive sense of cultural identity; and acknowledges that there is potential for change, growth, and success.[25,26] Appendix 1 provides a table showing

adolescent development stages. Appendix 2 provides the original HEEADSSS assessment questions. Appendix 3a provides the Aboriginal and Torres Strait Islander Youth SEW assessment (modified HEEADSSS), and Appendix 3b provides a question guide to support the latter.

The Youth SEW assessment is recommended to be conducted as part of an annual health check. In Australia, the Medicare health assessment items for Aboriginal and Torres Strait Islander peoples provide an opportunity to conduct funded annual health checks. The 'Y Health – Staying Deadly' project also developed a template for an Aboriginal and Torres Strait Islander Youth Health Check, which can be adapted for use by individual services (refer to 'Resources').[27] The Adolescent Health GP Resource Kit produced by the NSW Centre for the Advancement of Adolescent Health and Transcultural Mental Health Centre also provides templates for a health check for young people.[1]

Recommendations: Social emotional wellbeing

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All young people aged 12–24 years	Conduct a Social Emotional Wellbeing (SEW) assessment using a strengths-based approach, to obtain a holistic assessment of health and to determine risk factors affecting wellbeing Useful tools include a table of adolescent development stages (Appendix 1); the HEEADSSS assessment tool (Appendix 2); and the Aboriginal and Torres Strait Islander Youth SEW assessment (modified HEEADSSS; Appendix 3a) with its question guide (Appendix 3b)	Opportunistic and as part of an annual health check	GPP	1, 8, 17, 20, 23, 28

Note: A strengths-based approach focuses on the strengths and capabilities of an individual and the community; advocates for a positive sense of cultural identity; and acknowledges that there is potential for change, growth and success.

Unplanned pregnancy

Background

Despite improvements in reproductive health outcomes over the last five years, the rates of pregnancy in Australian young women remain high. In 2014, almost 16% of all births in Australia were to young women aged less than 25 years. The fertility rate of teenage Aboriginal and Torres Strait Islander women (57.3 babies per 1000 women) was over four times that of all teenage women (13 babies per 1000). Aboriginal and Torres Strait Islander mothers, compared with non-Indigenous mothers, were over eight times as likely to be teenage mothers (17% compared with 2%).[29,30] Not only are Aboriginal and Torres Strait Islander young women more likely to become pregnant, they are also more likely than their non-Indigenous counterparts to smoke during pregnancy, have fewer antenatal attendances, and be at greater risk of adverse outcomes for themselves and their babies. Young mothers have higher rates of not completing their education, separation from the child's father, and restricted access to financial resources compared with older mothers. Adverse neonatal outcomes include higher rates of preterm birth, small for gestational age, and neonatal death. In 2014, babies born to Aboriginal and Torres Strait Islander mothers were more likely to be admitted to a special care nursery or intensive care unit than babies of non-Indigenous mothers (22% and 15% respectively).[29] Adverse health outcomes in childhood include increased risk of developmental delay, behavioural problems, substance abuse, early sexual activity and becoming teenage parents themselves.[31,32]

There are no recent national data on induced abortions, the last collation being in 2003. Western Australian data from 2012 reveal an induced abortion rate of 29.3 per 1000 women in young women aged 20–24 years, and 14.4 per 1000 in those aged 15–19 years. Young women aged ≤24 years accounted for almost 43% of all abortions. In addition, almost 46% of pregnancies in young women aged 15–19 years and 34% of pregnancies in women aged 20–24 years resulted in induced abortions.[33] This implies that many pregnancies in young women are unplanned events. This is strengthened by evidence from several qualitative studies that there

is a lack of knowledge among young women and young mothers about consequences of sexual activity, contraception methods, and correct contraceptive use. There is also a suggestion that this lack of knowledge is more marked in young women from minority groups or social disadvantage.[11]

According to the 2004–05 National Aboriginal and Torres Strait Islander Household Survey, condoms followed by the Oral Contraceptive Pill (OCP) were the main methods of contraception reported by Aboriginal and Torres Strait Islander women aged 18–24 years (25% and 16% respectively). Both implants and injections had a reported usage of 6%. An estimated 14% of young Aboriginal and Torres Strait Islander women reported not using any contraception.[34]

Interventions

Evidence of effectiveness of preventive interventions

Most of the evidence on effective interventions is derived from US studies. In addition, there is a dearth of evidence on the effectiveness of interventions in socially disadvantaged or minority groups. Consequently, the evidence base is immature and provides mixed evidence in regard to the effectiveness of preventive practice.[11] For example, there is good evidence that the clinic visit can be used to engage the young person in a discussion targeting reproductive health, within the context of broader and more general health issues. Indeed, commencing the consultation with a more general approach rather than with a discussion about sexual health is better suited to the needs of a young person.[1,10,11] The evidence is less clear in regard to more specific interventions. These are discussed in detail in the sections below. The components of routine antenatal health assessments are outlined in Chapter 2: Antenatal care.

Immunisation

Immunisation against vaccine-preventable sexually transmitted infections, such as hepatitis B and human papilloma virus, should be enquired about and offered as appropriate to all youth (refer to Chapter 3: Child Health, 'Immunisation').

Screening and behavioural interventions

Consensus-based recommendations from Australia, US and UK include three interventions for young people: anticipatory guidance/counselling; screening for sexual activity and at-risk sexual behaviour; and appropriate counselling for preventing unplanned pregnancies.[1,11,35–37]

Anticipatory or health guidance is defined as a proactive, developmentally based counselling technique that focuses on a young person's stage of development. It is meant to 'promote a better understanding of their physical growth, psychosocial and psychosexual development, and the importance of becoming actively involved in decisions regarding their health care'.[17,38] There is strong evidence that, interventions such as one-to-one, nurse-led counselling or computer-aided contraception decision-making results in fewer unplanned pregnancies. There is some evidence that one-to-one counselling with young people aged <18 years can increase contraception use.[11,35–37,39]

Parents or guardians should also receive health guidance regarding adolescent development and behaviour.[40–42]

Barrier methods of contraception, especially male condoms, are effective for both pregnancy prevention and reducing risk of some sexually transmitted infections (STIs). While the method-specific failure rate for condoms is 2%, the typical use failure rate is around 15% due to improper and inconsistent use.[11] There is strong evidence that counselling on condom use combined with demonstration of condom use results in increased condom use and engagement with clinical services.[11] Condoms are recommended as a primary prevention intervention with ongoing education to emphasise the importance of consistent and proper use.

Chemoprophylaxis

Hormonal contraception includes the progestin-only and combined oral contraceptive pills (OCP), and long-acting reversible contraception (LARC), which is defined as any method that requires administration less

than once per cycle or month. Examples of hormonal LARCs available in Australia include progestogen-only injections, progestogen-only sub-dermal implants, and progestogen-only intra-uterine devices (IUDs) while copper intrauterine devices are a form of non-hormonal LARC. Unlike the oral contraceptive pill, effectiveness of LARC does not depend on daily compliance. There is some evidence that copper IUDs are more effective than hormonal methods in pregnancy prevention.[43]

There is insufficient evidence to compare the contraceptive efficacy and continuation usage in young people, between the various contraception options mentioned.[44] There is scant but reassuring literature on the use of IUDs in adolescents.[45] Due to the adverse but reversible effect of progestogen-only injections on bone mineral density, this should be used cautiously as first line contraception in young women aged below 18 years.[46] On the other hand, sub-dermal progestogen LARCS are not known to be associated with reduced bone mineral density, and are highly effective.[46,47] On the basis of extrapolated evidence, all other hormonal contraception has the same safety and efficacy profile in young women as in adult women. It is recommended to provide advice on and provide access to all hormonal contraception methods.[11,37]

Hormonal contraception is traditionally commenced with the onset of menses to avoid contraceptive use during an undetected pregnancy. An alternative is immediate initiation if pregnancy can be reliably ruled out. The advantage of this method in young women is to improve the uptake of contraception. However, with the exception of injectable progestogen, there is limited evidence that immediate commencement of contraception reduces unintended pregnancies.[48] There is good evidence that dispensing contraceptives from school-based health centres increases the provision of contraception, but the outcomes in terms of contraceptive use are unknown.[11]

Emergency contraception can decrease the chance of pregnancy. To date however, there is no evidence that either advance provision of or increased access to emergency contraception reduces unintended pregnancies at a population level.[39] On the encouraging side, advance provision has not led to increased rates of STIs, increased frequency of unprotected intercourse, or changes in contraceptive methods. In particular, women who received advance emergency contraception were as likely to use condoms as women who did not receive this. In adolescents, there is strong evidence to support advance provision of emergency contraception as it demonstrates increased use of emergency contraception without adversely impacting on use of other contraception or increasing risky behaviour.[11] In addition, experience with emergency contraception was associated with an increased probability of condom use and an increased perceived capacity to negotiate condom use.[35] The recommendation is therefore to support young women's knowledge of, and access to, emergency contraception.

Environmental

There have been a few reviews of the effectiveness of primary pregnancy prevention programs in young people. Interventions studied have been in both low-income and middle-income countries and high-income countries. They include school-based programs, community-based programs, family planning clinics, workplace programs, use of social media, mass-media programs (including social marketing) and health facility–based programs.[45,49] Overall, most of these programs have a positive impact on knowledge and attitudes.

There is strong evidence that combining educational curriculum interventions with community outreach can be effective in preventing teenage pregnancy and risky sexual behaviour. There is moderate evidence that outreach programs on their own do encourage youth to attend mainstream sexual health services, but their effect on reducing unintended pregnancies is unknown.[11] There is also good evidence that multi-session support and home visiting for disadvantaged, low-income pregnant women or mothers can prevent repeat pregnancies.[37]

There is moderate evidence that a) computer-based interventions can reduce pregnancy and increase use of emergency contraception; and b) a 'virtual world' intervention was effective when associated with a curriculum-based intervention about sexual risk behaviour, in increasing understanding about reproductive health.[11] A clearer picture is therefore emerging of the utility of information technology–based interventions in increasing understanding and reducing risky sexual behaviour. There is also moderate evidence that generic health programs for teenage mothers could be effective in reducing repeat pregnancies.[11]

One systematic review of educational interventions to inform contraceptive choice – theory-based groups as compared to usual care – consistently demonstrated favourable results in terms of reduced pregnancies,

choice of effective contraception and adherence to contraception. These included social cognition models (particularly social cognitive theory), motivational interviewing and the AIDS Risk Reduction Model.[50] Community-based programs tend to be more effective than school-based programs, and clinic-based programs more effective than non–clinic-based programs. Programs in youth-friendly services can improve knowledge, increase contraceptive use and increase use of the service.[11]

There is weak evidence that social marketing campaigns could have a significant effect on the use of contraception or emergency contraception.[11] Abstinence programs were the least successful intervention and are not recommended.[51]

Recommendations: Unplanned pregnancy

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All young people aged 12–24 years	Ask if sexually active, conduct a social emotional wellbeing assessment, and identify at-risk sexual behaviours (eg unprotected sexual intercourse – refer to Chapter 14: Sexual health and blood-borne viruses, Box 1)	Opportunistic and as part of an annual health check	GPP	1, 10, 37
Behavioural	All young people aged 12–24 years	Provide anticipatory guidance[1] and sexual health education (refer to Chapter 14: Sexual health and blood-borne viruses), tailoring the information to the young person's needs Discussion should include the following: • sexual development and sexual feelings • prevention of unplanned pregnancies • resisting sexual and peer pressure • methods of reversible contraception, access to and use of emergency contraception	Opportunistic and as part of an annual health check	GPP	1, 11, 37, 46
	Young people who are considering initiating sexual activity or who are sexually active	Provide contraceptive services		III–2B	11, 37
		Recommend use of and/or provide condoms Discuss the proper methods for condom usage Discuss and offer hormonal contraception Discuss advance emergency contraception	Opportunistic and as part of annual health check	I	11, 37
	Young people engaging in risky sexual behaviour	Use individual behaviour change techniques such as brief interventions (eg information giving, motivational interviewing) and cognitive behavioural therapy	Opportunistic	III–3C	37
		Offer or refer to theory-based pregnancy prevention/education programs to improve knowledge and increase contraceptive use. Examples include social cognitive theory,* motivational interviewing program, AIDS Risk Reduction Model (Box 1)		IA	45, 50, 52, 53
	Parents or guardians of young people	Provide health guidance to parents and other guardians regarding youth sexual health following the principles of anticipatory guidance†	Opportunistic	GPP	40–42

Recommendations: Unplanned pregnancy					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	Young females who are sexually active or considering initiating sexual activity	Assess suitability for, and offer, hormonal contraception. Methods include the oral contraceptive pill (OCP) and long-acting reversible contraception (LARC) (ie progestogen-only injections, progestogen-only subdermal implants, progestogen-only intrauterine devices)	Opportunistic and as part of annual health check	GPP	45, 46
		Offer advance emergency contraception	Opportunistic and as part of annual health check	IA	11
	Young females who have had unprotected intercourse	Conduct a detailed history to assess the context Discuss and recommend emergency contraception as necessary Arrange for appropriate follow-up	Opportunistic	IIB	35
Environmental		Promote youth-friendly primary healthcare services		GPP	1, 16, 54

*Social cognitive theory is a learning theory based on the idea that people learn by watching what others do and will not do.

†Anticipatory guidance is a developmentally based counselling technique that focuses on a young person's stage of development. Counselling is focused toward gaining a better understanding of young people's physical growth, psychosocial and psychosexual development. It emphasises the importance of the young person becoming actively involved in decisions regarding their healthcare.[17]

Box 1. The AIDS Risk Reduction Model[55]

This model has three stages, and is based on several other behaviour change theories, including the Health Belief Model, 'efficacy' theory, emotional influences and interpersonal processes. The three stages outlined below are behaviour labelling, commitment to change and taking action.

Stage	Influences
1. Recognition and labelling of one's behaviour as high risk	• Knowledge of sexual activities associated with human immunodeficiency virus (HIV) transmission • Believing that one is personally susceptible to contracting HIV • Believing that having acquired immune deficiency syndrome (AIDS) is undesirable • Social norms and networking
2. Making a commitment to reduce high-risk sexual contacts and to increase low-risk activities	• Cost and benefits • Enjoyment (eg will the changes affect my enjoyment of sex?) • Response efficacy (eg will the changes successfully reduce my risk of HIV infection?) • Self-efficacy • Knowledge of the health utility and enjoyability of a sexual practice, as well as social factors (group norms and social support), are believed to influence an individual's cost and benefit and self-efficacy beliefs
3. Taking action. This consists of three phases: a) information seeking b) obtaining remedies c) enacting solutions Depending on the individual, phases may occur concurrently or phases may be skipped	• Social networks and problem-solving choices (self-help, informal and formal help) • Prior experiences with problems and solutions • Level of self-esteem • Resource requirements of acquiring help • Ability to communicate verbally with sexual partner • Sexual partner's beliefs and behaviours

Illicit drug use

Background

Illicit drug use includes either use of illegal drugs, or inappropriate use of other substances.[56] Prescription drug abuse is out of scope for this chapter. Alcohol use is covered in Chapter 1. In 2014–15, 28% of Aboriginal and Torres Strait Islander people aged 15–24 years reported that they had used an illicit substance in the previous 12 months. When compared with non-Indigenous youth, Aboriginal and Torres Strait Islander youth are almost twice as likely to be recent users of illicit drugs (28% compared with 16.3%), more likely to engage in risky drug use and poly-drug use, experience greater drug-related harm and are more likely to begin use at a younger age.[30,56] Aboriginal and Torres Strait Islander people living in non-remote areas were more likely than those in remote areas to have used an illicit substance in the previous year (23% compared with 19%) or earlier in their life (24% compared with 17%).

Cannabis is the most common substance used among Aboriginal and Torres Strait Islander and non-Indigenous people who use illicit drugs. Although the rate of cannabis use has remained stable between 2010 and 2013, the overall rate of cannabis use among Aboriginal and Torres Strait Islander peoples is twice that of the non-Indigenous population (19% compared to 10%).[57,58] Additionally, cannabis use in non-urban Aboriginal and Torres Strait Islander peoples has been 'found to be endemic, with over 70% of males and 20% of females being current users'.[59]

There are no accurate data on the prevalence of volatile substance use (VSU) in Aboriginal and Torres Strait Islander communities. Young people aged 14–19 years are more likely than those in other age groups to have used inhalants or volatile substances and are more likely to use it frequently (once or more per month).[60] Seventy-five per cent of inhalant use occurs in a person's own home or at a friend's home.[56] The risk of inhalant use is increased in the presence of social disadvantage and family dysfunction. The use of inhalants by marginalised youth tends to be motivated by the need to relieve boredom and cope with emotional distress.[56,60]

Within remote Aboriginal and Torres Strait Islander communities in Western Australia, Northern Territory, South Australia and Far North Queensland, there has been an overall decline in VSU over the last ten years.[61] However, youth aged 10–24 years form the majority of current users.[61] In some Aboriginal and Torres Strait Islander communities, one study found that young people engaged in VSU as an expression of power (eg through its ability to provoke outrage and to control body weight through suppressing appetite).[62] Aside from the acute hallucinogenic and behavioural derangement problems, the most serious long-term effect of VSU is irreversible neurological damage leading to cognitive impairment. Prenatal exposure is associated with low birthweight, prematurity, developmental delays, neurobehavioural problems and physical malformations.[62] There is also emerging evidence that VSU is associated with periodontal disease and failure to thrive, and increases the risk for subsequent and earlier drug use.[63,64]

The 2013 National Drug Strategy Household Survey data indicate that in the general population, the average age of injecting drug users has risen from 26 to 36 years.[56] A study commissioned by the Aboriginal Drug and Alcohol Council of South Australia, involving an urban Aboriginal population, found no significant differences between those aged >25 years and those aged <25 years in terms of drug use patterns. However, this was not a peer-reviewed study and there is still the problem of injecting drug use and the related harm. The report states that 'the implication of this finding is that those under 25 years may have comparatively poorer outcomes in future years compared to their older counterparts'.[65] Among the general population, sources of needles and syringes for injecting drug users are chemists (64.5%), needle and syringe programs (37.2%), friends (25%) and hospital or doctor (14.9%).[56] Crystal methamphetamine (ice) use is an emerging issue for some remote and regional Aboriginal communities.[66]

Young people most commonly acquire illicit drugs through a friend, acquaintance or relative. Curiosity, peer pressure – including having a sense of identity and belonging – and wanting to do something exciting are the most common reasons for initiating illicit drug use. Reasons for continuing drug use are to enhance experiences, or for the excitement. Reasons for not initiating drug use are not being interested, and concerns about health, addiction and the law.[56,62]

There are social, legal and health-related harms associated with illicit drug use. Poly-drug use is not common among youth in general, but when it occurs is a major risk factor for subsequent drug-related harm.[60,67] Harm is experienced by the individual and others. For example, in 2013, 8.3% of the population had been a victim of an illicit drug-related incident. Verbal abuse was the most frequently reported incident overall, and the proportion experiencing physical abuse by someone under the influence of illicit drugs rose from 2.2% in 2010 to 3.1% in 2013. The 2010 and 2013 National Drug Strategy Household Surveys found that illicit drug users were more likely to be diagnosed or treated for a mental illness and report high or very high levels of psychological distress compared with those who had not used an illicit drug in the previous 12 months.[56] Specifically, there was a further increase in the proportion of recent users with a mental illness between 2010 and 2013.[56] The biggest cause of drug-related hospitalisations was due to mental and behavioural disorders associated with amphetamine use. This hospitalisation rate was more than three times higher for Aboriginal and Torres Strait Islander peoples than non-Indigenous people.[56] In 2010–14, the rate of drug-induced deaths was 1.9 times higher for Aboriginal and Torres Strait Islander peoples living in New South Wales, Queensland, Western Australia, South Australia and the Northern Territory than for non-Indigenous people.[30,56,68] For Aboriginal and Torres Strait Islander young people, there are additional harms since substance dependence further compounds social deprivation, poverty, decreased cultural learning, alienation and the cycle of chronic ill health.[62]

Cannabis use is associated with lower educational attainment, use of other illicit drugs and criminal offending.[59] Regular intoxication may interrupt crucial psychosocial development such as identity formation, interpersonal and occupational skill development. Long-term use in adolescents has been associated with decreased neurocognitive function, such as decreased intelligence quotient scores. Early exposure (before 16 years of age), has been associated with impaired attention, smaller overall brain volume, and reduction in frontal cortex volume leading to increased impulsivity.[59] There have been conflicting views on whether cannabis use leads to mental health disorders. Authoritative experts concur that 'adolescents are more likely to show serious adverse effects, that the age of onset is inversely correlated with those effects and that continuous, heavy usage of cannabis is associated with these effects'.[59,60] Risk factors for cannabis dependency in adolescents are earlier age of initiation and frequency of use. There is almost a five-fold increased risk of developing dependence in those using at least weekly. Compared to adult users, young people have higher rates of binge and opportunistic cannabis use, a shorter duration between first exposure and dependence, and shorter intervals between first and second drug diagnosis.[69]

Risk factors for problematic drug use are highlighted in Box 1. Factors that reduce the risk of illicit drug use include a high degree of family attachment, effective parental communication and supervision, and religious participation.

The resolutions from the 4th National Indigenous Drug and Alcohol Conference in 2016 include the following recommendations to address the problem of illicit drug use among Aboriginal and Torres Strait Islander youth:[65]

- the Australian Government Department of Prime Minister and Cabinet and Department of Health set aside funding for primary prevention activities that is available to organisations as separate core funding
- funding for alternatives to youth detention be made available as a matter of urgency
- specific funding for youth (12–18 years) programs such as youth residential rehabilitation be made available as a matter of urgency
- the Australian Government reinstate funding for education programs, similar to those identified in the previous National School Drug Education Strategy.

Interventions

Evidence of effectiveness of preventive interventions

Australia is an international leader in addressing drug-related problems with the tri-pronged approach of supply reduction, demand reduction and harm reduction/minimisation. This section focuses on primary and secondary prevention interventions in the domains of demand reduction and harm minimisation. Supply reduction strategies are generally beyond the scope of primary healthcare services and are therefore not addressed here.

Immunisation

Immunisation against hepatitis B is a harm minimisation strategy to protect against the consequences of injecting drug use with contaminated needles (refer to Chapter 14: Sexual health and blood-borne viruses).[70]

Screening

Screening can be performed to assess individuals at risk of illicit drug use or to identify use. Illicit drug use is initiated and maintained by a complex array of biological, cognitive, psychological and sociocultural processes. Hence all of these domains should be assessed. Adolescent self-reporting of cannabis use is generally reliable, but reporting of other illicit drugs may be less reliable.[69] Assessment should therefore be performed in a non-judgemental manner. In addition, illicit drug use questions are less threatening when asked in the context of a general health interview. This is best done via a comprehensive social emotional wellbeing (SEW) assessment.[1,27,69] Such assessments can either be done in a routine manner[17] or opportunistically in young people presenting with respiratory disorders and mental health problems, which are common presentations among cannabis users.[69]

The following specific screening tools have been developed to identify substance use.

The **CRAFFT** screening tool is a behavioural health screening tool for use with children and young people under the age of 21 years.[71] It is recommended by the American Academy of Pediatrics' Committee on Substance Abuse for use with adolescents. It consists of a series of six questions developed to screen adolescents for high-risk alcohol and other drug use disorders simultaneously. It is a short, effective screening tool meant to assess whether a longer conversation about the context of use, frequency, and other risks and consequences of alcohol and other drug use is warranted. The tool can be self-administered or administered by a clinician. It has been translated into six languages (refer to 'Resources' for links to the English versions).

The **Indigenous Risk Impact Screen (IRIS)** and brief intervention is a 13-item, two-factor screen that assesses alcohol and other drug use and associated mental health issues. It has been validated for use with Aboriginal and Torres Strait Islander people aged ≥18 years and is included in the Department of Health and Ageing *Alcohol treatment guidelines for Indigenous Australians.*[72] Training is a necessary prerequisite to use of the IRIS tool and is currently being provided through Queensland Health.

The **Substances and Choices Scale** is a tool developed in New Zealand and validated for use in people aged 13–18 years.[71,73] It can also be used for repeat measures to assess change over time.

Behavioural

The majority of problematic illicit drug use occurs in young people with high levels of risk factors (Box 1). Programs to prevent initiation of illicit drug use should commence with younger children.[60,67] There is evidence supporting the implementation of drug education, especially if based on social learning theories. Although there is limited evidence, preventive case management tailored to a young person's developmental needs is an appealing approach for those with multiple risk factors for illicit drug use.[60] Important aspects of this approach are to assess needs, identify relevant services, coordinate service delivery and monitor outcomes. It requires complex coordination across a range of service types.[60] Examples include the Multisystemic Therapy (MST) and Children at Risk (CAR) programs in the US. Key elements of these programs include developing service delivery objectives in consultation with the young person and their family; collaboration between various services (eg community health, juvenile justice, drug abuse, education); and ongoing monitoring of progress. They typically require intensive case management, coordinating family intervention, after-school activity, mentoring, tutoring, individual psychiatric assessment and counselling.

Brief interventions, such as those that form part of the culturally validated IRIS program, are cautiously supported and recommended, as there is limited evidence that motivational interviewing reduces substance use.[74,75] There is no evidence currently, to support brief school-based interventions.[76]

Environmental

The legacy of colonisation and public health interventions involving forcible isolation, incarceration, and punitive measures needs to be taken into account in addressing illicit drug use. Improved access to youth-

friendly primary care services is important and has been recommended by the National Indigenous Drug and Alcohol Committee. Youth workers also have potential to positively impact on Aboriginal and Torres Strait Islander young people's resilience, although this strategy has not been formally evaluated.[77]

Community support and engagement is particularly important for illicit drug use programs, because of multifactorial risks and the need for multidisciplinary resources. Such factors are especially critical in addressing inhalant use, in particular petrol sniffing.[78] Strategies that are devised without community input run the risk of being rejected.[79] Successful community engagement strategies include mentorship, encouraging school completion, encouraging a positive school ethos, and youth sport and recreation programs.[80–82] Mentorship is aimed at developing positive social relationships between young people and adults in order to support healthy role modelling. This is a promising approach and warrants further research.[60] Parenting programs and other family-based interventions aimed at encouraging healthy family development and reducing parent–adolescent conflict show promise but also need further research.[83–85] Youth worker brokerage programs in Central Australia are currently being evaluated.[86]

Successful school-based drug education programs are those based on social learning theory and that take into account causes of drug use and adolescent developmental pathways. The Life Skills Training program, peer education, and youth sport/recreation programs are recommended approaches that warrant further research.[60]

There is good evidence to support needle and syringe exchange programs and supervised injection centres[87–91] (refer to Chapter 14: Sexual health and blood-borne viruses).

Recommendations: Illicit drug use

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Immunisation	All young people (aged 12–24 years)	Review hepatitis B immunisation and immune status and offer vaccination where indicated (refer to Chapter 14: Sexual health and blood-borne viruses)	As per Australian standard vaccination schedule	GPP	70
Screening	All young people	Assess for presence of risk factors for illicit drug use (Box 1)	As part of annual health check	GPP	1, 8, 92, 93
	Young people with risk factors for drug use (Box 1)	Administer one of the following questionnaires to ascertain drug use: • CRAFFT screening tool (age ≤21 years) • Indigenous Risk Impact Screen (IRIS) tool (age ≥18 years) • Substances and Choices Scale (age 13–18 years) (Refer to 'Resources')	Opportunistic and as follow-up of annual health check	IIIB	1, 8, 71–73, 92
		Test for blood-borne viruses and sexually transmitted infection (STI) (refer to Chapter 14: Sexual health and blood-borne viruses)		GPP	94
Behavioural	Young people with multiple risk factors for drug use (Box 1)	Refer for preventive case management where services are available*	Opportunistic	IB	60
	Young people who are using illicit drugs	Provide brief interventions (eg in conjunction with administration of one of the above screening questionnaires) (refer also to Chapter 1: Lifestyle, 'Introduction', 5As framework)	Opportunistic	IIIB	72, 95
		Refer to drug education programs based on social learning theories (eg Life Skills Training program, peer education, youth sport and recreation programs)	Opportunistic	IIB	60, 78, 79

Recommendations: Illicit drug use					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	Families of young people who are using illicit drugs	Consider referral where appropriate to parent education programs and family intervention therapy to encourage healthy family development and reduction of parent–adolescent conflict	Opportunistic	IIB	83–85
	Young people who are using injecting drugs	Refer to needle and syringe exchange programs where appropriate	Opportunistic	IB	87
Environmental		Promote school completion		GPP	80, 81, 96
		Promote access to community and school-based drug education programs (based on social learning theories)		IB	60, 97
		Promote youth-friendly primary healthcare services		GPP	1, 60, 77, 98
		Support increased access to youth workers Support community-driven illicit drug use prevention programs (especially valuable for inhalant abuse)		IIB	78
		Support and promote community engagement strategies such as mentorship		IB	60
		Support supervised injecting centres		IIB	88–91

*Preventive case management involves the coordinated delivery of intensive services tailored to meet a range of developmental needs. It requires intensive case management through coordinating family intervention, after-school activity, mentoring, tutoring, individual psychiatric assessment and counselling. The approach therefore requires complex coordination across a range of service types such as health, juvenile justice, education and substance abuse. Key aspects are to assess needs, identify relevant services, coordinate service delivery and monitor outcomes. The young person (and if possible, the family) should be involved in developing the service delivery objectives.[60] This can be similar to developing a care plan for people with chronic conditions.

Box 1. Risk factors for illicit drug use[56,60,61]

Individual influences

- Not completing secondary school
- Unemployment
- Delinquency
- Residing in remote and very remote areas
- Favourable attitudes to drug use
- Sensation seeking and adventurous personality
- Relationships with peers involved in drug use
- Low involvement in activities with adults

Family influences

- Parental conflict
- Parent–adolescent conflict
- Parental attitudes to drug use and rules around drug use
- Alcohol and drug problems in the family

Environmental influences

- Perceived and actual level of community drug use
- Community disadvantage and disorganisation
- Availability of illicit substances within the community
- Positive media portrayal of drug use
- Decreased presence of law enforcement

Resources

- Australian National University, SA Health, 'Y health – Staying deadly' – with sample template for an Aboriginal and Torres Strait Islander Youth Health Check, http://files.aphcri.anu.edu.au/reports/Final%20report_Y%20Health%20Staying%20Deadly.pdf
- Center for Adolescent Substance Abuse Research, CRAFFT screening tool (for clinicians), www.ceasar-boston.org/CRAFFT/index.php
- Center for Adolescent Substance Abuse Research, Self-administered CRAFFT, www.ceasar-boston.org/CRAFFT/selfCRAFFT.php
- Indigenous Risk Impact Screen (IRIS) tool and brief intervention – tool made available only after participation in a training workshop; more information, http://insightqld.org/indigenous
- Substances and Choices Scale Manual, http://optforwellbeing.org/sites/default/files/sacs/SACSusermanual2010.pdf
- Substances and Choices Scale Questionnaires, http://optforwellbeing.org/professionals/publications-and-resources/substances-and-choices-scale-sacs

Appendix 1. Stages of adolescent development[1]

	Early (10–13 years)	Middle (14–17 years)	Late (18–21 years)
Central question	'Am I normal?'	'Who am I?' 'Where do I belong?'	'Where am I going?'
Major developmental issues	• Coming to terms with puberty • Struggle for autonomy commences • Same-sex peer relationships all important • Mood swings	• New intellectual powers • New sexual drives • Experimentation and risk taking • Relationships have self-centred quality • Need for peer group acceptance • Emergence of sexual identity	• Independence from parents • Realistic body image • Acceptance of sexual identity • Clear educational and vocational goals, own value system • Developing mutually caring and responsible relationships
Main concerns	• Anxieties about body shape and changes • Comparison with peers	• Tensions between family and adolescent over independence • Balancing demands of family and peers • Prone to fad behaviour and risk taking • Strong need for privacy • Maintaining ethnic identity while striving to fit in with dominant culture	• Self-responsibility • Achieving economic independence • Deciding on career/vocation options • Developing intimate relationships
Cognitive development	• Still fairly concrete thinkers • Less able to understand subtlety • Daydreaming common • Difficulty identifying how their immediate behaviour impacts on the future	• Able to think more rationally • Concerned about individual freedom and rights • Able to accept more responsibility for consequences of own behaviour • Begins to take on greater responsibility within family as part of cultural identity	• Longer attention span • Ability to think more abstractly • More able to synthesise information and apply it to themselves • Able to think into the future and anticipate consequences of their actions

Reproduced from Chown P, Kang M, Sanci L, Newnham V, Bennett DL. Adolescent health GP resource kit: Enhancing the skills of general practitioners in caring for young people from culturally diverse backgrounds. 2nd edn. Westmead, NSW: NSW Centre for the Advancement of Adolescent Health and Transcultural Mental Health Centre, 2008. Available at www.health.nsw.gov.au/kidsfamilies/youth/Pages/gp-resource-kit.aspx [Accessed 20 November 2017].

Appendix 2. HEEADSSS assessment[28,99]	
Assessment area	**Questions**
H – Home	**Explore home situation, family life, relationships and stability** Where do you live? Who lives at home with you? Who is in your family (parents, siblings, extended family)? What is your/your family's cultural background? What language is spoken at home? Does the family have friends from outside its own cultural group/from the same cultural group? Do you have your own room? Have there been any recent changes in your family/home recently (moves, departures, etc)? How do you get along with your mum and dad and other members of your family? Are there any fights at home? If so, what do you and/or your family argue about the most? Who are you closest to in your family? Who could you go to if you needed help with a problem?
E – Education/ employment	**Explore sense of belonging at school/work and relationships with teachers/peers/workmates, changes in performance** What do you like/not like about school/work? What are you good at/not good at? How do you get along with teachers/other students/workmates? How do you usually perform in different subjects? What problems do you experience at school/work? Some young people experience bullying at school, have you ever had to put up with this? What are your goals for future education/employment? Any recent changes in education/employment?
E – Eating/ exercise	**Explore how they look after themselves, eating and sleeping patterns** What do you usually eat for breakfast/lunch/dinner? Sometimes when people are stressed they can overeat, or under-eat. Do you ever find yourself doing either of these? Have there been any recent changes in your weight? In your dietary habits? What do you like/not like about your body? *If screening more specifically for eating disorders, you may ask about body image, the use of laxatives, diuretics, vomiting, excessive exercise, and rigid dietary restrictions to control weight.* What do you do for exercise? How much exercise do you get in an average day/week?
A – Activities/peer relationships	**Explore their social and interpersonal relationships, risk-taking behaviour, as well as their attitudes about themselves** What sort of things do you do in your free time out of school/work? What do you like to do for fun? Who are your main friends (at school/out of school)? Do you have friends from outside your own cultural group/from the same cultural group? How do you get on with others your own age? How do you think your friends would describe you? What are some of the things you like about yourself? What sort of things do you like to do with your friends? How much television do you watch each night? What's your favourite music? Are you involved in sports/hobbies/clubs/other activities?

Appendix 2. HEEADSSS assessment[28,99]	
Assessment area	**Questions**
D – Drug use/ cigarettes/ alcohol	**Explore the context of substance use (if any) and risk-taking behaviours** Many young people at your age are starting to experiment with cigarettes/drugs/alcohol. Have any of your friends tried these or other drugs such as marijuana, injecting drugs, other substances? How about you, have you tried any? *If 'Yes', explore further.* How much do you use and how often? How do you (and your friends) take/use them? Explore safe/unsafe use, binge drinking and so on. What effects do drug taking/smoking/alcohol have on you? Has your use increased recently? What sort of things do you (and your friends) do when you take drugs/drink? How do you pay for the drugs/alcohol? Have you had any problems as a result of your alcohol/drug use (with police, school, family, friends)? Do other family members take drugs/drink?
S – Sexuality	**Explore their knowledge, understanding, experience, sexual orientation and sexual practices – look for risk-taking behaviour/abuse** Many young people your age become interested in romance and sometimes sexual relationships. Have you been in any romantic relationships or been dating anyone? Have you ever had a sexual relationship with a boy or a girl (or both)? *If 'Yes', explore further.* [If sexually active] What do you use to protect yourself (condoms, contraception)? What do you know about contraception and protection against STIs? How do you feel about relationships in general or about your own sexuality? [For older adolescents] Do you identify yourself as being heterosexual or gay, lesbian, bisexual, transgender or questioning? Have you ever felt pressured or uncomfortable about having sex?
S – Suicide/ self harm/ depression/ mood	**Explore risk of mental health problems, strategies for coping and available support** Sometimes when people feel really down they feel like hurting themselves, or even killing themselves. Have you ever felt that way? Have you ever deliberately harmed or injured yourself (cutting, burning or putting yourself in unsafe situations – eg unsafe sex)? What prevented you from going ahead with it? How did you try to harm/kill yourself? What happened to you after this? What do you do if you are feeling sad, angry or hurt? Do you feel sad or down more than usual? How long have you felt that way? Have you lost interest in things you usually like? How do you feel in yourself at the moment on a scale of 1 to 10? Who can you talk to when you're feeling down? How often do you feel this way? How well do you usually sleep? It's normal to feel anxious in certain situations. Do you ever feel very anxious, nervous or stressed (eg in social situations)? Have you ever felt really anxious all of a sudden? For a particular reason? Do you worry about your body or your weight? Do you do things to try and manage your weight (eg dieting)? Sometimes, especially when feeling really stressed, people can hear or see things that others don't seem to hear or see. Has this ever happened to you? Have you ever found yourself feeling really high energy or racy, or feeling like you can take on the whole world?
S – Safety **S – Spirituality**	**Explore sunscreen protection, immunisation, bullying, abuse, traumatic experiences, risky behaviours; and beliefs, religion** What helps you relax, escape? What gives you a sense of meaning?

Appendix 3a. Aboriginal and Torres Strait Islander Youth Social Emotional Wellbeing (SEW) assessment[27]		
Original HEEADSSS 'domain' and description	Social emotional wellbeing topic and description	Comments
	General We want to find out about the young person's background, beliefs, experiences and connection to culture. We also want to hear about their hopes or plans for the future. This is an important part of the assessment and may overlap with the other areas	**Non-Indigenous health professionals must not engage in the cultural aspects of this discussion unless they have good local Aboriginal and/or Torres Strait Islander knowledge and connections and excellent rapport with the young person**
Home Explore the home situation, family life, relationships and stability	**Home** We want to find out about where the young person is living and with whom; family life, relationships and stability We want to know if the young person feels safe in their environment We also want to identify any overcrowding that is causing problems	There are social and wellbeing benefits to living with a supportive network of people. Therefore, it is important to ask about overcrowding that is causing problems, rather than assuming that it is a problem by definition
Education/employment Explore sense of belonging at school/work and relationships with teachers/ peers/workmates, changes in performance	**Learning/work** We want to find out about: • How the young person is going at school and/or work • Relationships with teachers/peers/workmates • Whether there have been big changes in how they are going at school or work • Whether they feel safe at school/work • Whether they have any plans for when they finish school or for their career	
Eating/exercise Explore how they look after themselves, eating and sleeping patterns	**Eating/exercise** We want to find out about: • Food and eating habits, whether they eat bush tucker, whether they are getting enough to eat • Who does the food shopping and cooking • What kind of exercise they get during a week, how often and how much. This can include playing sports, going to a gym, walking to the shops or bus stop, walking/riding a bicycle to school or work • Whether there has been any recent change in weight and if this is something the young person had planned or not	Food insecurity is recognised as a determinant of poor health in the Aboriginal and Torres Strait Islander population[100,101] The One21seventy child health audit includes evidence of concern regarding food security[102]
Activities/peer relationships Explore their social and interpersonal relationships, risk-taking behaviour, as well as their attitudes about themselves	**Hobbies, interests and friendships** We want to find out about: • How the young person gets along with other young people • How they are socialising • What kind of interests they have • Whether they do things safely (eg wears a bicycle helmet, puts on a seat belt, uses sunscreen and wears sunglasses) • Whether they are taking part in any high-risk behaviours, including gambling	If there are risk-taking behaviours/ activities, we need to: • Check whether the young person has broken the law or been involved with the juvenile justice system • Refer for youth-specific counselling If the young person seems to be socially isolated, we need to conduct a mental health assessment

Appendix 3a. Aboriginal and Torres Strait Islander Youth Social Emotional Wellbeing (SEW) assessment[27]		
Original HEEADSSS 'domain' and description	**Social emotional wellbeing topic and description**	**Comments**
Drug use/cigarettes/ alcohol Explore the context of substance use (if any) and risk-taking behaviours	**Substance use, including cigarettes, alcohol and other drugs** We want to find out if the young person is smoking, drinking alcohol or using other drugs If so, we want to find out about: • Whether they are being pressured into it • What they are using, how and when they use, how much they are smoking/drinking/using, how often, if there have been any problems • If the people they spend time with smoke, drink or use substances	
Suicide/self-arm/ depression/mood Explore risk of mental health problems, strategies for coping and available support	**Mental health** We want to find out about the young person's mood, whether there is ongoing stress in their life, whether there has been anything hurtful or traumatic happen to them recently or in the past If the young person has a mood problem, you must assess if they are at risk of self-harm or suicide	
Sexuality Explore their knowledge, understanding, experience, sexual orientation and sexual practices. Look for risk-taking behaviour/abuse	**Sexual health and sexuality** We want to discuss the young person's sexual health, whether they have had or are having sex, what their sexual orientation is and how they feel about themselves If the young person has had or is having sex, we want to know if: • They are using any kind of protection or contraception • They are consenting to it or being pressured	
Safety and spirituality Explore sunscreen protection, immunisation, bullying, abuse, traumatic experiences, risky behaviours Explore beliefs, religion: • What helps them relax, escape? • What gives them a sense of meaning?	Immunisation status is usually checked as part of ongoing clinical care. Ask about it only if it is not already known	Safety issues have been considered across all areas and not as a separate topic Spirituality has been considered as part of cultural connectedness
	Finishing off We complete this assessment by checking with the young person if there is anything else they wish to talk about	

Appendix 3b: Aboriginal and Torres Strait Islander Youth Social Emotional Wellbeing (SEW) assessment: Question guide[27]	
Topic area	**Possible questions**
General Explore background, beliefs, experiences and connection to culture	• Can you tell me about yourself? • Where's country for you? Where are you from? Where is your family from? • Do you visit country or your family's country? • Do you like where you are from? • Do you feel connected with your culture? How close do you feel to your culture? • Do you feel connected with your community? How close do you feel to your community? • Do you take part in any cultural and/or community activities (eg NAIDOC events, ceremonies, hunting, art and crafts)? If so, how often? • Do you speak any Aboriginal and/or Torres Strait Islander languages? • Do you have any beliefs that are important to you (religious or spiritual)? • Have you been through ceremony? **[Do not ask this question unless you have good local Aboriginal and/or Torres Strait Islander knowledge and connections and excellent rapport with the young person]** • What do you hope for in your life? • Have you faced, or do you face, prejudice or racism? [If 'Yes', explore details]
Home Explore the home situation, family life, relationships and stability. We also want to identify any overcrowding that is causing problems	• Can you tell me about where you live? • Where do you live? (What type of place, how many rooms, is this where you live all the time? Is there any chance you will need to move?) • Do you stay at more than one place? [If 'Yes'] What is it like for you moving around? • Do you have your own room? • Can you tell me about your family/the people you are living with? • How many people live with you at the moment? • How are things going at home or where you live? • Who are you closest to in your family? • Do you get along with your family? Do your family members get along with each other? • Do you have any worries about your family or friends? • Do you have children? (What age?) • Do you feel safe at home or where you are staying? • Are there ever times you feel like leaving home? • Have there been any changes at home lately (moves, departures, travelling to and from home/community etc)?
Learning/work Explore how the young person is going at school/work and relationships with teachers/peers/ workmates; whether there have been significant changes	• Do you go to school/study or work? • What year are you in/what job do you do? • How are you going at school/work? Or Are you happy at school/work? [Explore] If not, why? • Have you been missing or not going to school/work, or often turning up late? • Are you keeping up with your schoolwork? Do you need any help? How are your grades? Or What are your school reports like? • Do you get along with your teachers/boss and other students/workmates? [Explore] • How are your friends or other students or workmates treating you? Or Do you have any problems at school/work, like getting bullied? • Do you feel safe at school/work? • Does your family encourage or help you with your studies/sport/work? • What would you like to do when you leave school/you're older? Or What job/career plans do you have?

Appendix 3b: Aboriginal and Torres Strait Islander Youth Social Emotional Wellbeing (SEW) assessment: Question guide[27]	
Topic area	**Possible questions**
Eating/Exercise Explore food and eating habits and physical activity	• What do you usually eat and drink over a whole day? Or Tell me what you ate yesterday? [Explore type of food and amount, bush tucker] • What do you like to eat? • Do you get enough to eat? • Who shops for the food/groceries? Who does the cooking? • Has your weight or diet changed lately? • How do you feel about the way you look? [Explore the possibility of eating disorders] • During a usual or typical week, what kind of exercise do you do? • Do you play sport or do any exercise? [Explore what kind, including traditional dance, how often and for how long] • Do you ride your bike or walk to get around? [Explore informal physical activity]
Hobbies, interests and friendships Explore relationships with other young people, how they are socialising, whether they are engaging in any high-risk behaviours	• Who do you hang around with? (Brothers, sisters, cousins, aunties, uncles or friends from school?) [Explore for social isolation] • Do you like your friends, and how much time do you spend hanging out with them? • Have you ever been pressured into anything by your peers? • What do you (and your friends) do in your free/spare time? What do you do on the weekend? • Do you wear bike helmets, seatbelts? Do you use sunglasses and sunscreen? • Do you do anything that gets you into trouble, or could get you into trouble? Have you ever been in trouble with the police? • Do you play the pokies, cards or bet online? [If 'Yes'] How do you pay for it? Or What do you spend your money on?
Substance use, including cigarettes Explore use, type, amount, frequency, consequences. Explore if the people they spend time with smoke, drink or use substances	• Do people around you smoke or drink? • Do you smoke or drink? How much and how often? • What about drugs? • Are people around you doing drugs? What type and how often? • Have you tried drugs before? [If 'Yes'] Are you still taking them? What type and how often? • [If currently using] Does this affect relationships, school, work or other responsibilities? How are you paying for it? Has this ever got you into trouble (getting into fights or in trouble with the police)? • Are you, or have you been, pressured into it?
Mental health Explore mood, stress, and trauma. Assess suicide risk if there are mood problems	• How have you been feeling lately? • Have you been feeling sad, stressed, nervous or worried? [This question is not necessary if the young person has filled out a mental health tool such as the Kessler Psychological Distress Scale (K-10) or K-5 questionnaire.][103] • Are you still enjoying things as much as usual? • How have you been sleeping? How much sleep do you get each night? • Has your eating been OK? • Has anything traumatic or hurtful happened to you lately or in the past? • Do you have thoughts about hurting yourself? Have you ever tried to hurt yourself? [If 'Yes', explore how serious the injury was] • Have you had any thoughts about suicide? [If 'Yes'] Have you tried to end your own life? [Try to find out if this is a current problem] **[Do not ask this question routinely. Ask this only if the young person has risk factors for suicide.*]**

Appendix 3b: Aboriginal and Torres Strait Islander Youth Social Emotional Wellbeing (SEW) assessment: Question guide[27]	
Topic area	**Possible questions**
Sexual health and sexuality	• [If the young person appears not to have not gone through puberty] Have you noticed any body changes? • [For females] Are you having periods? Is everything going OK with your monthly or period? • Do you have a boyfriend or girlfriend? • Have you ever slept with them or had sexual intercourse? How about with other people (boys/girls or males/females)? • What do you use for protection? • [For females] Do you take anything to stop you from getting pregnant (eg pill or Implanon)? • Are you attracted to boys/males or girls/females, or are you unsure? Do you feel comfortable with your sexuality or feelings? • Has anyone ever taken advantage of you or used you? Have you ever felt uncomfortable or pressured about having sexual intercourse?
Finishing off	• Do you have any other concerns? Or Is there anything else you want to talk about? Or Is there anything else that is worrying you that we have not talked about?
*Risk factors for suicide: past history of intentional self-harm; history of mood or mental health problems; hazardous alcohol consumption or use of other recreational drugs.	

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Chapter 5: The health of older people

Aboriginal and Torres Strait Islander communities have different age structures to the non-Indigenous population, due to high fertility and increased mortality at all ages, giving a much lower median age (21.8 years versus 37.6 years).[1] The aged population is therefore smaller as a proportion, with 8.8% of Aboriginal and Torres Strait Islander people being over 55 years of age and only 3.3% over 65 years of age. The corresponding figures for non-Indigenous Australians are 22% and 13% respectively.[2] In 2006 this amounted to 60,000 Aboriginal and Torres Strait Islander people over 50 years of age, contrasting with almost 6.2 million non-Indigenous people in the same age group.[3] Of the total Australian population aged 75 years and older, only 0.4% (5000 people) identify as an Aboriginal and/or Torres Strait Islander person.[3] However, demographic shifts are occurring, and the number of Aboriginal and Torres Strait Islander people over 55 years of age is projected to double between 2011 and 2026.[2] The care of older people is becoming more important as the population ages. In addition, many of the disorders that affect older people occur at younger ages for Aboriginal and Torres Strait Islander people.

Many areas of preventive care for older people are covered in other chapters of this guide; in particular, vision (Chapter 6: Eye health), hearing (Chapter 7: Hearing loss), respiratory disease (Chapter 9: Respiratory health) and cardiovascular health (Chapter 11: Cardiovascular disease prevention). This chapter will cover three important issues relating to older people not covered elsewhere in this guide: osteoporosis, falls and dementia.

Osteoporosis

Background

Osteoporosis is defined as a condition in which there is low bone mass and deterioration of the microarchitecture of the bones, causing bone fragility and an increased risk of fracture. It can be diagnosed on the basis of a fragility fracture (a fracture from trauma equivalent to a fall from normal standing height or less) or by a bone mineral density (BMD) test, dual-energy X-ray absorptiometry (DXA), which measures BMD at the hip and spine. BMD is expressed as a T-score, defined by the World Health Organization (WHO) as a measure of standard deviation from the reference values of bone density for a 30-year-old of the same sex.[4] A T-score of –2.5 or lower is diagnostic of osteoporosis, and a T-score between –1.0 and –2.5 is diagnostic of osteopenia. However, as noted above, a low T-score is **not** required for the diagnosis in a person who has a history of fragility fracture.[5]

Osteoporosis is common in the general population, with 43% of women and 13% of men over 70 years of age meeting the WHO criteria for osteoporosis.[6] The residual lifetime risk of a minimal trauma fracture in non-Indigenous Australians is approximately 44% for women over 60 years of age and 25% for men over 60 years of age.[7] These fractures often occur at sites other than the classic osteoporotic sites of wrist, hip and vertebra. However, hip fractures are important because they are associated with significant mortality and loss of independence. Vertebral fractures are associated with significant long-term disability related to pain and kyphosis.[8]

Recent reports suggest that Aboriginal and Torres Strait Islander peoples are at higher risk for osteoporotic hip fractures, and that these fractures occur at younger ages. A report based on national hospital separations data from 2005 to 2007 demonstrated that the rate of hip fracture for Aboriginal and Torres Strait Islander males was twice as high as the rate for non-Indigenous males, and for Aboriginal and Torres Strait Islander females was 26% higher than for non-Indigenous females.[9] The average age at time of hip fracture was younger: an average of 65 years for Aboriginal and Torres Strait Islander men (compared with 81 years for non-Indigenous men), and 74 years for Aboriginal and Torres Strait Islander women (compared with 83 years for non-Indigenous women).[9]

This increased rate was corroborated by a study looking at hospital data in Western Australia between 1999 and 2009. It confirmed a higher rate of hip fracture due to minimal trauma in both Aboriginal men and women, with Aboriginal men having more than twice the age-standardised risk of fracture compared with non-Indigenous men.[10] This was especially so in younger age groups, with no apparent differences in risk for people over 80 years of age. The rate of minimal trauma hip fracture in Aboriginal peoples increased on average by 7.2% per year over the ten years of the study, whereas the rate of fracture in non-Aboriginal people decreased by an average of 3.4% per year.[10]

However, there are limited data on whether this apparent increased risk of fracture is correlated with differences in BMD or DXA scanning. A body composition study of young, healthy Aboriginal and Torres Strait Islander volunteers demonstrated higher femoral neck bone mineral densities than for a Caucasian group, although there was no difference in lumbar spine bone mineral density.[11]

There is a significant treatment gap with osteoporosis, with only 30% of those at highest risk for fracture (those with a previous fragility fracture) taking specific osteoporosis treatments.[12] In addition, the use of DXA scans varies within the population, with DXA use in urban areas three times higher than in rural and remote locations,[13] which is important given a high proportion of Aboriginal and Torres Strait Islander peoples live outside major cities. Also, despite the fact that in the general population the female:male ratio of osteoporotic fractures is 2:1, the rate of DXA use is 4:1, suggesting that men are being under-tested.[13]

A number of factors increase the risk of osteoporotic fractures. In the general population women have approximately double the lifetime risk of men; however, as discussed above, this may not be true in Aboriginal and Torres Strait Islander populations. Fracture incidence increases exponentially with age in both men and women, approximately doubling with each decade.[14,15] A previous fracture doubles the risk of subsequent fracture, and a previous vertebral fracture carries around a five-fold increased risk of a further vertebral fracture.[16,17] Low bone density as measured by DXA approximately doubles the fracture risk for each unit of standard deviation from the mean (each –1.0 of T-score).[18] A history of falls at least doubles the risk of an osteoporotic fracture compared to those with no such history.[19]

A family history of fragility fractures after age 50, kyphosis or diagnosed osteoporosis in a father, mother or sister increases the risk of osteoporotic fractures.[20] Smoking is associated with a modest increase in osteoporotic fracture rate, and especially hip fracture rate. A minority (23%) of this increased risk is attributable to lower BMD.[21] A meta-analysis has shown that daily alcohol or >10 standard drinks per week increases the risk of fracture in men by 28%.[22] Low body mass index (BMI) has also been shown to be associated with lower bone density after menopause, and more rapid bone loss than in women with a higher BMI.[18] Other risk factors include immobility; vitamin D deficiency; and certain medications, especially corticosteroids, excessive thyroxine, anti-androgen and anti-oestrogen treatments, selective serotonin re-uptake inhibitors, thiazolidenediones and particular anti-epileptic drugs.[19]

Two fracture risk calculators are available and recommended for use.[8] **FRAX** (Fracture Risk Assessment Tool) was developed at the University of Sheffield in conjunction with the WHO, and uses country-specific data to calculate a 10-year risk of major osteoporotic fracture, and a 10-year risk of hip fracture. It is available as a web-based version or a mobile app (refer to 'Resources'). The **Garvan Fracture Risk Calculator** is an Australian calculator that includes input on the number of falls in the last 12 months (refer to 'Resources'). Note that both calculators can be used without BMD (DXA) results. These calculators have not been validated using data from Indigenous populations.

The evidence is mixed on how accurate these calculators are. For people at the highest risk, they are probably not necessary because treatment is indicated already. They may be useful for people who are in the osteopenic range who are nonetheless at moderate risk (tipping the balance towards preventive treatment); conversely, they may be useful in preventing over-treatment in people who are at low risk. Note that the absolute fracture risk calculated does not take into consideration the different criteria for qualifying for subsidised medications under the Pharmaceutical Benefits Scheme (PBS). Research is continuing into whether the use of these calculators to support clinical decision making for populations is cost effective.[8]

Interventions

Calcium intake

The recommended daily intake of calcium varies according to age. The best dietary sources of calcium are milk, hard cheeses and yoghurt. Other sources with moderate calcium content include firm tofu, almonds, sesame seeds, tinned fish, some green leafy vegetables and calcium-enriched soy milk.[8] The evidence around dietary calcium and fracture risk is mixed, with some studies showing an increased risk of fracture in people with the lowest quintile of self-reported calcium intake.[23] However, meta-analyses have failed to demonstrate a correlation between dietary calcium intake and fracture risk. In addition, there is some evidence of harm with supplemental calcium, and supplements are not generally recommended. However, dietary intake should be assessed in people who are commencing specific anti-osteoporosis therapies as the effectiveness of these medications was researched in people who were calcium and vitamin D replete. Those commencing medication may need calcium supplementation.[8]

Vitamin D

Vitamin D is primarily formed in the skin from sunlight exposure, although small amounts are found in the diet. How much is produced in the skin depends on the colour of the skin, the geographical location and the time of year.[24] In winter, in southern parts of Australia, and in people with darker skin, this exposure needs to be longer. The evidence for the use of vitamin D supplementation in preventing bone loss and osteoporotic fractures is mixed. A benefit has been shown for treating those at high risk of vitamin D deficiency (eg residents of aged care facilities and housebound people), and for these groups, vitamin D supplementation is considered standard care. For those in the community, the results are less clear and supplementation is not usually necessary. The benefits of specific anti-osteoporotic therapies have been demonstrated in the context of adequate vitamin D levels. Patients who are to be commenced on specific anti-osteoporotic medication should have their vitamin D levels checked and should commence supplementation if their level is less than 50 nmol/L.[8]

Exercise

Regular, high-intensity weight-bearing exercise has been shown to slow bone density loss in postmenopausal women and older men. High-impact activities such as jogging, dancing, tennis and step aerobics are effective for increasing bone strength in those without joint problems and not at risk of falling. Strength and resistance training (such as weight lifting) is also recommended and should be progressive and varied, and ideally should be performed for about 30 minutes, two to three times per week.[8] For bone health, short, intense exercise sessions are better than prolonged, less intense exercise. High-intensity balance training, which involves standing with feet close together or on one leg and challenges balance, does not increase bone strength but does decrease the risk of falling and fractures.[25] There is some evidence that regular exercise across the lifespan increases bone density. Children and adolescents who are more active achieve higher bone density, and this is maintained into middle age.[26]

People diagnosed with osteoporosis need to have physical activity recommendations modified because of their increased risk of fracture. They should undergo high-intensity resistance training and balance training.[8] High-intensity strength training is the use of moderate to high overload resistance to increase muscle strength and BMD. High impact activities such as jumping are not appropriate for people with established osteoporosis. A physiotherapist, exercise physiologist or other appropriately trained professional should supervise the introduction of an exercise program for people with osteoporosis.

Smoking cessation

Current smoking and a history of smoking are associated with an increased risk of fracture, even after accounting for BMI (people who smoke tend to have lower BMI).[21] The increased risk of fracture significantly declines from around 10 years after giving up smoking.[27]

Hip protectors

Hip protectors are either foam pads (soft) or plastic shields (hard), which are worn over the hips in specially designed underwear. They act to protect the hips in case of a fall to the side. They have been shown to reduce the risk of hip fracture in older people living in aged care facilities, though the number needed to treat (NNT) for one year to prevent one fracture is 91. They have not been shown to reduce the risk of hip fracture among people living in the community, probably because people choose not to wear them.[28]

Pharmacological treatment

There is some evidence that Aboriginal and Torres Strait Island people may have osteoporotic fractures at an earlier age, but there is little evidence to guide whether pharmacological recommendations based on age cut-points should be revised.

Bisphosphonates

Bisphosphonates may be used in both primary prevention and after osteoporosis is established.[29] In a Cochrane review, biphosphonates were shown to prevent vertebral fractures (but not hip or other non-vertebral fractures) in primary prevention studies of postmenopausal women.[29] For vertebral fractures, the NNT is 50 for primary prevention, but 17 for secondary prevention. In those with osteoporosis (ie secondary prevention), the number needed to prevent a hip fracture is 100, and to prevent other non-vertebral fractures is 50.[29] The benefit is greatest for those at highest risk of fracture. Note that bisphosphonates are not listed on the PBS for primary prevention. They are listed for those with fractures due to minimal trauma, those with low BMD and aged over 70 years, and those on long-term corticosteroids with a BMD T-score of 1.5 or less.[30]

Denosumab

Denosumab may be used for those with established osteoporosis, and after fracture in both women and men. It is given as a six-monthly injection. It is a human monoclonal IgG antibody that binds to specific proteins responsible for bone resorption, thereby preventing bone resorption and increasing bone mass and strength.

Over three years, the NNT to prevent one fracture in women with osteoporosis varies from 21 for new vertebral fractures, 67 for non-vertebral fractures, and 200 for hip fractures.[31] There is evidence for effectiveness in increasing BMD in men treated with denosumab, though as yet limited data around fracture reduction in men.[8]

Hormone replacement therapy

Oestrogen +/– progestogens are effective in improving BMD and reducing the risk of fractures in postmenopausal women. They have been shown to be effective in primary prevention and in treating established osteoporosis.[29] However, there are adverse effects, including an increased risk of breast cancer, stroke and thromboembolic events. These risks seem to be less in women commenced on hormone replacement therapy (HRT) within 10 years of the menopause, and younger women in general have a lower baseline risk of vascular events.[29] The potential benefits and harms must be carefully considered. However, there are benefits for the bones for women using HRT for management of menopausal symptoms. Long-term use is not recommended in current guidelines.[8,20]

Recommendations: Osteoporosis					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	All postmenopausal women and men over 50 years of age	Assess risk factors for osteoporosis (Box 1)	As part of an annual health assessment	IIB	8
	People at moderate and high risk (Box 1)	Measure bone mineral density (BMD)* by dual-energy X-ray absorptiometry (DXA) scanning on at least two skeletal sites, including the lumbar spine and hip, unless these sites are unsuitable (eg due to hip prosthesis) If DXA confirms osteoporosis then manage as high risk (refer to recommendations below for behavioural, chemoprophylaxis and environmental interventions)	At baseline, then as needed, depending on baseline BMD and management Repeat if it will change management, generally no more frequently than second yearly	IA	8
Behavioural	All postmenopausal women and men >50 years of age at all levels of risk	Advise adequate dietary calcium intake: 1300 mg/day for women >50 and men >70 years of age; 1000 mg/day for men 50–70 years of age	Opportunistic and as part of an annual health assessment	IA for bone loss, III–2 for fracture prevention	8
		Recommend smoking cessation (refer to Chapter 1: Lifestyle, 'Smoking')		IA	21
		Advise adequate but safe sunlight exposure as a source of vitamin D[1]		IIC	24
		Avoid excessive alcohol consumption		IIC	22
	Residents of aged care facilities (RACFs) at risk of falling	Consider the use of hip protectors to lower the risk of harm related to a fall		IA	28
	Individuals >50 years of age without osteoporosis	Recommend regular high-intensity weight-bearing exercise if appropriate. Recommend progressive resistance training and balance training. Resistance exercise should be regular (2–3 days per week), moderate–vigorous, progressive and varied	Opportunistic	IA	5, 8
	Individuals with osteoporosis	Recommend low-impact, high-intensity progressive resistance and balance training Frequency as above Examples of low-impact activities include standing activities with one foot always on the floor			

Recommendations: Osteoporosis					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	All postmenopausal women and men >50 years of age at all levels of risk	Calcium and vitamin D supplementation are not recommended for routine use in non-institutionalised older people		IC	8
	People at high fracture risk: • with previous fragility fracture • T-score of –2.5 or less† • on long-term corticosteroids with a T-score of 1.5 or less	Consider specific anti-osteoporosis medication: • bisphosphonates‡ • denosumab§ • oestrogen replacement Consider calcium supplementation in people at high risk being treated with specific osteoporosis medications, if their dietary calcium intake is <1300 mg daily People being treated with a specific osteoporosis medication should have vitamin D supplementation prior to commencement if their level is <50 nmol/L	At diagnosis	IB for denosumab in men IA for all others	8
Environmental	People at high risk of fracture	Consider a multifactorial falls reduction program (refer to 'Recommendations: Falls')	At diagnosis	ID	

*Bone densitometry testing is available on the Medicare Benefits Schedule (MBS) for the following groups:
- people >70 years of age
- people with one or more fractures occurring after minimal trauma
- follow-up of people with established low BMD
- people with one of the following medical conditions putting them at increased risk
  - prolonged glucocorticoid therapy
  - conditions associated with excess glucocorticoid secretion
  - male hypogonadism
  - female hypogonadism lasting more than six months before the age of 45 years
  - primary hyperparathyroidism
  - chronic liver disease
  - chronic renal disease
  - proven malabsorptive disorders
  - rheumatoid arthritis
  - conditions associated with thyroxine excess.[32]

†A T-score of –2.5 or lower is diagnostic of osteoporosis, and a T-score between –1.0 and –2.5 is diagnostic of osteopenia.
‡Bisphosphonates are subsidised under the Pharmaceutical Benefits Scheme (PBS) for the following conditions:
- concurrent use of oral corticosteroids (>7.5 mg/day prednisone or equivalent) for three months or more and a BMD T-score of –1.5 or less
- people aged ≥70 years with a BMD T-score or –2.5 or less
- any person with a radiologically confirmed fracture due to minimal trauma.[30]

§Denosumab is subsidised under the PBS for:
- people aged ≥70 years with a BMD T-score or –2.5 or less
- any person with a radiologically confirmed fracture due to minimal trauma.[30]

Notes:
1. The recommendations for sun exposure vary by latitude, skin colour and time of year. For more information, refer to 'Resources'.
2. Refer to clinical practice guidelines for specific treatment recommendations.[8]

Box 1. Risk levels for osteoporosis[8]

Average risk	Moderate risk	High risk
All postmenopausal women and men aged >50 years	Aged >70 years	Previous fracture due to minimal trauma
	Aged 60–70 years and any of the following: • family history of osteoporotic fractures • history of falls • smoking • high alcohol intake (>4 standard drinks per day for men and >2 for women) • prolonged immobility or poor mobility (eg unable to leave the house or do housework) • low body weight (BMI <20) and unintentional weight loss • medical conditions causing secondary osteoporosis, such as – endocrine disorders: hypogonadism, hyper-parathyroidism, hyperthyroidism, Cushing's syndrome – premature menopause – anorexia nervosa or >1 year amenorrhoea before age 45 years, not related to pregnancy – inflammatory conditions (eg rheumatoid arthritis) – malabsorption (eg coeliac disease) – chronic kidney or liver disease – multiple myeloma or monoclonal gammopathies – HIV and its treatment – diabetes type 1 and type 2 • on medications such as – prolonged glucocorticoid use (>7.5 mg for >3 months) – anti-convulsants – aromatase inhibitors – anti-androgens – excessive thyroxine – possibly selective serotonin reuptake inhibitors (SSRIs)	Vertebral fractures with minimal trauma These fractures should be ruled out if clinically suspected due to loss of height >3 cm, kyphosis or back pain

Resources

- Garvan Institute, Garvan Fracture Risk Calculator, www.garvan.org.au/promotions/bone-fracture-risk/calculator/index.php
- Osteoporosis Australia, guidelines for exercise in preventing and treating osteoporosis, www.osteoporosis.org.au/exercise
- Osteoporosis Australia, sun exposure recommendations, www.osteoporosis.org.au/vitamin-d
- The Royal Australian College of General Practitioners (RACGP), *Osteoporosis prevention, diagnosis and management in postmenopausal women and men over 50 years of age*, 2nd edn, www.racgp.org.au/your-practice/guidelines/musculoskeletal/osteoporosis
- The Royal Australian College of General Practitioners (RACGP), 'Osteoporosis risk assessment, diagnosis and management', www.racgp.org.au/download/Documents/Guidelines/Musculoskeletal/osteoporosis-algorithm.pdf
- SunSmart, SunSmart app, advice for sun protection according to location and weather forecast information, www.sunsmart.com.au/tools/interactive-tools/free-sunsmart-app
- University of Sheffield, FRAX (Fracture Risk Assessment Tool), www.shef.ac.uk/FRAX/tool.aspx?country=31

Falls

Background

A fall is defined as 'an event which results in a person coming to rest inadvertently on the ground or floor or other level'.[33] Studies in Australia and similar countries have demonstrated that 30–40% of people over the age of 65 years fall each year, and a proportion of these will have serious injuries and require hospitalisation.[34] Half of all falls occur in the home, mostly during the day, and mostly due to 'slipping, tripping and stumbling'.[35] Ten to fifteen percent of those who fall will sustain serious injuries, with 2–6% sustaining fractures and 0.2–1.5% sustaining a hip fracture.[34] Hip fractures cause significant mortality, with about 13% dying during hospitalisation[36] and about 27% dying over the following year.[37] They are associated with significant morbidity (eg permanently decreased mobility), and in some people a fall will precipitate residential placement in an aged care facility. In Australia, falls account for 3.8% of hospital separations and 9.3% of all hospital-bed days for people aged 65 years and over.[35] A fall (whether or not it results in serious injury) may also result in a fear of falling, and consequent decreased mobility and independence, which in turn may increase the chance of the person subsequently requiring residential care.

Aboriginal and Torres Strait Islander peoples have increased rates of hospitalisation for falls when compared with other Australians, especially in the 25–65 years age group, but the average length of stay is shorter.[35] This suggests that the increased risk for falling due to age is occurring at a younger age in Aboriginal and Torres Strait Islander people, but that the average severity of injury may be less. However, the number of Aboriginal and Torres Strait Islander people in the over-55 age group is increasing rapidly,[2] and the number of falls in older people may increase proportionally. Emerging evidence suggests that the rate of hip fracture in Aboriginal and Torres Strait Islander peoples may be higher than that of the general population (refer to 'Osteoporosis' section).

Interventions

Exercise has been shown to reduce both the risk of falls and rate of falling. The relative risk reduction is higher for fractures and injurious falls compared with all falls.[38] Studies have shown benefits for populations at average and above-average risk of falling, and all older people should be encouraged to engage in exercise for falls prevention.[39] People at higher risk of falls have a higher rate of falling and injuries and are likely to benefit most, but will need to have additional input into the design of their exercise program so as to prevent falls occurring during the exercises. A physiotherapist or similar professional is able to assess the person's current abilities and design an appropriate exercise program.

The most effective strategy for reducing the risk of falls is balance training. Depending on the abilities of the person, this may involve challenging balance by standing with feet together, or on one foot, and using less to no support from upper limbs. Controlled movement of the body's centre of mass, such as in tai chi, improves balance. However, most of the exercise programs that have demonstrated benefit in trials have combined balance training with another exercise component addressing gait, flexibility, strength training or endurance.[38] Also, programs with the most benefit have had higher 'doses' of exercise, at least two hours per week for about six months.

In addition to improving balance, exercise may reduce the risk of falls and injuries from falls by benefiting cognition and reaction times, such as righting reflexes or the ability to grab onto objects to break a fall. Additionally, exercise may increase muscle mass and thereby protect bones and other tissues from the impact of a fall.[38]

Effective exercise programs should be at least two hours per week and can be home or group based, or a combination of the two (eg a group session complemented by exercises practiced at home). Exercise should be continued long term for ongoing benefits.

Brisk walking alone has not been shown to prevent falls: though it may have other benefits, it should be prescribed with caution as it can increase the risk of fractures in some older people. It may be included after with other types of exercise after assessing safety for the individual.

Balance and strength decline with age and it is likely that exercise in mid-life prevents falls and injuries from falls later in life.[39] This is difficult to prove using randomised controlled trials (RCTs) because of the long time required for follow-up but is suggested by observational studies.[39]

For people with a history of falls, or who are deemed high risk (Box 1), a thorough evaluation is required. This should involve a detailed history of recent falls and known medical conditions and a thorough examination. These people will require an assessment of balance, of medication use, and of issues such as vision, incontinence and cognition. Interventions to prevent falls can then be tailored to the needs of the individual. Home-based safety assessment and modification interventions (particularly when delivered by an occupational therapist or similar professional) and review of medication by a pharmacist are effective in reducing the rate of falls and the risk of falling, particularly for those at high risk of falling.[40]

For people in aged care homes, regular assessment of falls risk should be conducted by staff from the facility, and interventions tailored to the person's needs. Regular review of medications (especially psychotropic medications) is essential and annual review of medications by a pharmacist is recommended. Evidence regarding exercise programs for people living in aged care facilities is mixed, and strength and balance exercises should be undertaken with supervision by an appropriate professional.[41]

Recommendations: Falls

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All people aged ≥50 years at all risk levels	Assess for risk factors for falls (Box 1). If at high risk, refer for multifactorial falls assessment – refer to below	Annually	IA	5, 40
	Residents of aged care facilities (RACFs)	RACF staff should screen for risk factors for falls to allow for an individualised fall prevention plan	On admission, then six-monthly	IIB	34, 41
	People with a past history of falls or at high risk	Recommend a detailed assessment, including the following: • cardiac and neurological disease assessment • medication review • assessment of vision, gait and balance • home environment assessment, possibly most effective if conducted by an occupational therapist	Opportunistic	IA	5, 40
	Those with falls due to carotid sinus hypersensitivity	Consider referral for pacemaker insertion	As needed	IIC	40
	Those with vision threatening cataract disease	Referral for cataract surgery (first eye)	As needed	IIC	40
Behavioural	All people aged ≥50 years	Recommend regular exercise, which may include the following modalities: • multicomponent group exercise (defined as targeting at least two of the following: strength, balance, endurance and flexibility) • individually prescribed multicomponent exercise to be carried out at home as per Australian physical activity guidelines (refer to Chapter 1: Lifestyle, 'Physical activity': Box 1) • tai chi as a group exercise	As part of an annual health assessment	IA	38, 40

Recommendations: Falls					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	People at high risk	Recommend gait, balance and functional coordination exercises as part of a multifactorial intervention	As part of an annual health assessment	IIC	
Chemo-prophylaxis	People aged ≥50 years with known vitamin D deficiency or inadequate exposure to sunlight	Consider vitamin D supplementation (refer also to 'Osteoporosis' section)	As part of an annual health assessment	IC	40
	People at high risk taking medications	Review the number and type of medications and assess whether they may increase falls risk	At least annually and recommend six-monthly for people taking four or more medications	IIB	34
		If taking psychotropic medications, review the indications and consider gradual withdrawal if clinically appropriate	Opportunistic and as part of an annual health assessment	IIC	34, 42
		Consider a home medication review by a pharmacist	Annually or when there is a clinical need	IIB	43, 44
	People in RACFs	Arrange medication review by a pharmacist	Annually	IIA	34
		Consider vitamin D supplementation (refer to 'Recommendations: Osteoporosis')	Ongoing	IA	41
Environmental	All people aged >50 years at moderate to high risk of falls	Arrange for home assessment and modification, preferably by an occupational therapist	Once off for those with poor vision Opportunistic for all others	IA	40
	People in RACFs who are at high risk of falls	Consider use of hip protectors to lower the risk of harm related to a fall (refer to 'Recommendations: Osteoporosis')	Opportunistic	IIB	28

Box 1. Risk factors for falls

Risk factors for falls in older people include:[45]

- increasing age
- past history of falls
- neurological conditions: stroke, Parkinson's disease, peripheral neuropathy
- multiple medications
- psychotropic medications
- impaired balance, gait and mobility
- reduced muscle mass
- visual impairment
- cognitive impairment
- depression
- fear of falling
- low levels of physical activity

Dementia

Background

Dementia is a syndrome of impairment of brain functions, which may include changes in language, memory, perception, personality and cognitive skills, caused by a range of disease processes.[46] In general, consciousness is not impaired but thinking is disordered. Impairment in activities of daily living are required to meet diagnostic criteria for the International Classification of Diseases, 10th Revision (ICD-10).[47] The *Diagnostic and statistical manual of mental disorders*, 5th edition (DSM-5), renames dementia as major neurocognitive disorder, and its diagnosis requires interference with independence with everyday activities (at a minimum, requiring assistance with complex instrumental activities of daily living such as paying bills or managing medications).[48]

In Australia, Alzheimer's disease accounts for approximately 50% of cases of dementia. Vascular dementia accounts for another 20%. Some people have features of both and may be described as having 'mixed' dementia. Dementia with Lewy bodies (protein deposits in nerve cells in brain regions responsible for cognitive and motor functions) causes about 15% of cases and has some distinguishing features such as prominent visual hallucinations, marked fluctuations and Parkinsonian motor signs. Frontotemporal dementia is responsible for less than 5% of cases but proportionately more cases of early onset dementia, and is distinguished by prominent behavioural symptoms, language difficulties, personality change and impaired executive function. There are also many rarer causes of dementia.

A number of medical conditions need to be excluded in people presenting with symptoms or signs of dementia, as treatment may fully or partially reverse the cognitive impairment. Delirium, if present, must be detected and the cause treated. Other conditions that may mimic or exacerbate dementia include thyroid disorders (hypothyroidism or thyrotoxicosis), vitamin deficiencies (most commonly B12 and folate), depression, electrolyte disturbances and normal pressure hydrocephalus. Medications frequently cause or exacerbate cognitive problems.

People with dementia are at an increased risk of falls, fracture, delirium, depression, and epilepsy. They are also at increased risk of oral disease, malnutrition and weight loss, and urinary incontinence.

Following the development of the Kimberley Indigenous Cognitive Assessment (KICA) tool, a prevalence study in the Kimberley documented a dementia prevalence of 12.4% in those aged over 45 years and 26.8% in those aged over 65 years, or five times the rate in the overall Australian population.[47] This has been followed up by a study in urban and regional New South Wales using a modified form of the KICA, which demonstrated an age-standardised rate of 21% in Aboriginal people aged 60 years and older, three times the rate in the general population.[49] In this study, which involved specialist clinical assessment, types of dementia diagnosed were similar to those for the general population, with 44% being diagnosed with Alzheimer's disease and 17% with vascular dementia. In the Northern Territory, a data linkage study of the population has demonstrated a higher incidence and prevalence of dementia in Northern Terrritory Aboriginal and Torres Strait Islander people, with higher rates at younger ages.[50]

In the Kimberley remote population, factors associated with dementia included older age, male gender and no formal education. After adjusting for these factors, dementia was independently associated with current smoking, previous stroke, epilepsy, head injury, poor mobility, incontinence and falls.[51]

At follow-up five years later, risk factors for declining cognition were stroke, head injury, analgesic medication, low BMI and higher systolic blood pressure.[52]

Interventions

Population-based interventions for preventing the onset of dementia are a new area of interest. Increased levels of education are protective against dementia, a finding which seems robust and cross-cultural,[53] and so increasing the access of Aboriginal peoples to education is likely to reduce their future risk of dementia. Vascular risk factors such as smoking and diabetes are strongly associated with dementia risk, and population-based interventions are likely to be useful. In fact, because of the long time to develop the changes leading to dementia, many of the recommendations to reduce risk are best enacted in midlife.

Other preventive interventions include management of depression, improving social engagement, and cognitive training exercises.[5]

An Australian evidence-based self-assessment tool developed by the Australian National University called the Alzheimer's Disease Risk Index (ANU-ADRI) can be used by individuals or clinicians to assess risk factors and protective factors for Alzheimer's disease.[54] The ANU-ADRI includes assessment of risk factors such as family history, education attainment and history of head injuries, but also modifiable lifestyle factors such as activity levels, social engagement and cognitive activity. It takes approximately 10–15 minutes to complete. Participants receive feedback regarding protective factors and factors that can be modified to decrease risk. It can be used to guide participants to engage in risk-reduction activities but it is not intended to be used as a screening or diagnostic tool and it has not been validated in Aboriginal and Torres Islander peoples. It could be included in a well person's check along with cardiovascular risk calculation.[55] More research is needed to assess its effectiveness on clinical outcomes.

Routine well-person's screening for dementia is not recommended in current guidelines.[56] However, early case finding is important because there is some evidence that early non-pharmacological intervention may improve cognitive outcomes for people with early cognitive impairment. Early case finding allows the early detection of reversible causes or exacerbating factors for cognitive decline. Early diagnosis also allows the person with dementia to make plans for the future, including for issues such as enduring power of attorney, while they are still able to do so.[57] In a non-Indigenous cohort the delay between family members noticing symptoms of dementia and the person receiving a diagnosis averaged over three years.[58] This is unlikely to be shorter for Aboriginal people, and so awareness of concerns from family members and enquiring about memory is important.[5]

There may be significant stigma associated with a diagnosis of dementia. Older Aboriginal and Torres Strait Islander people have important roles in culture and community and these could continue to be performed adequately when a person has mild cognitive impairment.[59] Thus current guidelines recommend a case-finding approach (conducting further evaluation in those presenting with symptoms) rather than screening.[5] Opportunistic case finding should be pursued in Aboriginal and Torres Strait Islander people over the age of 50 years.

Case finding involves being alert for concerns raised by the individual or family members. Cognition is evaluated using a screening tool. The Mini Mental State Examination (MMSE) has been evaluated in urban and regional New South Wales Aboriginal populations and has good sensitivity and specificity.[60] The KICA tool has been developed for use with people living in remote areas and those who may have had little formal schooling.[61] It has also been modified for Aboriginal peoples living in urban and regional Australia and performs well.[60] Interpreters may be required for the assessment.

There is evidence of benefit from cholinesterase inhibitors (donezpeil, rivastigmine, galantamine) for symptomatic management of mild to moderate dementia, particularly in Alzheimer's disease and Lewy body dementia. However, there is no evidence that these medications are effective in reducing the risk of dementia in people with mild cognitive impairment and there is no medication intervention that has been shown to be effective in preventing the onset of dementia.[62–64]

Recommendations: Dementia

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	Asymptomatic people	Dementia screening is not routinely recommended		IIC	56, 65
	People with any of the following: • symptoms such as memory loss or behaviour change • concerned family members • history of repeated head trauma • Down syndrome • elevated cardiovascular risk • depression or a history of depression	Over several consultations, obtain history from the person and their family, and perform a comprehensive physical examination Consider administration of one of the following cognitive screening tests: • Mini Mental State Examination (MMSE) • General Practitioner Assessment of Cognition (GPCOG) • Kimberley Indigenous Cognitive Assessment-Cog (KICA-Cog) or modified KICA-Cog (Refer to 'Resources')	Opportunistic	IIIC	5, 66, 67

Recommendations: Dementia					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	People with risk factors for dementia including excessive alcohol intake, tobacco smoking, hypertension, diabetes, depression	Recommend the following for prevention and early intervention: • regular physical activity (150 minutes per week of moderately intense walking or equivalent) • increased social engagement and activities • cognitive training and rehabilitation • diet – Mediterranean diet has been shown to be effective • smoking cessation	Opportunistic	GPP	5
Chemo-prophylaxis	People without a confirmed diagnosis of dementia	Anti-dementia drugs are not recommended		IB	68

Resources

- Alzheimer's Australia, Dementia Collaborative Research Centres, *Dementia risk reduction: A Practical guide for general practitioners*, www.dementia.unsw.edu.au/images/dcrc/pdf/drrgps.pdf
- Australian National University Alzheimer's Disease Risk Index (AUS-ADRI), self-assessed report on Alzheimer's disease risk factor exposure for individuals who wish to know their risk profile and areas where they can reduce their risk, https://anuadri.anu.edu.au
- General Practitioner Assessment of Cognition (GPCOG), online screening tool for cognitive impairment, www.gpcog.com.au
- Guideline Adaptation Committee, *Clinical practice guidelines and principles of care for people with dementia: Recommendations*, http://sydney.edu.au/medicine/cdpc/documents/resources/LAVER_Dementia_Guidleines_recommendations_PRVW5.pdf
- Independent Hospital Pricing Authority (IHPA), Standardised Mini-Mental State Examination (MMSE), www.ihpa.gov.au/sites/g/files/net636/f/publications/smmse-tool-v2.pdf
- Western Australia Centre for Health and Ageing (WATCHA), Kimberley Indigenous Cognitive Assessment (KICA):
  - A cognitive assessment tool for Aboriginal and Torres Strait Islander people who may have had little formal schooling. The standard KICA is used for people from remote parts of Australia. A modified version (mKICA) can be used for people from urban or regional areas. Interpreters may be required if the person is not fluent in English, www.perkins.org.au/wacha/our-research/indigenous/kica
  - The full KICA tool includes history and a carer report, as well as the cognitive screen (KICA-Cog) and the pictures required to perform the assessment. There is also an instruction booklet and videos of the assessment being performed.

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Chapter 6: Eye health

Visual acuity

Background

Eye health is critical to quality of life. In 2016, more than 453,000 Australians were living with vision impairment or blindness. Based on the 2016 National Eye Health Survey (NEHS) and age-adjusted population data, it is estimated that this includes up to 18,300 Aboriginal and Torres Strait Islander people aged 40 years or older.[1] Approximately 90% of vision impairment and blindness among both Aboriginal and Torres Strait Islander people and non-Indigenous Australians is preventable or treatable.[1] In the 2016 NEHS, a person with vision impairment was defined as having visual acuity between <6/12 and 6/60 in the better eye and a person with blindness was defined as having visual acuity <6/60 in the better eye.[1]

Impaired vision often goes unrecognised and contributes significantly to morbidity.[2] The National Indigenous Eye Health Survey (NIEHS) in 2009 reported eye/sight problems as the most common self-reported long-term health condition.[3,4] In the elderly, visual impairment is a risk factor for falls, hip fractures, depression, social and functional decline and increased mortality.[5–10] An association between visual impairment and increased mortality has also been shown in Aboriginal people in Central Australia.[11]

The age-adjusted prevalence of vision impairment in Aboriginal and Torres Strait Islander peoples is 13.6%, three times higher than rates for non-Indigenous Australians.[1] Similarly, the age-adjusted prevalence of blindness in Aboriginal and Torres Strait Islander peoples is three times higher compared to non-Indigenous Australians (0.36% versus 0.12%).[1] These rates are even higher in Aboriginal peoples in Central Australia.[12] The highest prevalence of vision impairment in Aboriginal and Torres Strait Islander peoples occurs in outer regional areas. By contrast, vision impairment in non-Indigenous Australians does not exhibit a substantive regional variation.[1]

The main causes of vision impairment in both Aboriginal and Torres Strait Islander peoples and non-Indigenous Australians are uncorrected refractive error (approximately 60% in both Aboriginal and Torres Strait Islander peoples and non-Indigenous Australians) and cataract (20.2% in Aboriginal and Torres Strait Islander peoples and 13.9% in non-Indigenous Australians). This highlights that approximately 80% of vision impairment is treatable with spectacle correction or cataract surgery.[1] In the 2009 NIEHS, over a third of participants (39%) could not read normal size print, and 62% reported they normally wore reading glasses for near-work (eg reading, sewing).[4] Of those with near-vision impairment, 37% reported not having near-vision correction.[13] Diabetic retinopathy (DR) as a cause of vision impairment in Aboriginal and Torres Strait Islander peoples is more than three times more prevalent than in non-Indigenous Australians (5.5% versus 1.5% respectively). Age-related macular degeneration and glaucoma are relatively uncommon and account for 1.1% and 0.65% respectively of vision impairment in Aboriginal and Torres Strait Islander peoples.[1]

The main cause of blindness in Aboriginal and Torres Strait Islander peoples is cataract (40%).[1] Other causes include diabetic retinopathy (20%), optic atrophy (20%) and a combination of mechanisms (20%).[1] The primary cause of bilateral blindness in non-Indigenous Australians is age-related macular degeneration (71.4%).[1] The NIEHS showed that uncorrected refractive error is also an important cause of blindness in Aboriginal and Torres Strait Islander peoples (14%), five times higher than in non-Indigenous Australians, and trachoma still contributes significantly to blindness in Aboriginal people, particularly in Central Australia.[3,12] Around 6% of Aboriginal and Torres Strait Islander people in the NIEHS with vision loss were newly identified and had not had the condition diagnosed previously.[1]

Cataract surgery occurs less often in Aboriginal and Torres Strait Islander people than in non-Indigenous Australians (61.5% versus 87.6%),[1,14] and treatment coverage of refractive error in Aboriginal and Torres Strait Islander people is 83.3% compared with 93.7% in non-Indigenous Australians.[1] Only around one half of Aboriginal and Torres Strait Islander people with self-reported diabetes report having undergone a diabetes eye examination within the last year, as recommended by National Health and Medical Research Council (NHMRC) guidelines, with significantly lower rates of eye examination in very remote areas.[1]

Interventions

Evidence for the effectiveness of preventive interventions

Vision screening in children

Available literature and many professional guidelines generally recommend a check for congenital eye conditions within the first three months of life.[15] The project advisory group from the National Children's Vision Screening Project (NCVSP) in 2009 also recommended vision assessments for children between the ages of three and six months.[16,17]

For older children, the NCVSP, two recent Australian reviews and the US Preventive Services Task Force (USPSTF) recommend vision screening at least once between the ages of three and five years.[15–17,67] Screening should aim to detect diminished visual acuity, and follow-up screening and treatment should be available for those who require it. Referral criteria are dependent on the age of the child and include a visual acuity less than 6/9 in either eye for a three-year-old and 6/9 or less in either eye for a 4–6-year-old.[15]

In Australia, the prevalence of amblyopia in children ranges from 1.4% to 3.6%, while strabismus ranges from 0.3% to 7.3% and refractive error ranges from 1% to 14.7%. Aboriginal and Torres Strait Islander children are five times less likely to have vision impairment than non-Indigenous children,[16] with less refractive error and strabismus; however, refractive error is the cause of about 50% of visual impairment in Aboriginal and Torres Strait Islander children.[4] Convergence insufficiency and reduced visual information processing skills appear to be more common in Aboriginal and Torres Strait Islander children when compared to non-Indigenous children.[18]

In addition to routine vision screening, Aboriginal and Torres Strait Islander children living in rural and remote areas should be screened for trachoma when there is increased risk.

Further, children with a history of prematurity, birth weight less than 1500 g, and developmental delay or disability, should have more comprehensive eye testing and follow-up as they are at increased risk of vision impairment.[16] In Australia, each state and territory health department has separate guidelines for paediatric vision screening.[17] These guidelines are all generally in keeping with the above evidence.[7,17,19–22]

Vision screening in adults

Although there is insufficient evidence to assess benefits and harms of population-based screening for visual acuity in otherwise well adults, visual acuity screening is advocated in older people because refractive errors are correctable with eyeglasses and have good outcomes with refractive surgery if available.[23,24] The Royal Australian College of General Practitioners' (RACGP's) *Guidelines for preventive activities in general practice* (Red Book) recommends assessment of visual acuity in Australians from 65 years of age if requested or symptomatic.[7]

The substantially higher prevalence and under-diagnosis of vision impairment in Aboriginal and Torres Strait Islander peoples, along with poorer access to corrective services, warrants routine visual acuity screening in all age groups in this population. An eye examination is a mandatory requirement for a 'Medicare Health Assessment for Aboriginal and Torres Strait Islander Peoples Health Assessment' (MBS item 715; refer to 'Resources'),[25] and this is supported by recommendations in the *CARPA standard treatment manual* (7th edn) and the Queensland *Chronic conditions manual*.[19,20]

Testing vision

The standard (Snellen) eye chart and tumbling E chart are the most suitable tools to assess visual acuity.[20] The CRANAplus *Remote primary care manual* also includes the option of using Lea charts.[26] Screening questions are not as accurate as visual acuity testing for identifying visual acuity impairment.[27,28] The E-test visual acuity charts for near and distance vision are useful for people who cannot read Roman letters[29] and were used routinely in the NIEHS.[4] The need to test near or 'reading' vision, especially in those aged over 40 years, is of even greater importance. Near vision test cards or in fact any printed matter can be used to test near vision, and E-tests for near vision can also be used for the those who cannot read.[26]

Cataract

Cataract surgery has been shown to improve vision[27,30] and quality of life,[30] and reduce the risk of car crash[31,32] and the rates of falls in older people.[33,34] A case record audit in the Northern Territory (NT) found cataract surgery had a beneficial effect on visual acuity and quality of life for Aboriginal and Torres Strait

Islander people.[35] Risk factors for cataract include age,[36–38] cumulative ocular exposure to ultraviolet light,[36–40] diabetes and poor diabetic control,[37,41] smoking,[36–38,42] alcohol use,[37,38] family history of cataract, ocular injury, use of corticosteroids and high myopia.[37] Although exposure to sunlight accounts for only 10% of cataracts in urban, non-tropical Australian settings,[40] this risk factor may be more important in northern Australian populations. Data collected from the NIEHS showed that approximately 20% of Aboriginal and Torres Strait Islander respondents reported never wearing sunglasses or a hat and that use of sun protection was significantly lower in people in the NT compared with New South Wales and in people living in remote and very remote areas compared with urban areas.[43] The *Specialist eye health guidelines for use in Aboriginal and Torres Strait Islander populations* recommends decreased exposure to ultraviolet B light and cigarette smoking to prevent cataract.[38] A diet high in fruit and vegetable intake is associated with a lower risk of developing cataract,[37] and a recent meta-analysis indicated a clinically relevant reduction in cataract incidence associated with statin use.[44]

Diabetic retinopathy

The overall prevalence of DR in those with known diabetes in Australia is around 25%.[45–47] The crude prevalence is similar between Aboriginal and Torres Strait Islander and non-Indigenous populations.[47] However, as diabetes is far more prevalent among Aboriginal and Torres Strait Islander Australians, the proportion of those affected by DR across these peoples should be considerably higher when compared with non-Indigenous Australians.[45] Around 8% of Aboriginal people living in Central Australia with diabetes have vision-threatening DR,[45] and the annual incidence of DR among patients with diabetes in Central Australia is approximately 9%.[48]

Duration of diabetes is the strongest factor determining DR prevalence;[38,49–51] however, early onset DR (within 10 years of onset of diabetes) is more common in Aboriginal and Torres Strait Islander peoples than in non-Indigenous people.[38] The most important systemic factors associated with increased risk of DR are poor glycaemic control,[38,45,49,50,52] hypertension,[38,50,52] dyslipidaemia[38,50,52] and renal impairment.[50,52] There is a possible association with alcohol and the development of diabetic retinopathy.[37]

Pregnancy is an independent risk factor for worsening of DR.[38,50,53] Progression of retinopathy occurs at approximately double the rate in pregnant women compared with non-pregnant women and is a leading cause of blindness in women who have pre-existing diabetes during their childbearing years.[53]

Current Australian recommendations are that all Aboriginal and Torres Strait Islander people with diabetes have visual acuity and retinal assessment (by dilated fundus examination or retinal photography) at the diagnosis of diabetes, and then yearly.[47,50,54] Establishing an effective referral process for those with retinopathy is important. People with diabetes may have refractive error and are at increased risk of developing cataract. Screening and referral pathways for these conditions are also important in providing appropriate eye care for those with diabetes.

Regular follow-up with early detection and timely treatment of vision-threatening retinopathy enables the prevention of up to 98% of visual loss.[50–52,55] Those at high risk (poor glycaemic control, hypertension, dyslipidaemia and longer duration of diabetes), should be screened annually.[47,50,54,56] Screening for children with diabetes should begin at puberty unless clinical concerns become apparent before this.[47,50,54] Mydriatic or non-mydriatic retinal photography screening has been shown to be an effective alternative to dilated fundus examination[50,57–59] and is being used routinely in some isolated areas of Australia with support through telemedicine.[54] A new MBS item number for assessment of visual acuity and retinal photography with a non-mydriatic retinal camera for Aboriginal and Torres Strait Islander people with diabetes for use in general practice became available in November 2016 (MBS item 12325; refer to 'Resources').[25,54]

Good glycaemic,[38,47,50,52,60–64] lipid[52,62,63] and blood pressure[38,47,50,52,61–63] control, together with regular eye examinations and early treatment of any diabetic retinopathy, remain the cornerstone of primary prevention and delay of progression of diabetic retinopathy.[47,50,63,65] These measures also increase the length of life, so do not reduce the lifetime risk of developing retinopathy.

Once DR is detected, further examinations by an optometrist or ophthalmologist should be conducted annually or at three-monthly to 12-monthly intervals, depending on the level of DR. Any new visual symptoms should prompt consideration of specialist referral.[47,50] Urgent ophthalmology referral (within four weeks) is recommended if any of the following are suspected: diabetic macular oedema (DME), proliferative diabetic retinopathy (PDR) or an unexplained fall in visual acuity.[50]

For women with pre-existing diabetes who become pregnant, a first trimester eye examination, either by dilated fundus examination or retinal digital imaging, is recommended.[50,52,53,66] Many guidelines also recommend preconception counselling about the risks of DR and eye examination for women with pre-existing diabetes who are planning pregnancy.[52,53,61,66] Rapid optimisation of previously poor glycaemic control in pregnancy should be deferred until after retinal assessment for women with pre-existing diabetes.[61] For pregnant women with pre-existing diabetes, retinal examinations in the second and third trimester are also recommended by most guidelines, depending on findings in earlier examinations.[50,52,53,66] Evidence indicates a need for ophthalmic follow-up for 6–12 months postpartum for women who had diabetes prior to pregnancy.[52,53,61] Women with gestational diabetes do not require screening because their risk of diabetic retinopathy does not increase during pregnancy.[52]

Recommendations: Visual acuity

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	Infants	Conduct a general eye examination. Refer to an ophthalmologist if the red reflex is absent or any other abnormality is found	Before three months of age and again between three and six months of age	GPP	15–17
	Children aged 3–5 years	Screen for visual acuity Refer if visual acuity is less than 6/9 in either eye for a three-year-old and 6/9 or less in either eye for a 4–6-year-old	As part of a routine health assessment at or before school entry	GPP	15–17, 67
	All age groups	Ask about vision. Complete an eye examination and test visual acuity if any problems are identified. Include testing for near visual acuity from age 40 onwards. Refer to an optometrist and/or ophthalmologist if problems are identified	Every 1–2 years as part of a routine health assessment	GPP	7, 19, 20
	People with diabetes	Undertake visual acuity and retinal assessment by a trained assessor This includes the use of retinal photography by trained primary healthcare staff combined with external review by an ophthalmologist	Yearly	IA IA	50 57–59
	Pregnant women with pre-existing diabetes	Conduct an eye examination and counsel clients about the risks of diabetic retinopathy (DR)	Prior to conception	III–2B	52, 53, 61, 66
		Conduct an eye examination by dilated fundus examination or retinal digital imaging	In the first trimester	III–2B	50, 52, 53, 66
		The need for further retinal examinations should be guided by results of earlier examinations	In the second and third trimesters	IV	50, 52, 53, 66
		Provide ongoing ophthalmic follow-up in the post-partum period	For 6–12 months postpartum	III–2B	52, 53, 61
Behavioural	People who currently smoke	Advise smoking cessation to reduce the risk of developing cataracts (refer to Chapter 1: Lifestyle, 'Smoking')	Opportunistic	IIIC	38
	All people	Recommend reduced ocular exposure to ultraviolet B light to reduce risk of cataract (eg wearing a hat and sunglasses when outdoors)	Opportunistic	IIIC	38, 68, 69
	All people	Recommend a balanced diet high in fruit and vegetables to reduce the risk of developing cataract and age-related macular degeneration	Opportunistic	IIB	37

Trachoma and trichiasis

Background

Trachoma is a bacterial eye disease associated with socioeconomic factors including overcrowding and poor community hygiene.[70] Classification of trachoma is via the World Health Organization (WHO) simplified trachoma grading system. Active trachoma (defined as trachoma follicular and/or trachoma inflammation) predominantly affects young children, and is a contagious infection of the eye by specific, non-genital strains of the bacteria *Chlamydia trachomatis*. Multiple infections cause conjunctival scarring (trachomatous scarring) leading to eyelid contraction and in-turned margin (entropion) over decades (trachomatous trichiasis). The resulting in-turned eyelashes rub on the eyeball, causing painful corneal scarring and corneal opacity. It is estimated that some 150 to 200 episodes of reinfection may be necessary to lead to blindness.[71] As most of this transmission occurs in childhood, children may be reinfected several times a month.

Trachomatous trichiasis is defined as at least one eyelash rubbing on the eyeball, or there is evidence of recently removed eyelashes because of eyelash in-turning.[72] If not treated with surgery to the eyelid to correct in-turned eyelashes, corneal scarring can end in blindness in later adult life. This can occur 20–40 years after the initial trachoma infections. Trachoma is the leading infectious cause of blindness, with blinding trachoma the result of a complex interaction between the actual infection and immune response.[70]

Australia is the only high-income country in the world that still has pockets of endemic trachoma and trichiasis.[73] This occurs almost exclusively in remote Aboriginal communities in the NT, South Australia and Western Australia. Trachoma is classified as endemic if >5% of children aged 5–9 years have active trachoma or >0.2% of adults or 0.1% of the whole population has trichiasis.[74] The prevalence of active trachoma in children in the endemic areas has fallen from 21% in 2008 to 4.6% in the latest figures from 2015.[75,76] Screening and treatment for trichiasis have not been reported in a systematic way in most Australian control programs,[34] but with the advent of a National Trachoma Surveillance and Reporting Unit this is improving.[77] In the communities screened in 2015 as a part of the National Trachoma Surveillance, the prevalence of trichiasis was 0.5% in adults aged >15 years, and 0.9% in adults aged >40 years; however, it is suspected that screening coverage in this age group was low.[78]

In Australia, community-wide screening occurs in communities that are identified as at risk. At-risk communities are identified by prevalence of active trachoma of >5% in Aboriginal and Torres Strait Islander children aged 5–9 years in the last five years; or current data showing <5% prevalence but >5% prevalence recorded in the last five years; or, where no data are available, historical evidence of endemic trachoma.[74]

Evidence of the effectiveness of preventive interventions

SAFE strategy

Australia is committed to the Alliance for Global Elimination of Trachoma by 2020 (GET2020), and as a result has developed guidelines for management of trachoma. The Communicable Diseases Network Australia *Guidelines for the public health management of trachoma in Australia,* 2014,[74] are based on the WHO SAFE strategy.[70,74] The acronym SAFE encompasses an integrated approach to prevention, including **S**urgery for trichiasis and entropion; **A**ntibiotics to reduce community levels of chlamydial infection; **F**acial cleanliness for children; and **E**nvironmental measures to reduce trachoma transmission. There is good evidence to support all SAFE strategy components.[74] Chlamydia vaccine development has been flagged as a possible complementary strategy to SAFE, but is currently many years away.[79]

Facial cleanliness

Facial cleanliness has been found to be linked with lower incidence of trachoma.[70] Chlamydial infection is transmitted by sharing infected ocular and nasal secretions, so that every child with a dirty face is ‘a health hazard’. A clean face is defined as a face without dried ocular and nasal discharge. With the event of Australia’s commitment to GET2020, there have been health promotion initiatives in numerous remote communities to promote facial hygiene. Data from 2010 to 2015 indicates that the prevalence of facial hygiene is improving.[80]

Facial cleanliness can be promoted by a variety of methods, including by combining it with other hygiene practices such as nose blowing, hand hygiene and brushing teeth, and also by installation of mirrors so that children can see whether their face is clean.[74] Facial cleanliness is not possible in the absence of functioning plumbing and washing facilities. Initial assessment of housing in 132 Aboriginal communities across Australia from January 1999 to November 2006 found that only 35% of households had a functioning shower.[81] The Housing for Health project, a continuation of this assessment, has resulted in significant improvements in surveyed Aboriginal communities, resulting in a significant decline of the rates of trachoma in these communities.[82–84] The Housing for Health project involved reviewing the housing hardware in certain communities using predetermined 'healthy living practices', reviewing this regularly and providing maintenance. Further detail can be found at Housing for Health (refer to 'Resources').[82,83]

Environmental strategies

Although flies, fingers and fomites are purported to be the three primary ways that trachoma is transmitted, the key is the transmission of infected ocular and nasal secretions from one child to another.[85] As a result, environmental strategies, such as improved water access and safe and functional washing facilities or bathrooms, and reduced household overcrowding, play a key role in trachoma control.[1,84,86]

Within communities, trachoma is strongly clustered by households;[32] and within households, clustered by sleeping rooms.[33] This suggests continued transmission depends on close, prolonged contact. Close contact results in infected facial secretions spreading between people rapidly, allowing for the spread of *Chlamydia trachomatis*.[87]

Sanitation, as previously stated, is important in that it allows for facial cleanliness. Good sanitation also allows for the appropriate disposal of waste, preventing the build-up of flies.[87] Although the provision of pit latrines has received much attention in African areas, subsequent work has shown that these have had little impact because most transmission occurs by the direct sharing of infected secretions.[88,89] Access to appropriate laundry facilities prevents the spread of fomites via bedding and clothing.[87] The Housing for Health project found that only 29% of assessed households had a laundry with services working, and 59% had a working toilet; with the project's input into these communities, this has improved to 71% and 91% respectively.[83]

Australian studies have so far shown that fly population control and dust control have limited impact on the prevalence of trachoma;[90,91] however, the long-term impact of such studies is unknown.[92] Flies are believed to act as mechanical vectors, spreading nasal and eye secretions,[93,94] with a review of studies largely performed overseas showing that measures to reduce fly populations by environmental improvements are associated with reductions in the rates of trachoma.[95] Dust has also been implicated as a risk factor for trachoma.[84,90] It is believed that dust causes eye irritation, resulting in rubbing eyes with fingers, discharge and inflammation.[84] Dust control involves sealing roads, building of mounds and landscaping measures to protect from wind.[84,90] However, as previously stated, in Australia the main emphasis should be on clean faces and access to safe and functional washing facilities.

Population mobility

With household spread and high mobility of families in remote areas, trachoma control and prevention may be better undertaken at a regional level with coordination of screening and mass treatment.[74] In Australia, the transient migration of many members of remote communities may contribute to ongoing trachoma endemicity. Primary health practitioners have an important role in partnering with regional population health units to implement these programs, and they can be linked to other child health screening assessments (eg anaemia and nutrition assessments).

Interventions

The diagnosis of trachoma is based on clinical grounds (refer to 'Resources': WHO trachoma grading card; University of Melbourne, Indigenous Eye Health online resources and training). The '3Ts' need to be remembered for the trichiasis examination: **T**hink to do it, use a **T**humb to lift the lid so the lashes lift away from the eye, and use a **T**orch to provide enough light to see the dark lashes.

Laboratory tests to confirm trachoma infection are currently not recommended except perhaps to exclude other viral or bacterial infection.[96] Although laboratory tests are improving, their cost and timeliness in

providing a result remain significant impediments to routine use for trachoma screening.[70] As a result, although clinical signs often persist beyond active infection, clinical examination remains the recommended tool for diagnosis.[70]

There is no evidence that opportunistic examination and treatment for trachoma in individual children improves community trachoma outcomes, but it may relieve symptoms or prompt/inform discussions about the need for treatment of households and mass treatment programs. If treatment is provided, it should be given to all people living in the same house(s) as the affected child.

The 2014 *CDNA national guidelines for public health management of trachoma* suggest that treatment of cases should be dependent on screening outcomes.[74] Screening is recommended for Aboriginal and Torres Strait Islander children aged 5–9 years who are residents of the community based on school enrolments, child health nurse records and other sources. Treatment strategy is determined by the prevalence of active trachoma cases within the community at time of screening, and may involve treating all household contacts or mass treatment of the whole community. There may be a requirement for repeat treatments on an annual basis depending on the disease prevalence in the community.[74] Should a spontaneous case be detected outside of community-wide screening, the index case and their household require treatment.[74] There is strong evidence to support community-wide treatment/mass drug administration in reducing the prevalence of trachoma.[97,98]

The decision to screen and treat individuals and their contacts should, therefore, be based on patient origin from endemic area, age and symptoms, as well as liaison with regional trachoma control programs. Discussion with regional trachoma programs will help in determining the frequency and extent of screening, as well as treatment regime.[74]

Aboriginal and Torres Strait Islander adults aged >40 years and who are current or past residents of remote communities should be screened annually for evidence of trichiasis as part of the MBS item 715 health check. This can be done by the primary care provider as part of an annual health assessment, and need not be part of community-based programs.[74] All cases of trichiasis identified on screening or opportunistically should be referred for ophthalmological assessment.[74] Blindness due to trichiasis is irreversible once it has occurred, but progression to blindness can be halted by surgery because it stops eyelash rubbing and therefore prevents corneal opacity.[99] Surgery, however, does not necessarily stop further progression of trichiasis. Therefore, post-surgery, patients should be followed up annually to screen for recurrence.[38] Other trichiasis complications such as dry eyes need symptomatic treatment to prevent further complications.

Although not a notifiable disease, data from screening should be de-identified and passed onto the National Trachoma Surveillance and Reporting Unit by nationally agreed procedures.[74]

Recommendations: Trachoma and trichiasis

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	People living where trachoma is endemic (>5% prevalence of active trachoma in young children or >0.1% of the population have trichiasis)	Implement a community screening program in partnership with regional population health units to assess the population prevalence of active trachoma Ongoing community screening is not required once prevalence is below 5% in children aged 5–9 years for five consecutive years	As per national guideline recommendations (refer to 'Resources')	GPP	74
	Adults aged >40 years raised in trachoma-endemic area	Perform eye examination to ascertain corneal scarring and/or the presence of trichiasis*	Two-yearly age 40–54 years, yearly age ≥55 years	GPP	74, 100, 101
		For those identified to have trichiasis, refer to an ophthalmologist for surgery		IIIB	38, 102

Recommendations: Trachoma and trichiasis					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	All children from trachoma-endemic areas	Recommend to families the importance of the following in the prevention and control of trachoma: • facial cleanliness of children • safe and functional washing facilities at home, in childcare and at school • regular screening, and treatment of infection	Opportunistic and as part of an annual child health check	IIB	
Chemo-prophylaxis	People living where trachoma is endemic (>5% prevalence of active trachoma in young children)	Treat case and all household contacts, discuss with regional trachoma control program to plan and deliver treatment to community, depending on community prevalence/cluster pattern Treat children who have been opportunistically found to have evidence of active trachoma infection and treat all household contacts	As per state and territory protocols	IA	74, 103
Environmental	All people	Assess the safety and functionality of the bathroom and washing facilities, and the housing situation for overcrowding, and refer to social support services for housing assistance if indicated (refer to Chapter 7: Hearing loss)		GPP	74
	Remote communities	Implement joint health promotion strategies with state/territory government public health units and local shire councils for maintaining functional washing facilities and other environmental health standards	As per state/ territory government plans	GPP	74

*Trichiasis is diagnosed when at least one eyelash rubs on the eyeball, or there is evidence of recently removed eyelashes because of eyelash in-turning.[72]

Resources

- Australian Indigenous HealthInfoNet, Eye health resources, www.healthinfonet.ecu.edu.au/other-health-conditions/eye/resources
- Australian Institute of Health and Welfare, *Indigenous eye health measures 2016*, www.aihw.gov.au/reports/indigenous-australians/indigenous-eye-health-measures-2016
- Centre for Eye Research Australia (CERA), Melbourne School of Population and Global Health, University of Melbourne, *National Indigenous Eye Health Survey: Minum barreng (Tracking eyes) – Full report*, http://mspgh.unimelb.edu.au/__data/assets/pdf_file/0004/1984144/niehs_full_report.pdf

- Communicable Diseases Network Australia (CDNA), *CDNA Guidelines for the public health management of trachoma in Australia*, www.health.gov.au/internet/main/publishing.nsf/Content/D02F0C1C2AB90509CA257C66001C089C/$File/Trachoma-SoNG.pdf
- Department of Health, MBS Online, Medicare Benefits Schedule – Item 715: Aboriginal and Torres Strait Islander peoples health assessment, www9.health.gov.au/mbs/search.cfm?q=715&Submit=&sopt=I
- Department of Health, MBS Online, Medicare Benefits Schedule – Item 12325: Aboriginal and Torres Strait Islander peoples assessment of visual acuity and bilateral retinal photography with a non-mydriatic retinal camera, www9.health.gov.au/mbs/fullDisplay.cfm?type=item&q=12325&qt=item&criteria=diabetic%20retinopathy#assocNotes
- Housing for Health, *Housing for Health: The guide*, Information about the links between health and the living environment, www.housingforhealth.com
- Indigenous Eye Health, Melbourne School of Population and Global Health, University of Melbourne, http://mspgh.unimelb.edu.au/centres-institutes/centre-for-health-equity/research-group/indigenous-eye-health#about
- Indigenous Eye Health, Melbourne School of Population and Global Health, University of Melbourne, *Check today, see tomorrow* resource kit, http://mspgh.unimelb.edu.au/centres-institutes/centre-for-health-equity/research-group/indigenous-eye-health/diabetes-eye-care/overview#resource-kit
- Indigenous Eye Health, Melbourne School of Population and Global Health, University of Melbourne, *Diabetes eye health: A guide for health professionals*, http://mspgh.unimelb.edu.au/__data/assets/pdf_file/0005/2209676/Diabetes-eye-health.pdf
- Lions Outback Vision, *Diabetic retinopathy screening manual,* www.outbackvision.com.au/wp-content/uploads/2017/03/161212-lov.man_.002-diabetic-retinopathy-screening-manual.pdf
- National Health and Medical Research Council (NHMRC), *Guidelines for the management of diabetic retinopathy*, www.nhmrc.gov.au/_files_nhmrc/file/publications/synopses/di15.pdf
- Vision 2020, Our work, www.vision2020australia.org.au/our-work
- World Health Organization (WHO), Trachoma grading card, showing simplified trachoma grading system; includes high-quality clinical pictures of trachoma and trichiasis, www.who.int/blindness/publications/trachoma_english.jpg
- World Health Organization (WHO), Trachoma, Information on the global initiative to eradicate trachoma, www.who.int/trachoma/en

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Chapter 7: Hearing loss

Background

The National Guide provides recommendations on the primary prevention of otitis media and the early detection of hearing loss, including otitis media–associated hearing loss, predominantly for children under 15 years of age, with some additional recommendations pertaining to Aboriginal and Torres Strait Islander adults. The diagnosis and management of otitis media as a strategy for preventing hearing loss and associated educational and social disadvantage is outside the scope of this guide, as other sources of advice are available.[1,2] Brief recommendations for secondary and tertiary hearing loss prevention strategies are included.

Definitions:

- otitis media with effusion (OME) – intact and non-bulging tympanic membrane (TM) and type B tympanogram
- acute otitis media without perforation (AOMwoP) – any bulging of the TM and type B tympanogram
- acute otitis media with perforation (AOMwiP) – middle ear discharge observed and TM perforation recently healed, or present for less than two weeks, or covering less than 2% of the pars tensa of the TM or too small to be readily seen; type B tympanogram
- dry perforation – TM perforation without any discharge observed; type B tympanogram
- chronic suppurative otitis media (CSOM) – middle ear discharge observed and perforation present for longer than two weeks and covering at least 2% of the pars tensa of the TM, or readily seen; type B tympanogram.

Where duration of discharge was not known, size of perforation is used to distinguish AOMwiP and CSOM. Recurrent acute otitis media (AOM) refers to three episodes within six months, or four episodes within 12 months.

A prevalence of >1% of CSOM in children in a defined community indicates that there is an avoidable burden of the disease, but which can be dealt with in the general healthcare context. A prevalence of >4% indicates a massive public health problem of CSOM that needs urgent attention in targeted populations.[3,4]

Grades of hearing loss are defined for children in Table 1.

Table 1. Grades of hearing loss as defined for children[3,4]

Grade	Hearing threshold (decibels)	Impact on function
Mild	26–30 dB	Child has trouble hearing speech, speech from a distance, or speech against a background of noise
Moderate	31–60 dB	Child has difficultly hearing regular speech, even at close distances
Severe	61–90 dB	Child may only hear very loud speech or loud sounds in the environment, such as a fire truck or siren or slamming door. Most conversational speech is not heard
Profound	>91 dB	Child may perceive loud sounds as vibrations
Disabling hearing loss: refers to hearing loss >30 dB in the better hearing ear in children		

Children

Ear infections are more common in Aboriginal and Torres Strait Islander children than in non-Indigenous Australian children, and the chronic and suppurative consequences represent a major public health problem.[5] Chronic otitis media such as OME and CSOM are highly prevalent (50% among children in rural and remote Aboriginal communities).[6] Otitis media is managed at a rate of four times for every 100 consultations in Aboriginal Community Controlled Health Services. In comparison, AOM is less commonly managed in private general practice (1.2 per 100 encounters in 2004–05), where over 98% of clients are non-Indigenous.[7] Analysis of general practitioner (GP) consultations across Australia also found otitis media was significantly more common and severe in Aboriginal and Torres Strait Islander children.[5]

An international meta-analysis of factors that increase the risk of AOM include family history of AOM, attending day-care centres and parental smoking; breastfeeding was protective.[8] In remote areas, household crowding (more than two children aged <5 years) is associated with a 2.4-fold increased risk of the youngest child having otitis media.[9]

Middle ear infections commence predominantly in very young Aboriginal infants and persist throughout early childhood,[10,11] causing hearing loss during the critical period of child development, with some effects on auditory processing and communication skills that may be lifelong[12] and difficult to correct.[13] Among over 1000 Aboriginal children aged <8 years living in urban and rural settings, otitis media (in any form) was identified in 37% of children, perforation in 2% and hearing loss in 10%. Speech skills were not age-appropriate, and receptive and expressive language was impaired in approximately 40% of children, and 27% had concurrent receptive and expressive language impairments.[14] In remote communities, the prevalence and severity of otitis media are much higher (up to 20% of children aged <3 years have perforation, 90% have some form of otitis media[6]), but there are no data published on the prevalence of speech and language impairment.

Other guidelines

The National Guide has cross-referenced recommendations in this chapter with forthcoming 2017 updates to the current evidence-based *Recommendations for clinical care guidelines on the management of otitis media in Aboriginal and Torres Strait Islander populations*.[2]

Adults

Few recent studies have examined the extent of hearing impairment in Aboriginal and Torres Strait Islander adults. Overall, self-reported rates of hearing problems/ear diseases were 12% (across all ages) in the National Aboriginal and Torres Strait Islander Health Survey (2012–13), and were higher across all age groups <55 years than reported by non-Indigenous people (rate ratio 1.3).[15] A 2006 cross-sectional analysis of at least 50% of the adult Aboriginal prisoner population in Victoria showed no difference in the prevalence of conductive hearing impairment between Aboriginal prisoners and a UK age-matched cohort (6.3% compared to 6.8% adults in the age group 18–40 years, respectively).[16] In contrast, among Aboriginal and Torres Strait Islander prisoners in one Northern Territory site who volunteered to have a hearing assessment, 22% had hearing loss of ≥35 decibels (dB) (Australian Hearing, presentation at Roundtable on Ear Health For Life, Royal Australian College of Surgeons, Canberra, November 2016). At another prison, over 90% had hearing loss ≥25 dB, of whom 35% had hearing loss ≥35 dB[17] (personal communication, Dr Damien Howard).

Other guidelines

The ninth edition of The Royal Australian College of General Practitioners' (RACGP's) *Guidelines for preventive activities in general practice* (Red Book) recommends annual questioning about hearing impairment for Australians aged ≥65 years (grade B recommendation).[18] The US Preventive Services Task Force (USPSTF) review[19] and recommendation statement[20] concluded that there was insufficient evidence to ascertain the balance of benefits and harms of screening and treatment for hearing loss in older adults (>50 years) and recommended more research.[20]

Interventions

Immunisation

Antenatal and childhood infections

Congenital and acquired hearing loss can be prevented by immunisation (rubella, measles, *Haemophilus influenzae* type b [Hib], pneumococcus, meningococcus) in accordance with the National Immunisation Program Schedule (NIPS; and variations within states and territories) from birth/infancy.[21,22] Refer to Chapter 3: Child health regarding recommendations to enhance immunisation coverage. In Australia, infection rates with measles and rubella remain extremely low and no cases of congenital rubella have been identified in the Aboriginal population for many years. The risk of congenital rubella remains, especially in immigrants.[23] Rates of congenital syphilis in the Aboriginal population are extremely low but still occur. Fewer than 10 cases of congenital syphilis have been diagnosed annually since 2007.[24] It is unclear what proportion have congenital hearing loss as a consequence. Antenatal screening is a key part of prevention of the disease (refer to Chapter 2: Antenatal care).

Pneumococcal

Pneumococcal conjugate vaccine (PCV) given to children will prevent a proportion from developing AOM, but the primary indication for the current 13-valent PCV (13vPCV) in the NIPS is for the prevention of invasive pneumococcal disease and pneumonia.[22,25] A licensed 10-valent PCV (10vPCV) also includes potential protection from AOM caused by non-typeable *H. influenzae* (NTHi) but is not currently Therapeutic Goods Administration (TGA) licenced for NTHi otitis media.

A Cochrane systematic review of randomised controlled trials (RCTs) for the prevention of otitis media using 7-valent PCV (7vPCV) (with CRM197-mutated diphtheria toxin carrier protein) showed marginal (7%) reduction in all-cause AOM, but may mean 'substantial reductions from a public health perspective'.[26] Administering 7vPCV in high-risk infants after early infancy and in older children with a history of AOM had no benefit in preventing further episodes. The review did not include more recent higher valency PCVs. Observational studies show 20% reduced outpatient visits for acute and chronic otitis media in children aged <2 years from 7vPCV.[27] Other birth cohort comparisons[28] and RCTs[29,30] show reduced incidence of recurrent otitis media and pressure-equalising tube insertions from 7vPCV. In contrast, maternal vaccination or booster doses of 23-valent pneumococcal polysaccharide vaccine (23vPPV) have not been shown to prevent otitis media in Australian Aboriginal and Torres Strait Islander children.[31,32]

In the US, 13vPCV was approved by the Food and Drug Administration in 2010 for the prevention of invasive pneumococcal disease as well as otitis media caused by the seven serotypes also covered by 7vPCV; however, 'no efficacy data for prevention of otitis media are available for the six additional serotypes'.[33] Observational studies show that the incidence rate ratio comparing pre-7vPCV to the 13vPCV period was 0.12 for five additional 13vPCV serotypes.[34]

Protein D (*H. influenzae* derived) conjugated pneumococcal vaccine (11-valent) had 34% efficacy in reducing AOM due to action against AOM from both vaccine-type pneumococcus (53%) and NTHi (35%).[35] An RCT of the final formulation (10-valent pneumococcal *H. influenzae* protein D conjugated vaccine, PHiD-CV10 or Synflorix®) had efficacy of 6% against all-cause AOM episodes[36] in low-risk populations.

In Australia, PHiD-CV10 was TGA approved in July 2009 as an alternative to 7vPCV for the prevention of childhood pneumococcal infections (including invasive disease, pneumonia and AOM). The Advisory Committee on Prescription Medicines then approved 13vPCV in 2010 for 'active immunisation for the prevention of disease caused by *Streptococcus pneumoniae* serotypes 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F (including invasive disease, pneumonia and AOM) in infants and children from 6 weeks up to 5 years of age'.[37] This indication was approved by the TGA in May 2010, and announced by the federal Minister for Health in February 2011. It took effect from 1 April 2011 in the Pharmaceutical Benefits Scheme (PBS). Neither vaccine is TGA approved for the prevention of otitis media due to NTHi.

Surveillance in the Northern Territory where PHiD-CV10 was used for two years suggests a beneficial effect of around 27% reduced NTHi-associated AOM compared to either 7vPCV or 13vPCV.[6,9,38] Higher quality studies are underway to confirm this.[39]

Influenza

Influenza vaccination in children will prevent a proportion from developing AOM but is not the primary reason for recommending it. A Cochrane systematic review of influenza versus placebo or no treatment in infants and children aged <6 years found a small 20% reduction in at least one episode of AOM over six months of follow-up.[40] Two trials reported a 30% reduction in the use of antibiotics.[40] The NIPS recommends influenza vaccine for the prevention of influenza and its complications.[22] Only quadrivalent vaccines are available in 2017[21] and are funded on the National Immunisation Program (NIP) in 2017 for Aboriginal or Torres Strait Islander people aged six months to <5 years and ≥15 years, and pregnant women (during any stage of pregnancy).[21]

The use of influenza vaccine for the prevention of otitis media is not subsidised under the NIPS.

Screening

Newborn

Because 50% of children with hearing loss have no identifiable risk factors, universal screening (instead of targeted screening of high-risk groups) has been proposed to detect children with permanent congenital hearing loss (PCHL) early in life.[41] PCHL occurs in one to two infants per 1000 births, significantly higher than prevalence of other conditions for which newborn screening currently occurs. Newborn hearing screening leads to earlier identification and intervention, and ultimately leads to better language development.[42] In the absence of newborn hearing screening, three out of four children with PCHL remain undiagnosed by 12 months of age and their capacity for normal language and cognitive development is greatly diminished. Neonatal hearing screening is believed to have resulted in significant cost savings to the health system.[43] In 2011, it was reported that more than 95% of all newborns in Western Australia had received neonatal hearing screening.[44] A systematic review identified educational disparity and lack of adequate knowledge of parents to be associated with loss to follow-up.[45]

Several systematic reviews have examined universal newborn hearing screening. The USPSTF recommends screening for hearing loss in all newborn infants before one month of age. Infants who do not pass the newborn screening should undergo audiology and medical evaluation before three months of age. Those with risk factors continue periodic testing for three years.[46] This is based on good quality evidence that early detection improves language outcomes,[42] although the net benefit (taking account of risk of harms such as parental stress from false positives/negatives and bacterial meningitis post-Cochlear implant) is more moderate.[45] The number needed to screen to diagnose one case is 878 for universal newborn hearing screening and 178 for targeted screening programs.[46]

A systematic review found that patient-relevant parameters, such as social aspects, quality of life, and educational development, have not been adequately investigated, thereby limiting understanding of the impact of newborn hearing screening.[47] Cost effectiveness in the long term has been difficult to determine due to lack of certainty about the benefits gained from early detection and treatment. Alternative approaches to screening were not available to establish whether universal newborn screening is a good long-term investment.[48]

Early childhood

The USPSTF recommends periodic testing for three years in children at risk.[42] The American Academy of Pediatrics has released screening recommendations for assessing hearing loss in children at all ages, and definitive hearing testing at intervals in those children with risk factors (eg recurrent or chronic otitis media). No specific reference is made to school screening.[49] School-entry screening might pick up undetected deafness (usually OME) warranting personal intervention, but it is unclear if this outcome justifies school-entry screening, particularly because hearing loss can fluctuate. Screening for OME in non-Aboriginal children is not recommended by general guidelines.[18]

Specific recommendations for the Aboriginal and Torres Strait Islander population for hearing surveillance from early childhood are related to the high incidence and prevalence of otitis media in this population. Screening school children in Perth identified 19% (18/94) of Aboriginal children (1998–2004) had unilateral/bilateral mild–moderate hearing loss.[50] There was no cohort or comparison group of non-Aboriginal children,

so it is not possible to assess the significance of this level. This is the only recent school screening report in Australia. However, according to the Darwin Otitis Guideline Group, in regions with near universal early and persistent conductive hearing loss due to infection (intermittent/recurrent), it is unlikely that hearing screening at school entry will reveal information that is not already known.[2] The Darwin Otitis Guideline Group recommend that regular surveillance (with appropriate testing when indicated) throughout early childhood is preferred to school-entry screening.

Behavioural

Parental and community vigilance for the detection of hearing loss in children is crucial. However, studies report parental perception of a hearing abnormality is a very poor predictor of hearing loss from OME, even after tympanostomy tube insertion.[51,52] In the UK, a study reported in 1990 found that approximately only one in five children affected by mild to moderate hearing loss had their loss identified and initiated by parental suspicion. [53] Parental suspicion was only slightly higher (one in four) for severe or profound hearing loss.[53] Other sources of identification include well-baby checks (20%) and through risk factors (intensive care admission in the newborn period; small for gestational age; ear, head or throat anomalies; familial hearing loss) (31%).[54] In remote Northern Territory Aboriginal communities, unpublished data from a birth cohort study[39] shows that no parent initiated a request for a hearing test in their children aged <3 years, yet almost all those tested had hearing loss (25–50 dB).

While 90% of infants with congenital cytomegalovirus (CMV) infection display no manifestations at birth, the remaining 10% do have signs and are at risk of life-long neurological consequences, including cognitive and motor deficits, hearing and visual impairments. There is currently no licensed vaccine against CMV. There are insufficient data to assess whether any interventions for pregnant women with confirmed primary CMV infection make a difference in the prevention of congenital CMV infection and its sequelae or the occurrence of adverse events as a result of an intervention.[55] Maternal education and behavioural modification are used to limit women acquiring CMV in pregnancy (eg by improved hand hygiene for them and young children who are the predominant asymptomatic carriers of CMV [Box 4]).[56]

Breastfeeding

A meta-analysis of observational studies found that any form of breastfeeding was protective of AOM in the first two years of life. Exclusive breastfeeding for six months was most protective and reduced the risk of AOM by almost one-half.[57]

Smoking

Although exposure to passive smoke is a confirmed risk factor for otitis media,[58–60] there is limited evidence that interventions to reduce exposure are effective.[61] One RCT in the Northern Territory and New Zealand assessed the effect of an intervention to reduce exposure to second-hand smoke during the first three months of an infant's life and found no statistically significant impact of the intervention on maternal smoking rates (70% versus 59%) or infant otitis media events.[62]

Handwashing

Handwashing with soap prevents diarrhoea and acute lower respiratory infections that cause the largest number of childhood deaths globally.[63] Handwashing with daily bathing also prevents impetigo.[63] Regarding the prevention of transmission of pathogens that cause AOM, poor handwashing was a predictor of NTHi throat carriage in children from day-care centres.[64] The risk of pneumococcal or NTHi hand contamination was eight and nine times higher, respectively, in Aboriginal children aged 3–7 years from a remote community compared to non-Aboriginal children aged <4 years from urban day-care centres, further supporting the important role of handwashing in the prevention of otitis media.[65]

Few high-quality studies have evaluated the effects of handwashing, nose-blowing and facial cleanliness on the prevention of AOM. A Central Australian community-based school program of daily nose-blowing, deep breathing and coughing found respiratory improvements, but no change in hearing, following a five-month

period.[66] Community preference for this program,[67] 'infomercials' on community television[68] and application of evidence studies[65,69–72] have led to ongoing modifications to the program (including nose emptying, hand and face washing, use of soap, and drying with paper towels) that should be evaluated.

An RCT examining handwashing in child day-care centres found that children in the intervention group had fewer visits to a doctor because of OME and received 24% fewer prescriptions for antimicrobials. There was general compliance with the handwashing instructions.[69] An Australian cluster RCT of infection control in day-care centres found a significant reduction in respiratory illness in children aged <2 years, particularly when hygiene compliance was high.[72]

Swimming

The Norwegian Mother and Child Cohort Study (1999–2005), which followed children from birth to the age of 18 months, found that children who were baby swimming (at six months) were no more likely to have lower respiratory tract infections, to wheeze or to have otitis media.[73] A Cochrane review of water precautions (mechanical or water avoidance) for prevention of infection following tympanostomy tubes found two studies (413 patients) of low quality and concluded that an average child would have to wear earplugs for 2.8 years to prevent one episode of otorrhoea, and that avoidance of swimming made no clinically significant difference.[74]

Children with CSOM ('runny ears') have the greatest level of hearing loss. These children may benefit from swimming due to mechanical clearance of ear discharge or disinfection (ie swimming may restore hearing). Clearance of pus from the canal can improve hearing by ~5 dB or more in some 41% of children.[75] A small case series showed that tissue spears used to clear canal pus can improve hearing in the short term (within at least 30 minutes of cleaning in around 40% of children with CSOM).[75] The study did not evaluate longer term outcomes, so the duration of potential benefit is not known.

The introduction of swimming pools in two remote Aboriginal communities was associated with a reduction in the prevalence of tympanic membrane perforations over 18 months.[76] A more extensive comparison in Central Australia, however, found no benefit of pools for ear disease.[77] Similarly, a small RCT in the Northern Territory found no difference in ear discharge, perforation size or microbiology for children with CSOM who were randomised to swimming after school compared to those randomised to other activities.[78] A systematic review of these and other swimming studies found no evidence for a benefit of swimming pools for ear health.[79]

Surgical

Tympanostomy tubes (TTs) or grommets are inserted in children's ears to restore hearing loss caused by OME or prevent recurrent AOM (refer below). Adenoidectomy may further improve outcomes of TTs.[80,81] Surgeons may be reluctant to insert grommets in the ears of young Aboriginal and Torres Strait Islander children (aged <10 years) because of the risk of TT otorrhoea, CSOM and ultimately a higher level of hearing loss. A current trial is looking into the risks of TT otorrhoea in Aboriginal and Torres Strait Islander children due to surgeon variability. Children with TT otorrhoea treated with antibiotic eardrops compared to saline or no treatment have 31% to 50% more resolution of discharge at 1–2 weeks.[82] Some low-quality evidence showed that addition of corticosteroid eardrops may improve this outcome by 15%.[82]

A Cochrane systematic review found grommets were beneficial in the first six months (4 dB at 6–9 months) for hearing loss associated with OME; one study measured a 12 dB benefit at three months, another reported that otorrhoea was common in infants.[83] Another Cochrane systematic review[84] and additional RCTs [85,86] have found children with recurrent AOM who received grommets were more likely to remain free of otitis media in the 6–24 months after tube insertion than children not having surgery. Another Cochrane review addressed prophylactic interventions for prevention of otorrhoea following TT insertion.[87] Each of the following was effective at two weeks post-surgery: saline washouts at surgery, topical antibiotics/steroids at surgery, prolonged topical drops, and prolonged oral antibacterial/steroids. The benefits were greater (lower number needed to treat for a benefit) in RCTs with higher rates of otorrhoea among controls.

Chemoprophylaxis

Antibiotics

A Cochrane review of 13 RCTs found long-term (>6 weeks) prophylactic antibiotics versus no treatment or placebo in healthy but at-risk or otitis-prone children (recurrent AOM or persistent OME or in population at high risk of CSOM) can prevent (almost halve) episodes of AOM during therapy.[88] A 2016 Cochrane review of antibiotics for OME found low-quality evidence of 25% reduction in OME at 2–3 months and 20% reduction at six months;[89] limited studies reported no difference in ventilation tube insertion or hearing levels. However, an individual patient data meta-analysis showed that oral antibiotics used in AOM had a marginal non-significant effect in preventing subsequent persistent OME (duration >1 month). The authors concluded that, in view of the potential for antibiotic resistance and side effects, routine treatment of AOM to prevent OME could not be warranted.[90] Although bacterial resistance is the main concern of antimicrobial use, few trials measure or report on antimicrobial resistance. Further, there is little evidence that AOM can be prevented by commencing treatment with antibiotics at the onset of upper respiratory tract symptoms.[91]

Prophylactic antiviral drugs

It has been reported that AOM occurs in 20–50% of children aged <6 years after an influenza infection.[92] AOM was significantly reduced in patients with confirmed influenza infection treated with neuraminidase inhibitors (NIs) versus placebo.[93] Another systematic review examined the effect of antiviral drugs on the secondary effects of influenza; rates of otitis media were no different in older children, but were significantly lower in children aged <5 years.[92] A 2012 Cochrane review of NIs for preventing and treating influenza in children found that oseltamivir also significantly reduced AOM in children aged 1–5 years with laboratory-confirmed influenza (risk difference –0.14);[94] two trials reported that the number needed to harm (from medication-induced vomiting) was 17.

Other preventive strategies

Xylitol

There is moderate quality evidence from a 2016 Cochrane systematic review showing that the prophylactic administration of xylitol among healthy children attending day-care centres can reduce the occurrence of AOM.[95]

Vitamin D supplementation

Vitamin D for AOM prevention has not been evaluated in high-quality trials. One RCT of vitamin D (1000 IU/day) versus placebo in children at increased risk of AOM showed a reduction in the proportion of children in the vitamin D group experiencing one or more AOM episodes.[96]

Pacifier use

Instructions and information about reducing pacifier use was evaluated in one cluster RCT. The intervention reduced continuous pacifier use in children aged 7–18 months and reduced the occurrence of AOM per person month by 29%.[97]

Probiotics

A Cochrane 2011 systematic review concluded that probiotics were better than placebo in preventing acute upper respiratory tract infection (URTI).[98] One RCT for AOM prevention was included, which found no benefit of probiotics.[99] Another systematic review found no benefit for URTI or AOM.[100] A meta-analysis of four RCTs using the same probiotic (*Lactobacillus rhamnosus* GG) found a significant 24% reduction in the incidence of AOM.[101] An RCT of mixed probiotics versus placebo for prevention of AOM in at-risk children found no benefit over a 12-month follow-up.[102] Intranasal twice-daily *Streptococcus salivarius* 24SMB for five days per month for three months has recently been evaluated in a placebo-controlled trial in children for prevention of AOM. Compared to controls, there was a non-significant reduction in AOM in *S. salivarius* 24SMB recipients, and significantly less AOM in the subgroups of children successfully colonised by *S. salivarius* 24SMB after treatment.[103]

Zinc

A Cochrane systematic review identified mixed evidence of zinc supplementation (at least once per week for at least one month) versus placebo for preventing otitis media in healthy children aged <5 years living in low- to middle-income countries.[104]

Antihistamines, decongestants, topical/oral steroids

Neither antihistamines nor decongestants, singly or together, or topical (intranasal) steroids alone reduce the risk of OME or improve hearing and are not recommended.[105,106] Oral steroids combined with oral antibiotics compared to placebo and oral antibiotics improve OME resolution by 23% in the short term (7–28 days) but do not improve hearing by 10 dB or more at six weeks.[106]

Autoinflation

Autoinflation (balloon inflation via nose blowing) for prevention of hearing loss associated with OME was found in one Cochrane systematic review[107] and one subsequent RCT in 2015[108] to show short-term to medium-term clinical improvements (tympanometry or audiometry changes combined) and benefits for children and parents in ear-related quality of life.

Environmental interventions

Housing

Early and persistent otitis media could potentially be prevented if overcrowding in Aboriginal communities was alleviated.[59] For Aboriginal and Torres Strait Islander peoples, poor quality and overcrowded housing are key determinants of adverse health outcomes, including for ear health[109] in both urban[110] and remote regions.[111,112] More than a quarter of the Aboriginal population live in a house deemed to need extra bedrooms, compared to just 5.7% of non-Indigenous people. In some remote areas in the Northern Territory, the highest rates of overcrowding were reported, with over 70% of people living in overcrowded conditions (ie needing more bedrooms).[113] The causal relationship between housing and health remains poorly understood. Interestingly, overcrowded housing has also been shown to be associated with increased nasopharyngeal carriage of otitis media pathogens *S. pneumoniae, Moraxella catarrhalis* and NTHi in both Aboriginal and non-Aboriginal children.[114] Nasopharyngeal carriage of these pathogens is a well-established predictor of early onset AOM and chronic otitis complications.[114] In New South Wales, an Aboriginal public housing improvement program was associated with improved respiratory, skin and intestinal infections but not otitis media.[115]

Noise induced hearing loss

Few studies have explored the prevalence of noise-related hearing disorders affecting Aboriginal and Torres Strait Islander peoples. The hearing status of 109 Aboriginal prisoners in Victoria revealed that 36% had high-frequency hearing loss and that this was most consistent with a noise-induced loss. Ninety-two per cent had reported exposures to loud noise.[16] One study in the Northern Territory found that noise exposure exceeded the allowable daily exposure of 85 dB averaged over an eight-hour working day (occupational standards).[116] A significant risk of noise-induced hearing loss is believed to occur in the majority of persons exposed to levels that exceed this on a long-term basis. Overcrowding is likely to contribute to excessive noise exposure. Such exposure may create 'a "second wave" of preventable noise-induced sensori-neural hearing loss for those in Aboriginal and Torres Strait Islander communities.'[116] Few health professionals and families are aware of the fact that excessive exposure to loud noise over prolonged periods can damage hearing. In terms of interventions, Aboriginal and Torres Strait Islander health workers have an important role to play since they can best inform families about the dangers of too much loud noise, and of the particular dangers for children with a history of ear disease.[116] A recent Cochrane review reported that reduced noise exposure can be achieved with use of personal earmuffs and earplugs, with instruction.[117] Stricter legislation might reduce noise levels, and effects of hearing loss prevention programs are unclear.[117] A review of occupational noise-induced hearing loss in Australia identified the need for both regulatory enforcement and education, but found that the expense, difficulty and being low priority for employers were barriers to implementation.[118]

Recommendations: Hearing loss					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Immunisation	Children aged <15 years	Vaccination is recommended to prevent infections that may lead to congenital or acquired hearing loss (rubella, measles, *Haemophilus influenzae* type b, meningococcus) (refer to Chapter 3: Child health)	As per National Immunisation Program Schedule (NIPS) and state/ territory schedules	I–A	22
		Pneumococcal conjugate vaccination (13vPCV) is recommended during infancy to prevent invasive disease, pneumonia and acute otitis media (AOM)* (refer to Chapter 9: Respiratory health)	At age six weeks, and at age four, six and 18 months, as per NIPS	I–IIA	25, 26, 35–37
		Annual influenza vaccination (inactivated virus) is recommended for any person aged ≥6 months who wishes to reduce the likelihood of becoming ill with influenza. Vaccination may reduce the incidence of AOM as a secondary complication of influenza (refer to Chapter 9: Respiratory health)	As per NIPS and state/territory schedules	IA	21, 40
	All pregnant women	Offer testing for rubella immunity and syphilis serology to prevent infections that may lead to congenital hearing loss (refer to Chapter 2: Antenatal care) Recommend enhanced hygiene practices for cytomegalovirus (CMV) prevention (Box 4)	Refer to Chapter 2: Antenatal care		N/A
Screening	Newborn infants	Ensure parents of newborn infants are aware of the universal neonatal hearing screening program being implemented in each state and territory and have had their newborn screened for congenital hearing impairment Advise parents that infants can fail hearing tests at a subsequent age and at-risk children should be periodically tested to three years of age	Prior to age one month. If missed, prior to age three months If pass but still at high risk, periodic tests to age three years	I–B	43, 46 42, 45, 47, 48
	Children aged <15 years	Encourage parents to be aware of child developmental milestones in the early detection of hearing loss (Box 1). Parental or teacher suspicion of hearing loss should always be investigated (Box 2). Where relevant, provide advice regarding free hearing assessment†	Opportunistic, and as part of annual health check	GPP	2, 18
		Conduct ear examinations (including pneumatic otoscopy or video otoscopy and tympanometry) in order to detect unrecognised acute or chronic otitis media. If detected, refer to clinical practice guidelines for management (refer to 'Resources')	Opportunistic and as part of annual health check	GPP	2
	Children aged <5 years and older children at high risk of hearing impairment‡	Maintain a high index of suspicion of hearing loss as there is a high prevalence of undetected hearing loss and disadvantage among Aboriginal and Torres Strait Islander school-age children	Opportunistic and as part of annual health check	GPP	2, 49

Recommendations: Hearing loss					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	Children aged <5 years and older children at high risk of hearing impairment‡	Use the following audiological tools to monitor for hearing loss: simplified parental questionnaires (Box 1), and three-monthly pneumatic otoscopy or video otoscopy and tympanometry (in children aged >4 months). Note: These methods do not assess hearing Note: Pneumatic otoscopy or video otoscopy and tympanometry are used to identify otitis media and document duration (with possible conductive hearing loss). Refer to clinical practice guidelines for the identification and management of persistent otitis media with effusion (OME) or recurrent AOM§[1,2] (refer also to 'Resources'). Those with suspected hearing loss (or caregiver concerns) should be referred as per Box 2	Opportunistic and as part of regular health check	GPP	2, 18
Screening	Children at school entry	The routine hearing screening of all children upon commencement of their first year of compulsory schooling may have limited public health value and is not encouraged. Regular surveillance is preferred Advise parents that absenteeism is associated with hearing loss		GPP	2
	Adults aged >15 years	Monitor for hearing impairment by questioning, provide advice regarding free hearing assessment,† and make referrals when appropriate Hearing screening is not recommended for persons aged >50 years Inform families of increased risk of hearing loss among incarcerated people	As part of annual health check	GPP	18-20
Behavioural	Pregnant women and postnatal period	Promote exclusive breastfeeding for at least three months (and preferably to six months) to reduce the risk of infants acquiring AOM	Opportunistic, antenatal and postnatal checks, and as part of annual health check	IA	2, 57
		Refer women to breastfeeding support programs if needed		IA	57
		Advise pregnant women of risk of CMV infection, particularly when exposed to young children, and emphasise the importance of handwashing (Box 4) Advise that risk of AOM increases with use of pacifiers		IIA	55 97
	All people who smoke	Promote smoking cessation and the need to avoid children being exposed to cigarette smoke, as passive exposure increases the risk of acute, recurrent and chronic otitis media (refer to Chapter 1: Lifestyle, 'Smoking cessation') Note: Avoidance of smoke exposure has other health benefits but has not been shown to reduce exposure to or prevent respiratory infections	Opportunistic and as part of annual health check	I–A	2, 58–62

Recommendations: Hearing loss					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	All people	Swimming (sea, clean fresh water or chlorinated) should be permitted, including in children with a prior history of otitis media (all forms)	Opportunistic	IA	73
	Children with tympanostomy tubes (TTs) or chronic suppurative otitis media (CSOM)	Children with TTs may continue to swim unless there is a prior association with discharge after swimming Children with CSOM do not benefit from swimming, but swimming should not be discouraged	Opportunistic	IC	74
				III–3	76–79, 84
	All people	A video otoscope may assist in helping patients and families to understand ear disease. This may lead to greater engagement in its prevention and management	Opportunistic	GPP	2
		Inform families of the importance of frequent and thorough nose-blowing, facial cleanliness, handwashing and drying of children in order to prevent the transmission of infectious disease	Opportunistic	IB	63, 69, 70, 72 64–67, 71
		Promote frequent handwashing in day-care centres and preschools		IB	8, 65
Surgical	Children with hearing loss associated with recurrent AOM or OME	Consider referral for TTs (or grommets) to reduce hearing impairment in children with OME and increase otitis-free duration in children with recurrent AOM. Adenoidectomy may further improve outcomes Interventions at surgery (saline washouts at surgery, topical antibiotics/steroids) or after insertion of TTs (topical drops, and prolonged oral antibacterial/steroids) reduces the risk of TT otorrhoea, particularly in high-risk groups Antibiotic eardrops are effective in treating TT otorrhoea	Opportunistic	IA	83 80, 81 87 82
Chemo-prophylaxis	Children aged <15 years Children aged <2 years or bilateral AOM or AOM with perforation	The use of prophylactic antibiotics in order to prevent the onset of AOM is not recommended, except in children at risk of recurrent AOM or tympanic membrane perforation, such as those aged <2 years, with bilateral AOM or AOM with perforation, or children living in high risk populations Antibiotics for OME reduce prevalence of OME at age 2–6 months but have not been shown to improve hearing	Opportunistic	IA	88, 89
		The use of prophylactic antiviral drugs in those with confirmed influenza may also prevent the onset of AOM but neuraminidase inhibiters are not recommended as a primary reason for AOM prevention following influenza	Opportunistic	IA	59, 93
		Probiotics are not currently recommended for the prevention of AOM Note: Some probiotics may be effective in the prevention of AOM episodes in European children	Two to three times daily	ID	98–100, 102

Recommendations: Hearing loss					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	Children aged <15 years Children aged <2 years or bilateral AOM or AOM with perforation	Zinc supplementation is associated with mixed benefit for AOM prevention and is not currently recommended	One dose per week for four weeks	IC	104
		Vitamin D may reduce recurrence of AOM but is not currently recommended based on current evidence	1000 IU per day	IID	96
		Autoinflation may be an option for preventing hearing loss associated with OME in children aged >4 years	3x per day	IC	107, 108
		Antihistamines, decongestants or combination, or topical steroids for OME, are not effective in resolving OME or improving hearing and are not recommended When combined with oral antibiotics, oral steroids improve OME resolution in the short term only, and have not been shown to improve hearing at six weeks		IA	105, 106
Environmental	Children aged <15 years	Assess children at **high risk of hearing impairment**‡ with regard to their housing situation (ie if overcrowding is likely, functional condition of housing) and refer to social support services for housing assistance if indicated (Box 3)	Annual	IIIC	59, 109, 111, 112, 114
	All people	Inform families of the danger of loud noise (and for prolonged periods), especially for children with a history of ear disease (refer to 'Resources')	Opportunistic	GPP	116, 117

*Aboriginal and Torres Strait Islander children in high-risk areas are recommended to also receive 13vPCV as a 'booster dose' between 18 and 24 months of age as indicated for the prevention of invasive pneumococcal disease. High-risk areas include the Northern Territory, Queensland, South Australia and Western Australia. Booster dose of 13vPCV is not recommended for children in New South Wales, ACT, Victoria and Tasmania.[21]

†The Australian Government's Hearing Service Program[119] enables eligible Australians to receive funded rehabilitative hearing services, including hearing and communication assessment, support and fitting of amplification. There are two client service groups: Community Service Obligation (CSO) and Voucher. **Voucher client group**: a wide range of approved private providers, including Australian Hearing, provide services under the Voucher program. People who are eligible for these services include Australian citizens or permanent residents who are pensioner concession cardholders, Veterans Affairs cardholders, recipients of a Centrelink sickness allowance or a dependent of these eligibility groups; Australian Defence Force members; National Disability Insurance Scheme participants, or people who are referred by Disability Employment Services. **CSO client group**: Australian Hearing is the sole provider of services under the CSO stream. This includes children and young adults aged <26 years; Voucher-eligible adults who have complex hearing and communication needs, including greater degrees of hearing loss and additional disabilities; Aboriginal and Torres Strait Islander adults aged ≥50 years; Aboriginal and Torres Strait Islander participants in the remote area Community Development Programme; and Aboriginal and Torres Strait Islander adults who meet Voucher program eligibility criteria but who are being seen at one of Australian Hearing's Outreach locations.

‡High risk of hearing impairment: those from socioeconomically deprived communities and from regions with a high prevalence of otitis media; and individual children in any community if they have bilateral AOM or AOM with perforation, or have CSOM or AOM and are aged <2 years, or have persistent OME or recurrent AOM.

§Recurrent AOM: the occurrence of three or more episodes of AOM in a six-month period, or occurrence of four or more episodes in the last 12 months.[2]

Box 1. Hearing-related growth milestones in children[2,120,121]

Simplified parental questionnaires can elicit a child's progress through the following hearing-related growth milestones:

- **3–6 months:** not communicating by vocalising or eye gaze; not starting to babble
- **9 months:** poor feeding or oral coordination; no gestures (pointing, showing, waving); no two-part babble (eg gaga)
- **12 months:** not babbling; no babbled phrases that sound like talking
- **20 months:** only pointing or using gestures (ie not speaking); no clear words; cannot understand short requests
- **24 months:** using <50words, not following simple requests; not putting words together; most of what is said is not easily understood
- **30 months:** no two-word combinations
- **36 months:** speech difficult to understand; no simple sentences
- **48 months:** speech difficult to understand; not following directions involving two steps
- **60 months:** difficulty telling parent what is wrong; cannot answer questions in a simple conversation

Box 2. Criteria for referral of children with persistent or recurrent otitis media, suspected hearing loss, hearing-related problems elicited through simplified parental questionnaires (Box 1), and/or caregiver concerns[2]

Age of child	Referral to
<3 years	Major regional hearing centre to determine the level of loss
<5 years and older children at high risk of hearing impairment*	Paediatrician and an audiologist (for appropriate developmental assessment and hearing tests) and ear, nose and throat (ENT) specialist for surgical restoration of hearing (eg tympanostomy tubes); advise parent of strategies to improve communication, advise child's school
<15 years	Audiologist (or ENT specialist) for full hearing assessment

*High risk of hearing impairment refers to children from socioeconomically deprived communities and from regions with a high prevalence of otitis media.[8]

Box 3. Definition of overcrowded housing circumstances[113]

Households that do **not** meet these requirements are deemed to be overcrowded:

- There should be no more than two persons per bedroom
- Children aged <5 years of different sexes may reasonably share a bedroom
- Children aged ≥5 years of opposite sex should have separate bedrooms
- Children aged <18 years and the same sex may reasonably share a bedroom
- Single household members aged >18 years should have a separate bedroom, as should parents or couples

Box 4. Hygiene practices recommended by the Centers for Disease Control and Prevention to reduce risk of cytomegalovirus infection for women who are pregnant or planning to become pregnant[122]

- Thoroughly wash hands with soap and warm water after activities such as:
  - nappy changes
  - feeding or bathing young child
  - wiping child's runny nose or drool
  - handling child's toys
- Do not share food, drinks, eating utensils used by young children
- Do not put a child's dummy in your mouth
- Do not share a toothbrush with a young child
- Avoid contact with saliva when kissing a young child
- Clean toys, countertops and other surfaces that come in contact with urine or saliva

Also refer to 'Resources'

Resources

- Centers for Disease Control and Prevention, 'Cytomegalovirus (CMV) and congenital CMV infection', www.cdc.gov/cmv/overview.html
- Centers for Disease Control and Prevention, non-specific recommendations about handwashing, www.cdc.gov/handwashing/index.html
- *Recommendations for clinical care guidelines on the management of otitis media in Aboriginal and Torres Strait Islander populations*, www.health.gov.au/internet/main/publishing.nsf/Content/B8A6602C7714B46FCA257EC300837185/$File/Recommendation-for-clinical-guidelines-Otitis-Media.pdf
- Deafness Forum of Australia, 'Fact sheet: Noise destroys your hearing', www.hearingawarenessweek.org.au/images/Noise%20Destroys%20FACT%20SHEET.pdf
- Therapeutic Guidelines, eTG complete, Antibiotic, Version 14, 2010, https://tgldcdp.tg.org.au/topicTeaser?guidelinePage=Antibiotic&etgAccess=true

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Chapter 8: Oral and dental health

Background

Poor oral and dental health can affect quality of life by causing pain, infection, difficulties with speech and eating, and embarrassment about appearance. The two main dental diseases are dental caries (tooth decay) and periodontal (gum) disease. Dental caries is a localised infection and destruction of the hard tissues of the teeth that starts when organic acids cause demineralisation of tooth enamel. Dental plaque, a complex biofilm that builds up on teeth, contains bacteria that produce acids after fermenting the carbohydrates found in food and drinks. The rate of enamel destruction increases with frequent exposure to fermentable carbohydrates and poor oral hygiene.

Dental caries is considered to be a multifactorial disease, with some of the contributing factors being diet (especially high and regular consumption of sugar and carbohydrates in food and drinks such as black cola, sweetened fizzy drinks and sports drinks), inadequate exposure to fluoride, poor oral hygiene practices, and salivary composition and flow. Xerostomia or dry mouth may also contribute to dental caries development. Risk factors for xerostomia include use of certain medications including antidepressants, antihypertensives, anticoagulants, antiretrovirals, hypoglycaemics, non-steroidal anti-inflammatory drugs, and steroid inhalers; radiotherapy and chemotherapy for cancers of the head and neck; and Sjogren's syndrome.[1] Human immunodeficiency virus (HIV) infection can also contribute to a greater risk of periodontal disease, oral ulceration and cancer.

Nationally, Aboriginal and Torres Strait Islander adults have greater levels of dental caries than non-Indigenous Australians, with higher levels of untreated caries and missing teeth and lower numbers of filled teeth. For Aboriginal and Torres Strait Islander children, the rate of current or past caries in deciduous (first) teeth and adult teeth is at least two and 1.5 times greater respectively than for non-Indigenous children. Overall, caries rates are higher in rural and remote areas compared to metropolitan areas. The proportion of untreated dental caries is higher among Aboriginal and Torres Strait Islander children, which often reflects a lack of access to dental services.[2]

Important general risk factors for periodontal disease include poor oral hygiene, smoking, diabetes, hormonal imbalances, poor diet, and stress. Although data are limited, the prevalence of periodontal disease appears to be greater in Aboriginal and Torres Strait peoples compared to non-Indigenous people.[2] Treatment of pre-existing periodontal disease has demonstrated small but significant improvements in glycaemic control for people with type 2 diabetes, underscoring the importance of regular oral health assessments in this population. There is growing evidence to suggest periodontal disease may be associated with systemic conditions such as cardiovascular disease, stroke, obesity and cancer; however, causal links are yet to be proven. Holistic approaches to risk factor reduction that address smoking cessation, reduced sugar consumption and weight control are likely to confer multiple health benefits related to periodontal disease, dental caries, diabetes, heart disease and some cancers.[3]

Other major oral and dental conditions of concern are oral cancer, tooth erosion (hard tissue degradation of the teeth by acids such as those found in acidic foods and drinks, and in patients with bulimia, whose teeth are susceptible to acid attacks from frequent vomiting), and oral trauma (eg through sports injuries). Tobacco smoking and alcohol consumption are risk factors for the development of oral cancer, and the risks from these two behaviours are additive.

Interventions

Standard preventive measures against dental caries, such as twice-daily use of fluoride-containing toothpaste and minimising sugar consumption, are advised, along with referral for a professional dental check. Toothbrushing with a fluoridated toothpaste cleans the teeth and removes food particles, while the fluoride works to strengthen the enamel against demineralisation by bacteria-related acids. Drinking fluoridated water is also effective in preventing enamel demineralisation.

Fluoride varnish is a resin paste with a high fluoride concentration (5% sodium fluoride, 22,500 F parts per million [ppm]), which, when applied six-monthly over at least two years, is effective in preventing tooth decay.[4,5] It is applied as a thin coating to the tooth surface that provides a highly concentrated, temporary dose of fluoride to the tooth. Medical general practitioners participating in early childhood programs have been trained to apply the fluoride varnish in coordination with the dental team.

Since dental caries is considered to be a bacterial infection, the improvement in oral health of a pregnant woman can lower the risk of transmitting harmful oral bacteria to a newborn.[6] During pregnancy there may also be a greater risk of tooth erosion from nausea and vomiting, and progression of periodontal disease. The use of fluoride supplements is not recommended in pregnancy as there is no evidence of effectiveness.

Twice-daily toothbrushing with a fluoridated toothpaste and attention to diet, along with other interventions as recommended by dental practitioners such as dental flossing, are also recommended for people at risk of periodontal disease.

Guidelines on prevention of infective endocarditis recommend antibiotic prophylaxis prior to specific dental procedures in Aboriginal and Torres Strait Islander people with rheumatic heart disease,[7] in addition to general recommendations for all people with prosthetic valves, previous infective endocarditis, certain congenital heart conditions and cardiac transplantation. Maintenance of good oral health, combined with six-monthly checks and oral hygiene guidance, are advised to reduce the risk of infective endocarditis.[7]

Recommendations: Oral and dental health

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	Children aged 0–5 years	Undertake an oral health review including the assessment of teeth, gums and oral mucosa, as part of a regular health check (Box 1)	Opportunistic and as part of an annual health check	GPP	8
	People aged 6–18 years		Annually	GPP	9
	Adults with poor oral health and/or risk factors for dental disease (Box 2) People with diabetes, immunosuppression, haematological conditions, bleeding disorders or anticoagulant therapy		Annually	GPP	9
	All pregnant women		At first antenatal visit (refer to Chapter 2: Antenatal care)	GPP	8
	Adults with good oral health		Two-yearly	GPP	9
	Those with past history of rheumatic heart disease and cardiovascular abnormalities	Undertake an oral health review as part of a regular health check (Box 1) and offer appropriate oral hygiene advice to minimise oral bacterial levels	Six-monthly	GPP	7

Recommendations: Oral and dental health					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	Children aged 0–5 years	Recommend use of fluoride-containing toothpaste at least once daily, from the time the teeth start to erupt*	Opportunistic	IA	8, 10
	Children aged 0–5 years where families have evidence of dental caries and/or poor oral hygiene	Application of fluoride varnish from the age of two years, by dental team or trained GP where appropriate	At least every six months and for a period of not less than 24 months	IB	4, 5, 10
	People aged >5 years at high risk of dental caries (Box 2)	If resources do not permit, then recommend daily use of fluoride toothpaste and provide dietary advice	2–4 times per year for professional application	IB	10
	People at high risk of endocarditis (rheumatic heart disease, previous infective endocarditis, prosthetic cardiac valves, certain forms of congenital heart disease, cardiac transplantation)	Recommend antibiotic prophylaxis prior to dental procedures – refer to management guidelines for specific advice[13]	Opportunistic	GPP	7
Environmental	Communities	Advocate for fluoridation of community water supply		IB	11, 12, 13

*Use a smear of paste for children aged <2 years and a pea-size amount for children ≥2years. Toothpaste with a fluoride concentration of 1000 parts per million (ppm) is recommended unless there is a risk of fluorosis.

Box 1. Advice for good oral health practices[26]

While review with dental professionals is recommended to comprehensively assess for caries risk and the presence of disease, the following general principles are recommended for non-dental professionals:

Assessment

- Visually inspect teeth for evidence of caries, periodontal disease, assessment of maternal caries and/or poor oral hygiene
- Assess oral hygiene practices and consumption of sucrose and sweetened drinks, especially in baby bottles, 'honey on the dummy' or other sweet substances such as glycerine on the dummy, and intake of sugared medicines
- Assess access to fluoridated water supply

Advice

- Brush teeth twice daily with a soft toothbrush and fluoride toothpaste and advise to spit, not rinse, excess paste
- Advise about the hazards of high carbohydrate and acidic snacks and drinks taken between meals
- Advise against high and regular consumption of black cola, sweetened fizzy drinks and sports drinks, with water being the preferred drink
- Promote breastfeeding, with weaning to a baby cup, not a bottle
- If bottles are used, advise against the use of any fluid apart from water and do not put baby to sleep with a bottle
- Advise about smoking cessation and limiting alcohol consumption
- Use sugar-free chewing gum for saliva stimulation
- Use a mouth guard when playing contact sport
- Recommend regular dental check-up

Box 2. Risk factors for dental disease

- Poor oral hygiene practices – for example, no/irregular toothbrushing, use of hard toothbrush, no use of fluoride toothpaste, incorrect brushing technique
- Poor diet and nutrition – for example, high and regular consumption of sucrose-and-carbohydrate-containing foods and drinks, especially black cola, sweetened fizzy drinks
- Salivary composition and flow: if poor, there is less protective effect from saliva
- Low exposure to fluoride
- Xerostomia or dry mouth can also contribute to development of dental caries. Risk factors for xerostomia include use of common medications, including antidepressants, antihypertensives, anticoagulants, antiretrovirals, hypoglycaemics, non-steroidal anti-inflammatory drugs, and steroid inhalers; radiotherapy and chemotherapy for cancers of the head and neck; Sjogren's syndrome; human immunodeficiency virus (HIV) infection; and diabetes, particularly in people with poor glycaemic control
- High consumption of acidic foods and drinks such as sports drinks and juices, can contribute to tooth erosion; bulimia is also an erosion risk factor
- General risk factors for periodontal disease include smoking, diabetes, advancing age, stress, and poor oral hygiene
- Tobacco smoking and alcohol consumption are risk factors for the development of oral cancer; the risk is enhanced when smoking and alcohol consumption occur at the same time
- HIV infection can also contribute to a greater risk of periodontal disease, oral ulceration and cancer
- Other modifying risk factors can include age, socio-economic status and access to oral health services

Resources

General oral health promotion information:

- Australian Indigenous HealthInfoNet, health promotion resources, www.healthinfonet.ecu.edu.au/other-health-conditions/oral/resources/health-promotion
- Australian Dental Association Queensland, oral health resources, www.adaq.com.au/adaq/oral-health
- Dental Health Services Victoria, manuals and toolkits, www.dhsv.org.au/oral-health-resources/guides-and-resources
- NSW Government, resources for Aboriginal and Torres Strait Islander peoples, www.health.nsw.gov.au/oralhealth/Pages/resources-aboriginal-and-torres-strait-islander-people.aspx
- University of Adelaide, key oral health promotion resources, www.adelaide.edu.au/arcpoh/oral-health-promotion/resources
- Smiles for life: A national oral health curriculum, learning modules on oral health for health professionals, www.smilesforlifeoralhealth.com
- University of Adelaide, Dental Practice Education Research Unit, information pamphlets for oral health, www.arcpoh.adelaide.edu.au/dperu/special

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Chapter 9: Respiratory health

Pneumococcal disease prevention

Background

The pneumococcus, *Streptococcus pneumoniae,* is a Gram-positive bacterium with more than 90 serotypes determined by the polysaccharide composition of its capsule, each eliciting type-specific immunity in the host. The mucosal surface of the upper respiratory tract is colonised in humans (mostly asymptomatically) in 50% of the population and spread person to person by respiratory droplets.[1] After colonisation of the nasopharynx, local spread may occur to cause otitis media (most common manifestation in children) or sinusitis; by inhalation to cause bronchitis/pneumonia (estimated to account for one-third of community-acquired pneumonia); or via the bloodstream to other sites including bones, joints and soft tissues, resulting in invasive pneumococcal disease (IPD).[1] The most common presentations of IPD are septicaemia (approximately 70% of presentations in children), meningitis (most severe category with a case fatality rate of 30%) or bacteremic pneumonia (thought to be up to half of hospitalised pneumonia in adults).[1] IPD is a leading cause of morbidity and mortality in children and adults.[2–4]

The highest risk of IPD is in those who are immunocompromised or have functional/anatomical asplenia, the presence of a cerebrospinal fluid leak or cochlear implants. Increased risk or severity of IPD is associated with other chronic medical conditions (eg chronic respiratory diseases, chronic heart disease, chronic liver disease, diabetes mellitus), household crowding, active or passive exposure to tobacco smoke, excessive alcohol consumption, prematurity and childcare attendance. The highest incidence of IPD is seen in children aged <5 years and the elderly.[4] Like other respiratory illnesses there is a distinct seasonal trend, with peak incidence in the winter months.[5]

Aboriginal and Torres Strait Islander people in all age groups have a significantly higher incidence of all pneumococcal disease than non-Indigenous Australians. Detailed data are available only for IPD, which has been notifiable Australia-wide since 2001.[6] Rates of notification for IPD declined in non-Indigenous people from 2005 and onwards when universal childhood pneumococcal conjugate vaccination and adult polysaccharide vaccine were introduced.[5] However, during the period 2005–14, the notification rate of IPD in Aboriginal and Torres Strait Islander people remained 4–8 times higher than for other Australians.[5]

Hospitalisations coded as pneumococcal pneumonia are a potential indicator of the burden of non-invasive pneumococcal infections, and changes in the rates of these hospitalisations may reflect the effect of pneumococcal vaccines on non-invasive disease.[6] There have been substantial overall reductions in IPD and some impact on pneumonia hospitalisations in Aboriginal and Torres Strait Islander children since the introduction of vaccination. Impacts in Aboriginal and Torres Strait Islander adults have been less obvious and may be due in part to the indirect effects of improved herd immunity from childhood vaccination.[5,7] Also, while there has been a reduction in the number of hospital procedures for otitis media in non-Indigenous children, no such reductions have been observed for Aboriginal and Torres Strait Islander children.[6]

Interventions

Currently there are two types of pneumococcal vaccine: conjugate and polysaccharide. Conjugate vaccines are immunogenic in young infants and induce an immune memory response; the vaccine used in the National Immunisation Program Schedule (NIPS) for children since 2011 contains 13 serotypes (13-valent pneumococcal conjugate vaccine [13vPCV]). The polysaccharide vaccine is poorly immunogenic for most serotypes in children aged <2 years and does not induce immune memory; however, it contains 23 serotypes (23-valent pneumococcal polysaccharide vaccine [23vPPV]).[1] In older people who are not immunocompromised, 23vPPV induces a significant immune response.

13vPCV is recommended and funded under the National Immunisation Program (NIP) at two, four and six months of age. The two-month dose may be given at six weeks of age. Because of the increased burden of disease in Aboriginal and Torres Strait Islander children living in Queensland, Northern Territory, Western Australia and South Australia, a booster is recommended and funded at 12–18 months of age. For any medically at-risk children, a fourth dose of 13vPCV is given at 12 months of age with a booster dose of 23vPPV at four years of age.[1]

For those aged 5–18 years who have received a primary vaccination course, further pneumococcal immunisation is only indicated for those at increased risk of contracting or developing serious complications from infection. In the Northern Territory, a dose of 23vPPV is provided to all young people at around age 15 years based on the very high incidence of IPD in this sub-population; this dose should be considered an adult dose. Please refer to the current *The Australian immunisation handbook* for the specific increased risk conditions for other children in this age group.[1] These are categorised as Category A if considered at the **highest** risk and Category B if considered at **higher** risk, and revaccination guidelines depend on the categorisation for these medically at-risk children (Box 1).

Adults (≥18 years) with medical conditions only in Category A (highest risk) are recommended to have a single dose of 13vPCV. For those with a new diagnosis of a severe Category A condition in this age group, a 13vPCV should be given upon diagnosis, with a follow-up dose of 23vPPV two months later. For those with pre-existing Category A conditions who may have received one or more prior doses of 23vPPV, the 13vPCV should be given at least 12 months after the most recent dose of 23vPPV. Currently, adults in Category B are not recommended to receive a dose of conjugate vaccine.[1]

Immunisation with 23vPPV is funded for all Aboriginal and Torres Strait Islander people aged ≥50 years. This is based on the increased risk of IPD in Aboriginal and Torres Strait Islander adults compared with non-Indigenous adults, and the high prevalence of conditions associated with an increased risk of IPD (including tobacco smoking) in Aboriginal and Torres Strait Islander adults >50 years of age, compared with younger ages. A second dose of 23vPPV is recommended five years after the first dose. **No more than three lifetime adult doses of 23vPPV are recommended based on limited data on adverse events and effectiveness,** as well as uncertainty regarding the clinical significance of blunting of antibody response (immune hyporesponsiveness) following revaccination with 23vPPV, especially with multiple revaccinations.[1,8] Please also refer to *The Australian immunisation handbook*[1] for recommendations for pneumococcal vaccination for Aboriginal and Torres Strait Islander people aged ≥50 years with higher (Category B) or highest risk (Category A) conditions.

The CAPITA study in The Netherlands showed that vaccinating older adults with 13vPCV was effective in preventing vaccine-type pneumococcal, bacteremic, and nonbacteremic community-acquired pneumonia and vaccine-type invasive pneumococcal disease but not in preventing community-acquired pneumonia from any cause.[9] As a result of this study, the Advisory Committee on Immunisation Practices in the US then recommended that 13vPCV should be administered in series with 23vPPV to elderly adults.[10] As yet, a recommendation for older Australians to have pneumococcal conjugate vaccines has not yet been made in Australia, and this may be a reflection of the varying and prevalent serotypes and the benefits provided to adults from herd immunity from the childhood pneumococcal vaccine schedule.

Aboriginal and Torres Strait Islander people of all ages have higher rates of pneumococcal disease compared with non-Indigenous people, despite the immunisation programs in place.[4–6] Immunisation programs targeting Aboriginal and Torres Strait Islander people demonstrate substantially lower coverage than recommended, particularly for adults where the indications are based on presence of risk factors rather than age.[6,11] In many Aboriginal and Torres Strait Islander communities, overall immunisation coverage is higher than that in non-Indigenous settings but the timeliness of recommended immunisations lags behind, leaving children under-immunised for their age.[11] Thus, lack of apparent effect of the 23vPPV in the prevention of IPD and pneumonia in at-risk Aboriginal and Torres Strait Islander people may be related to poor uptake rather than vaccine failure.[6]

There is a strong evidence base for the effectiveness of recall and reminder systems in promoting immunisation in primary care,[12] and good evidence for provider prompts, provider audit and feedback.[13,14] Activities should also focus on increasing community awareness of benefits and timeliness of vaccinations and enhancing access to vaccination services (home visits, clinics in public settings, reduced costs).[13,14]

Recommendations: Pneumococcal disease prevention					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Immunisation	All children	Recommend 13-valent pneumococcal conjugate vaccine (13vPCV) at two, four and six months of age	As part of the routine childhood vaccination schedule	IA	1
	Aboriginal and Torres Strait Islander children aged 12–18 months in Queensland, Northern Territory, Western Australia and South Australia	Recommend an additional 13vPCV dose		IA	1
	Medically at-risk children aged <5 years regardless of geographical location (Box 1)	Recommend an additional 13vPCV at age 12–18 months*		IA	1
		Recommend 23-valent pneumococcal polysaccharide vaccine (23vPPV) at age four years		IA	1
	Medically at-risk children aged 5–18 years	Recommend second dose of 23vPPV Time period varies according to risk – Category A (five years after the first dose) and Category B (10 years after the first dose) (Box 1); consult *The Australian immunisation handbook* for details		IA	1
	Aboriginal and Torres Strait Islander children aged 15 years in Northern Territory	Recommend 23vPPV (this should be considered the first adult dose)		IA	1
	Those aged >18 years with the **highest increased risk** of invasive pneumococcal disease (Box 1, Category A conditions)	Recommend 13vPCV	Schedule is complex – refer to *The Australian immunisation handbook*	IA	1
	Those aged >18 years with **increased risk** of invasive pneumococcal disease (Box 1, Category B conditions)	Recommend 23vPPV	Give and repeat vaccination five years later. A third dose may be needed at age 50 years (refer to *The Australian immunisation handbook*)	IA	1
	Aboriginal and Torres Strait Islander people aged ≥50 years	Recommend 23vPPV	Give as part of annual health assessment and repeat vaccination five years later Provide no more than three adult doses in lifetime		1

Recommendations: Pneumococcal disease prevention					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Environmental	Communities	Reduce environmental risk factors for pneumococcal disease, such as exposure to tobacco smoke, overcrowding, poor nutrition, lack of breastfeeding, poor respiratory hygiene, contact with chidren/pets, sudden changes in temperature		IIIB	15–17
		Promote primary care, community-based strategies to improve pneumococcal vaccination uptake and timeliness, particularly using reminder/ recall systems, provider prompts, provider audit and feedback		IB	12, 14
		Activities should also focus on increasing community awareness of benefits and timeliness of vaccines and enhancing access to vaccination services (home visits, clinics in public settings, reduced costs)		GPP	12–14
*For any child, only one booster dose of 13vPCV is required in the second year of life					

Box 1. Conditions associated with an increased risk of invasive pneumococcal disease (IPD) in children and adults, by severity of risk*[1]

Category A: Conditions associated with the highest increased risk of IPD

- Functional or anatomical asplenia
- Immunocompromising conditions, including:
  - congenital or acquired immune deficiency
  - immunosuppressive therapy (including corticosteroid therapy ≥2 mg/kg per day of prednisolone or equivalent for more than one week)
  - radiation therapy, where there is sufficient immune reconstitution for vaccine response to be expected
- Haematological and other malignancies
- Solid organ transplant
- Human immunodeficiency virus (HIV) infection (including acquired immune deficiency syndrome [AIDS])
- Chronic renal failure, or relapsing or persistent nephrotic syndrome
- Proven or presumptive cerebrospinal fluid leak
- Cochlear implants
- Intracranial shunts

Category B: Conditions associated with an increased risk of IPD

- Chronic cardiac disease, particularly cyanotic heart disease or cardiac failure in children
- Chronic lung disease, including:
  - cystic fibrosis
  - severe asthma in adults (requiring frequent hospital visits and use of multiple medications)
- Diabetes mellitus
- Down syndrome
- Alcoholism
- Chronic liver disease
- Tobacco smoking

*Please refer to the full and most up-to-date table (Table 4.13.1) in *The Australian immunisation handbook*[1] for details.

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Influenza prevention

Background

Influenza is a common respiratory disease caused mostly by influenza A and B viruses and transmitted person to person.[1] These viruses cause minor or major epidemics of seasonal influenza in most years, usually during the winter months in temperate climates, but may occur throughout the year in more tropical regions. Overall, the disease burden from influenza is greater in Aboriginal and Torres Strait Islander peoples than in non-Indigenous Australians across all age groups.[1,2] In healthy children and adults who are at low risk of complications, the health impact of influenza is generally mild and is related to absenteeism from school and work. However, severe disease and complications are more likely with advanced age, infancy, lack of previous exposure to antigenically related influenza virus, greater virulence of the viral strain, chronic conditions (heart disease, lung disease, renal failure, diabetes, chronic neurological conditions, conditions leading to immuno-compromise), obesity, pregnancy and smoking.[1,3]

In 2009, the world experienced its first pandemic influenza since 1968 after the emergence of the novel H1N1 influenza strain. Aboriginal and Torres Strait Islander peoples were disproportionately affected by the H1N1 influenza epidemic, being four times more likely to be admitted to hospital and accounting for 13% of the total deaths.[4–6] Given the high rate of complications experienced by Aboriginal and Torres Strait Islander peoples, specialised planning should be considered in managing and preventing harm from future influenza outbreaks.[7,8]

Interventions

Administration of the latest influenza vaccine provides protection against the disease and its complications. Immunisation probably confers protection for about one year, therefore it is recommended that it be given annually, preferably in March or April, prior to the onset of the Australian winter when influenza rates are at their highest.[1]

Previously, only trivalent vaccines were available (containing two influenza A subtypes and one influenza B lineage). Since 2014, an inactivated, quadrivalent vaccine (QIV), which includes the same strains as the trivalent and an additional strain from the other B lineage, has been registered for use in Australia.[1] The additional benefit gained from QIV administration depends on a number of factors. Modelling has suggested that the greatest benefit from QIV administration is in older people, where it is associated with significant reductions in infections and related complications.[9] Some have argued, however, that prioritisation of immunisation to include those at high risk of transmission is more important than the vaccine type.[10] The Australian Technical Advisory Group on Immunisation (ATAGI) recommends QIV; however, it advises that trivalent vaccine is an acceptable alternative, particularly if there is a risk of delayed vaccination due to supply barriers for QIV.[1]

The efficacy and effectiveness of both influenza vaccines also depends on the following: the age and immuno-competence of the recipient; the degree of similarity between the virus strains in the vaccine and those circulating in the community; and the endpoint measured (influenza-like illness, laboratory-confirmed influenza, general practice visits, hospitalisations, complications, mortality).[1] Vaccine effectiveness (VE) estimates for laboratory confirmed influenza for Australia 2012–14 ranged from 38% to 60%, with better VE for A(H1N1) and B strains than A(H3N2) strains.[11]

Annual influenza vaccination is recommended for any person aged ≥6 months for whom it is desired to reduce the likelihood of becoming ill with influenza.[1] However, in healthy adults, influenza vaccines have only a modest effect in reducing influenza symptoms and working days lost, and no effect on hospital admission or complication rates.[12]

Vaccination is strongly recommended, actively promoted and funded for Aboriginal and Torres Strait Islander people aged six months to <5 years and >15 years, and for all individuals aged >6 months with chronic disease.[1,2,13] This is because of the higher risk of hospitalisation and complications from influenza in these groups compared to others not in these groups.[1,13,14] The risk of influenza complications is not as high in healthy

children aged 5–14 years. There remains some conflicting evidence on the benefits of influenza vaccination for all chronic disease groups;[15–18] however, the strongest evidence of benefit is related to decreased complications in chronic obstructive pulmonary disease (COPD),[19,20] diabetes[21,22] and liver disease.[23,24]

Influenza vaccination has been found to be efficacious in preventing cases of influenza in children aged >2 years,[3,25–27] and two vaccine doses provide better protection than one dose if a child is being vaccinated against influenza for the first time.[28,29] In Australian children, the burden of hospitalised influenza is highest in those aged 0–4 years.[2] In this age group, rates of hospitalisation for Aboriginal and Torres Strait Islander children are higher than for other children: 2.5 times higher for those aged 0–5 months (but vaccination is not recommended for this age group) and for those aged six months to <2 years, and 1.4 times higher for those aged 2–4 years.[2] There is also some evidence that vaccinating children at age 2–5 years may reduce the incidence of pneumonia and influenza in the elderly.[30]

During the 2010 influenza season, an excess number of cases of febrile reactions and febrile convulsions were observed in paediatric populations following immunisation with one of the registered seasonal trivalent influenza vaccines. This led to the suspension of the provision of this particular vaccine to children aged <5 years; however, the Therapeutic Goods Administration (TGA) and the ATAGI continued to recommend other brands of seasonal influenza vaccine for children for whom it was indicated.[31,32] A national vaccine safety surveillance system (AusVaxSafety) has demonstrated low rates of fever and medical attendance after appropriate influenza vaccine in young children in the 2015 influenza season.[33]

Influenza vaccination during pregnancy is recommended based on the increased morbidity and mortality of pregnant women who contract influenza,[3,14,34] and because the transplacental transfer of antibodies to fetus may protect infants for the first six months of life when the risk of hospitalisation for influenza is greatest.[2,34] There is also no evidence of harm to the mother,[35,36] the pregnancy[37,38] or the newborn[34,35,37] from immunisation in pregnancy. Recommendations from antenatal care providers may play a key role in increasing coverage in this group.[39]

Australian guidelines recommend annual influenza vaccine should be offered to all Aboriginal and Torres Strait Islander people aged >6 months. Effective strategies to promote influenza immunisation should be undertaken at a community level and tailored to the needs of the community concerned. Health services are encouraged to implement recall and reminder systems to support systematic vaccine coverage of the community.[40–42]

Infection control measures such as handwashing, particularly around young children, can be effective in preventing transmission of influenza.[43] It is unclear if the addition of virucidals or antiseptic agents is more effective at preventing the transmission of respiratory viruses than routine handwashing with soap.[43] Healthcare providers can potentially transmit influenza to patients, and it has been shown that vaccination of healthcare workers confers benefit to those at high risk of influenza complications.[44,45] Implementing barriers to transmission, such as isolation and hygienic measures (wearing masks, gloves, gowns), can be effective in containing respiratory virus outbreaks or in hospital wards. However, there is only limited evidence that social distancing (restricting where people can gather in order to stop or slow the spread of infectious diseases – eg limiting large gatherings of people, closing buildings or cancelling events) is effective in reducing transmission.[43]

Two classes of antiviral drugs are available for the treatment and prevention of influenza – the neuraminidase inhibitors (NIs) zanamivir and oseltamivir, which are active against both influenza A and B; and the adamantanes amantadine and rimantidine, which are only active against influenza A.[6] The NIs oseltamivir (taken orally) and zanamivir (inhaled) are approved for use in Australia for the treatment and prevention of influenza A and B.[46,47] Systematic reviews on the effectiveness of NIs for influenza prophylaxis in inter-pandemic years have come to conflicting conclusions. They generally show only a very minor effect in preventing symptomatic influenza infection in individuals/households, and have been associated with adverse effects such as headache, nausea, psychiatric effects and renal events in adults and vomiting in children.[48] Consequently, NIs are not routinely recommended for the prevention of influenza in healthy adults.[49] They may, however, have a role in prophylaxis for people at high risk of complicated influenza who are close contacts of an infected individual and when therapy can be initiated within 48 hours of exposure.[49] An alternative to routinely offering prophylaxis in such individuals is to start antiviral treatment promptly when symptoms of influenza start.[49]

Post-exposure prophylaxis with NIs continue to be recommended for vulnerable Aboriginal and Torres Strait Islander close household contacts during influenza outbreaks within communities as there are some studies showing prophylaxis can reduce household transmission of influenza,[50] but there should be consultation with the local public health unit.

With respect to treatment of established influenza infection, NIs have been shown to slightly reduce the time to alleviation of initial symptoms in adults. However, there is limited evidence that NIs significantly alter complication rates. There is some evidence that oseltamivir reduces the risk of unverified (not radiologically confirmed) pneumonia and that zanamivir reduces the risk of bronchitis. Neither agent is effective in reducing otitis media, sinusitis, other serious complications or hospitalisations.[48] Public Health England recommends that if treatment is started for those who are at risk of complications or who have moderate/severe disease, it should be done within 48 hours of onset of symptoms.[49]

Recommendations: Influenza prevention

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Immunisation	Aboriginal and Torres Strait Islander people at high risk of influenza-related complications: Children aged ≥6 months to <5 years Youth and adults aged >15 years	Offer vaccination to high-risk groups in the pre-influenza season months (March–April)	Annual	IIB	1, 13, 32
	All individuals aged ≥6 months with a chronic disease	Prioritise provision of vaccination to high-risk groups in the pre-influenza season months (March–April)	Annual	IIC	1
	Healthcare providers	Offer influenza vaccine in the pre-influenza season months for the prevention of influenza (March–April)	Annual	GPP	1, 45
	Women who are pregnant or planning a pregnancy	Offer immunisation at the first antenatal visit or with pre-conception counselling	Part of routine antenatal care (refer to Chapter 2: Antenatal care)	IIB	1, 35
	All others aged ≥6 months for whom it is desired to reduce the likelihood of becoming ill with influenza	Offer influenza vaccine in the pre-influenza season months	Annual	GPP	1
	Children aged <6 months	Influenza vaccination **not** recommended		GPP	1
Behavioural	Those at higher risk of complications due to smoking and/ or obesity	Encourage weight loss and/or smoking cessation		GPP	
	Household contacts of a person with influenza	Recommend good hygiene practices, such as frequent handwashing and covering the mouth on coughing or sneezing, to decrease the spread of influenza, particularly from children to other household members	Opportunistic	IIIC	43

Recommendations: Influenza prevention					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	Healthcare workers	Minimise exposure risk to patients by adhering to infection control guidelines In addition to standard infection control procedures, personal protective equipment is recommended during influenza pandemics			1, 45
Chemo-prophylaxis	Healthy adults	Neuraminidase inhibitors (NIs) are generally not indicated for the prevention of influenza		IIB	48, 49
	People at high risk of influenza complications where there are high levels of circulating virus	Consider using NIs for high-risk individuals in close contact with someone with a proven case of influenza (ideally initiated within 48 hours)	Opportunistic	GPP	49, 51,
Environmental		Primary care, community-based strategies to improve vaccination levels, particularly using reminder/recall systems, provider prompts, provider audit and feedback should be implemented		IB	40–42, 44
	Communities	Activities should also focus on increasing community awareness of benefits and timeliness of vaccines for vaccinations (media campaigns) and enhancing access to vaccination services (home visits, clinics in public settings, reduced costs)		GPP	40–42, 44, 52

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Asthma

Background

Among Aboriginal and Torres Strait Islander peoples, respiratory illnesses are the most commonly reported chronic illness in those aged ≤35 years and the second most common in those aged >35 years.[1] Of these respiratory illnesses, asthma is the most common.[1] In many remote and regional Aboriginal and Torres Strait Islander communities, asthma is commonly known as 'short wind'.

Asthma, a heterogeneous disorder, is a chronic inflammatory disease of the airways characterised by variable and recurring symptoms of airway obstruction and bronchial hyper-responsiveness.[2] The dominant features of the clinical history are recurrent episodic symptoms of wheeze, chest tightness, difficulty in breathing and shortness of breath, with or without cough.[3] In the consideration of the diagnosis of asthma, the presence of symptoms and signs suggestive of other diagnoses is important.[3] Chronic suppurative lung disease (CSLD), including bronchiectasis, and chronic obstructive pulmonary disease (COPD) can also clinically manifest as wheeze and airway obstruction and be associated with bronchial hyper-responsiveness and asthma (what is termed an 'overlap syndrome').[4–6] (Refer to Chapter 9: Respiratory health, 'Bronchiectasis and chronic suppurative lung disease' and 'Chronic obstructive pulmonary disease'.) As treatment and secondary prevention are different for these conditions and because they are also common among Aboriginal and Torres Strait Islander peoples,[5,7] it is important to differentiate these conditions in primary care. It is also possible that treatment may need to be required for more than one condition at the same time.

After many years, the reversibility of airflow limitation may be incomplete in some people with asthma, particularly in adulthood, due to airways remodelling.[8] Recent cohort data suggest that people with asthma are at higher risk of developing fixed airflow obstruction consistent with COPD in adulthood.[8]

The diagnosis of asthma is predominantly clinical but in older children and adults, spirometry, including testing for early reversibility with salbutamol, is the preferred initial test to determine the presence and severity of airways obstruction.[3] Children aged >6 years are usually able to perform spirometry. However, normal spirometry, particularly when the patient is not symptomatic, does not exclude asthma.[3] Thus, specialised tests for airway hyper-responsiveness (eg an exercise test) are sometimes undertaken.[3,9] Also, caution needs to be exercised in the interpretation of spirometry data in Aboriginal and Torres Strait Islander people as valid reference values are not available.[10] It is recommended to not use ethnic adjustment when undertaking spirometry in Aboriginal and Torres Strait Islander people as it is unknown if the reported lower levels reflect the true healthy reference range for Aboriginal and Torres Strait Islander peoples.[10] Prior studies[11,12] suggest that using ethnic adjustment, or any of the Aboriginal and Torres Strait Islander reference equations, is inappropriate. In the late 1990s, it was found that the majority of Torres Strait Islander children with asthma (many had poorly controlled asthma) had spirometry values in the healthy Caucasian range (median forced expiratory volume in one second [FEV_1] = 87% predicted [range 52–112], forced vital capacity [FVC] 91% [75–118]).[11] In later studies, after several years of clinical service and education,[12,13] the mean FEV_1 in Aboriginal and Torres Strait Islander children with asthma was 95% predicted (standard deviation [SD] 18) and FVC 100% (SD 17).[12] These studies suggest that spirometry values even in 'non-healthy' Aboriginal and Torres Strait Islander children (a) can be improved with clinical care, and (b) are in the Caucasian range for normal predicted values. The use of lower reference values in Aboriginal and Torres Strait Islander people will place those with lung disease in the healthy range and likely lead to misdiagnosis and/or deprive them of appropriate intervention.

Survey data indicates asthma affects 18% of Aboriginal and Torres Strait Islander people, compared to 10% of the non-Indigenous Australian population.[1] While 21% of Aboriginal and Torres Strait Islander people who live in major cities report having asthma, only 12% of those who live in very remote regions do.[14] Lung function data from the Australian Burden of Obstructive Lung Disease (BOLD) study suggest that the diagnostic accuracy of such survey data may overstate the burden of asthma in adults in this setting. In this study of people living in the Kimberley region, 3.1% of Aboriginal people aged ≥40 years assessed were found to have, on spirometry, airflow obstruction that was completely reversible with salbutamol, compared with 7.7% of non-Indigenous Australians. Some of the people in this study may have COPD rather

than asthma, but as the participants did not have an airway challenge, the diagnosis of asthma cannot be excluded.[15] Whatever the true prevalence of asthma may be, its impact remains significant, and compared with non-Indigenous Australians, Aboriginal and Torres Strait Islander peoples have 2.3 times the rate of death (four per 100,000 population) due to asthma, with the largest disparity in the 35–54 years age group.[16]

To decrease the burden of asthma, prevention and better management of those with asthma are required.[9,17] Despite a large number of studies, there are few primary prevention measures with a high level of evidence that can be currently recommended.[18] This reflects the multifactorial, complex and incompletely understood mechanisms for developing asthma. It likely involves the interplay of genetics, epigenetics, early viral and bacteria infection,[19] and environmental, behavioural and lifestyle factors.[2] External factors such as environmental and lifestyle factors interact with genetic factors, such as allergic tendency, to increase the risk of developing asthma.[2] However, reliably predicting the risk of asthma is difficult and there are no data specific to Aboriginal and Torres Strait Islander peoples. Known generic risk factors include a family history of asthma and allergies (particularly maternal), atopy, obesity, work-related exposures and diet.[3] While observational studies have found many other risk factors (eg low levels of vitamin D,[18] selenium), the data are inconsistent and outcomes do not appear to be improved with intervention trials.[20,21]

Although there are no data specific to Aboriginal and Torres Strait Islander peoples, in the general population around 5% to 20% of new, adult onset asthma is related to occupational factors, representing the most common cause of new-onset adult asthma.[18,22] For people with high-risk occupations (eg those exposed to isocyanates, flour, wood and grain dust, animals and latex), the presence of non-specific bronchial hyper-responsiveness, allergic rhinitis and smoking is associated with increased risk for occupational asthma, but the positive predictive values of such markers are too low to make them useful for screening purposes.[18,22,23]

Interventions to decrease the risk of developing asthma

The most important and modifiable risk factor to reduce asthma is reducing both in-utero and childhood environmental tobacco smoke (ETS) exposure.[3] This is of particular importance given the high rates of in-utero smoke exposure, ETS exposure for Aboriginal and Torres Strait Islander children and active smoking among adults.[1] Interventions to reduce both smoking among pregnant women and ETS exposure reduce the risk of childhood wheeze, asthma and later persistent asthma.[3] A study of children hospitalised for asthma in Darwin found that a significantly higher proportion of Aboriginal and Torres Strait Islander children (95.2%) were exposed to ETS compared with non-Indigenous children (45.7%).[24]

Except for avoidance of ETS and in-utero tobacco smoke exposure, there are currently few practical, evidence-based preventive strategies to reduce the development of asthma.[3] Given its many broader health benefits, and a potential protective effect against developing asthma in the early years, breastfeeding is encouraged.[3] In children at risk of developing asthma, in-utero or childhood avoidance of house dust mites or pets is not an effective primary preventive measure and hence should not be recommended.[3] Likewise, maternal food allergen avoidance during pregnancy and lactation is not recommended.[3] Sensitisation to allergens, such as house dust mites and cats, is associated with asthma, but interventions to reduce exposure to these allergens in childhood have not been shown to prevent asthma.[3] While multi-faceted interventions (dietary allergen reduction combined with reduction to aeroallergens through environmental manoeuvres) reduce asthma in children at risk of developing asthma, this cannot be recommended given the inconvenience, cost and demands on the family.[3]

The evidence for the link between obesity and asthma has increased, although consistent randomised controlled trial evidence is currently lacking. While it is clear obesity can be associated with breathlessness and wheeze, this may be due to increased work of breathing and is not necessarily associated with airway hyper-responsiveness consistent with asthma. Nevertheless, children who are obese or overweight should be offered weight reduction programs to reduce the risk of developing asthma.[3] Likewise, weight reduction in adults who are obese should also be promoted to improve general health and reduce asthma-like symptoms.[3]

Diets high in fruit and vegetables have been shown to be associated with less asthma in children and adults in observational studies.[3] However, no intervention studies relating to asthma have been reported.[3] There is insufficient evidence that dietary supplements for mothers or infants with probiotics, fish oil, modified

infant formula or antioxidants are of benefit in reducing childhood asthma.[3] Also, a randomised controlled trial found that using inhaled corticosteroids in children with a high risk of developing asthma did not prevent the development of asthma and hence is not recommended as a preventive measure.[25]

Reducing exposure to potential environmental factors such as allergens in the workplace may decrease occupational risks of developing asthma. However, total avoidance of the allergen is the best strategy.[23,26] This is not straightforward as 'prevention has its own ethical, anthropological, economical dilemmas'.[23] Reduction in exposure levels, including the use of respiratory protective equipment, should be viewed as a 'last resort' option and reduces but does not eliminate the risk of occupational asthma.[23]

Given the higher morbidity and mortality rates in Aboriginal and Torres Strait Islander peoples compared to non-Indigenous people with asthma,[16,27] secondary preventive measures are important in primary care. Effective asthma management resulting in good asthma control reduces exacerbations, hospitalisations and death.[3,9] Thus, all Aboriginal and Torres Strait Islander people with asthma should receive culture-appropriate education,[3,28] and be regularly reviewed and managed in accordance with clinical practice guidelines using a stepwise approach in the use of the various classes and doses of asthma medications.[3,9]

Recommendations: Asthma

Prevention intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All people	Routine screening for asthma is not recommended Early detection strategies should be considered (eg clinical vigilance, detailed history considering mimics of asthma, and spirometry when symptoms are suggestive of asthma)		GPP	
Behavioural	Children	Maternal dietary restrictions during breastfeeding or pregnancy are not recommended for the prevention of asthma		III–IIB	3
	All	A high intake of fruit and vegetables should be recommended to those with a high risk of asthma*	Opportunistic	III–IIID	3
	All	Advise weight reduction for people with obesity and overweight	Opportunistic	III–IIB	3
Chemo-prophylaxis	Children at risk of asthma	Immunotherapy is not recommended for the prevention of asthma	Opportunistic	IIB	3, 9
		Inhaled corticosteroids are not recommended for the prevention of asthma	Opportunistic	IIB	25
	Children and adults with asthma, including pregnant women	Assess whether asthma preventer therapies are indicated and optimise asthma control (refer to 'Resources' for recommended guidelines)	Opportunistic and as part of annual health assessment	IA	3, 9

Recommendations: Asthma					
Prevention intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Environmental	Infants at risk of exposure to environmental tobacco smoke (ETS) both in-utero and in the postnatal period	Advise and assist pregnant women to avoid smoking (refer to Chapter 2: Antenatal care) Advise parents/carers who smoke about the harms of ETS and the need to limit childhood exposure, particularly in confined spaces (eg homes and motor vehicles) (refer to Chapter 1: Lifestyle, 'Smoking')	Opportunistic	III–IA	3
	Children and adults at risk of exposure to ETS	Recommend strategies to promote a smoke-free environment	Opportunistic	III–IA	3
	People with or at risk of asthma	Advise families that interventions to reduce exposure to airborne allergens such as house dust mites and pets do not prevent asthma or improve outcomes for people with asthma	Opportunistic	IA	3
	People with or at risk of asthma who currently smoke	Provide smoking cessation advice to people who smoke (refer to Chapter 1: Lifestyle, 'Smoking')	Opportunistic	III–IA	3
	Workers in high risk workplaces, where exposure to occupational dusts and chemicals are likely	Conduct routine medical surveillance for new onset of asthma Discuss implications of work, exposure, economic balance and, if necessary, seek advice from occupational health physician Recommend complete avoidance of exposure to the occupational hazard. Use respiratory protective equipment as a 'last resort' option if complete avoidance is not possible	Opportunistic	III–IIIB	23, 29

*Risk factors include a family history (particularly maternal) of asthma and allergies, a past history of atopy and food allergies in early life, obesity, low birth weight, in-utero tobacco exposure, tobacco smoking, ETS, environmental pollution, work-related exposures.[3,18,23,29]

Resources

Clinical practice guidelines: Australia

- National Asthma Council Australia, *Australian asthma handbook version 1.2*, www.asthmahandbook.org.au – Section on 'Managing asthma in Aboriginal and Torres Strait Islander people', www.asthmahandbook.org.au/populations/atsi-peoples/management

Clinical practice guidelines: International

- British Thoracic Society, Scottish Intercollegiate Guidelines Network, *British guideline on the management of asthma: A national clinical guideline*, www.brit-thoracic.org.uk/document-library/clinical-information/asthma/btssign-asthma-guideline-2016
- Global Initiative for Asthma (GINA), www.ginasthma.org

Education flipcharts

- Menzies School of Health Research, Asthma in adults, www.menzies.edu.au/page/Resources/Asthma_in_Adults
- Menzies School of Health Research, Asthma (short wind in children), www.menzies.edu.au/page/Resources/Asthma_short_wind_in_children

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Chronic obstructive pulmonary disease

Background

Chronic obstructive pulmonary disease (COPD) is characterised by persistent respiratory symptoms and chronic obstruction of lung airflow that is not fully reversible. It is a serious, progressive and disabling disease and a major cause of hospital admission and premature death in Australia. The mortality rate from COPD among Aboriginal and Torres Strait Islander peoples is 2.6 times that of other Australians.[1] Given that cigarette smoking remains the most important cause of COPD,[2] high rates of smoking among Aboriginal and Torres Strait Islander peoples is the major driver in disparity from COPD-related disease burden.[3] Importantly, however, COPD also occurs in people who have never smoked. Other important risk factors are exposure to environmental smoke, occupational dusts and fumes, air pollution and individual susceptibilities, including genetic factors and damaged airways due to childhood infections.[4,5] Longstanding or poorly controlled asthma can lead to chronic irreversible airways obstruction, and it is also recognised that some people have co-existing asthma and COPD.[2]

The accurate diagnosis of COPD is vital and rests on the demonstration of airflow limitation that is not fully reversible.[2] This requires the use of spirometry. The presence of forced expiratory volume in one second (FEV_1)/forced vital capacity (FVC) less than 70% and FEV_1 less than 80% of the predicted value after the use of a bronchodilator confirms the diagnosis of COPD.[2] In people with suspected COPD and no evidence of airflow limitation, an alternative diagnosis should be sought. Other conditions to consider would include bronchiectasis, heart failure, chronic infections (including tuberculosis) and interstitial lung disease.

COPD is commonly associated with other diseases, including heart disease, obstructive sleep apnoea, lung cancer, stroke, anxiety and depression. These conditions should also be actively identified and carefully managed in a holistic approach for Aboriginal and Torres Strait Islander people who have COPD.[6]

Early detection

The possibility of COPD should be actively considered in all people who smoke or are ex-smokers aged >35 years. Given the lack of evidence of population-level screening for COPD, widespread screening of asymptomatic individuals is not recommended.[7] However, targeted early case finding in primary care appears to be beneficial in finding people with COPD, thus avoiding late diagnosis.[8] Australian guidelines recommend that people who are clinically suspected to have COPD should be opportunistically checked for symptoms, followed by spirometry if warranted, as part of a targeted case-finding approach.[2] COPD symptom questionnaires have been shown to be successful in practice-led case finding.[9] The Lung Foundation Australia has developed an 'Indigenous Lung Health Checklist' that may also assist in identifying people who have COPD (refer to 'Resources').

Interventions

The single most important intervention to prevent or reduce the progression of COPD for most people is smoking avoidance and smoking cessation, and therefore strenuous efforts should be made to assist people with COPD who smoke to quit.[2] Similarly, environmental risk factors for COPD, such as fumes, gases, occupational dusts and chemicals, and indoor and outdoor air pollutants, should be avoided.[10]

There is good evidence of benefit from annual influenza vaccination in people with moderate to severe COPD, with reduction in hospitalisations, complications and death. Influenza vaccination should therefore be given in early autumn to all such patients.[2,10] Pneumococcal vaccine prevents lower respiratory tract infections in people with severe COPD and people aged >65 years with or without chronic disease, consequently pneumococcal vaccine is recommended in these groups.[10] Australian guidelines for Aboriginal and Torres Strait Islander peoples also recommend offering influenza immunisation for all people from six months of age. The greatest clinical benefit is found in the following Aboriginal and Torres Strait Islander

groups: children with a chronic disease, children aged six months to <5 years, and those aged ≥15 years. Pneumococcal vaccination (polyvalent covering 23 virulent serotypes) is also recommended for all Aboriginal and Torres Strait Islander people at significant risk of pneumococcal infection, which includes people with chronic lung disease regardless of their age or severity.[10,11]

While inhaled medicines have not been shown to modify the steady decline of lung function, which is the hallmark of COPD, they do provide symptom relief, an initial increase in lung function, improvement in quality of life, and prevention of exacerbations of COPD.[2,10] The principal goals of non-pharmacological and pharmacological therapy for COPD are to optimise function through symptom relief with medications, regular exercise and pulmonary rehabilitation, and to reduce future risk of complications.[2,10] Patients with more severe COPD require multidisciplinary team care, including strategies to support chronic disease self-management and social and emotional wellbeing, including carer wellbeing.[2] Pulmonary rehabilitation reduces dyspnoea, fatigue, anxiety and depression, improves exercise capacity and health-related quality of life, enhances patients' sense of control over their condition and reduces exacerbation rates.[11] A COPD written action plan, with education, reduces hospitalisations.[12]

Recommendations: Chronic obstructive pulmonary disease

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Immunisation	People with an established diagnosis of chronic obstructive pulmonary disease (COPD)	Offer influenza vaccine in the pre-influenza season months (March–April) for the prevention of influenza	Annually	IB	2, 10
		23-valent pneumococcal polysaccharide vaccine (23vPPV) is recommended for the prevention of invasive pneumococcal disease and lower respiratory tract infections	Refer to Chapter 9: Respiratory health, 'Pneumococcal disease prevention'	IIC	2, 10, 13
Screening*	People aged >35 years who currently smoke or are ex-smokers	Check for symptoms of COPD as part of a targeted, active case-finding approach. Consider the use of a symptom questionnaire to assist with case finding (refer to 'Resources')	Opportunistic	IIB	2, 9
	All others presenting with symptoms, especially shortness of breath, chronic bronchitis (cough and sputum) and recurrent acute bronchitis	If symptoms of COPD are present, spirometry is indicated to assess for the presence of airflow obstruction and to assess its severity	Opportunistic	IA	2, 10
		Spirometry is not recommended to screen healthy adults who do not report respiratory symptoms		IA	2, 10, 14
Behavioural	All people	Advise of the importance of not smoking to prevent COPD (refer to Chapter 1: Lifestyle, 'Smoking')	Opportunistic	IA	2, 10

Recommendations: Chronic obstructive pulmonary disease					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	People with an established diagnosis of COPD who currently smoke	Smoking cessation reduces the rate of decline of lung function. Counselling and treatment of nicotine dependence should be offered to all people who smoke, regardless of the degree of airflow obstruction (refer to Chapter 1: Lifestyle, 'Smoking') Consider referral to pulmonary rehabilitation as it has been shown to reduce COPD exacerbations	Opportunistic	IA	2, 10, 14 11
Chemo-prophylaxis	People with an established diagnosis of COPD	Pharmacotherapy does not modify decline in lung function but is beneficial in decreasing symptoms associated with COPD, providing an initial increase in lung function, improving quality of life, and preventing future exacerbations of disease		IA	2, 10
Environmental	All people	Advise that risk factors for COPD (eg occupational exposures, environmental tobacco smoke and indoor and outdoor air pollution and irritants) should be minimised. This may include strategies such as ensuring adequate ventilation when cooking with solid fuels, avoidance of irritants and reduction of emissions in the workplace (refer also to recommendations in Chapter 1: Lifestyle, 'Smoking')		IIIC	4, 10

*Targeted case finding has been included under the category of screening, given its importance in the diagnosis of those people with symptoms.

Resources

- Thoracic Society of Australia and New Zealand, *The COPD-X plan: Australian and New Zealand guidelines for the management of chronic obstructive pulmonary disease (includes Concise guide for primary care and Stepwise management of stable COPD),* www.copdx.org.au
- Lung Foundation Australia, Indigenous lung health checklist and General lung health checklist COPD screening questionnaires, http://lungfoundation.com.au/lung-health-checklist
- Lung Foundation Australia, Primary care respiratory toolkit (includes spirometry calculator and lung age estimator), http://lungfoundation.com.au/health-professionals/clinical-resources/copd/primary-care-respiratory-toolkit
- Global Initiative for Chronic Obstructive Lung Disease (GOLD), http://goldcopd.org

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Bronchiectasis and chronic suppurative lung disease

Background

The diagnosis of bronchiectasis, defined as irreversible airway dilatation, is based largely on the findings of high-resolution computed tomography (HRCT) chest scans. The use of such a radiological definition can be problematic for several reasons. This is particularly the case for Aboriginal and Torres Strait Islander people living in remote areas where access to CT scanning can be limited, and for very young children who need a general anaesthetic.[1] Nonetheless, the increasing availability of CT scanners means a CT-based diagnosis should be pursued where feasible. Given these limitations, in clinical guidelines specific to Aboriginal and Torres Strait Islander people living in remote regions and in the national guidelines,[1,2] an additional term of chronic suppurative lung disease (CSLD) is used when symptoms and/or signs of bronchiectasis are present without available confirmation of HRCT features.[2] In this document, bronchiectasis will be used to refer to both bronchiectasis and CSLD.

The symptoms and/or signs of bronchiectasis include recurrent (>3 episodes) wet or productive cough, each lasting for >4 weeks, with or without other features including exertional dyspnoea, symptoms of airway hyper-responsiveness, recurrent lower respiratory tract infections (including pneumonia), growth failure, digital clubbing, hyperinflation and chest wall deformity.[2]

Bronchiectasis has had a declining incidence over the last century. However, in the last decade, it is increasingly recognised as an important contributor to chronic respiratory morbidity in both Aboriginal and Torres Strait Islander people[1] and non-Indigenous children and adults in Australia,[3,4] as well as globally.[5,6] It is also increasingly recognised as an alternative or concomitant diagnosis to common respiratory conditions such as 'difficult asthma' and chronic obstructive pulmonary disease (COPD).[7,8] In a cohort of newly referred adults with 'difficult asthma', bronchiectasis was detected in 40%.[9] In part, this greater prevalence of disease may be related to the increasing availability of a highly sensitive diagnostic tool, namely HRCT. Systematic reviews have described a prevalence of bronchiectasis in COPD of 20–69%.[8] However, there are no such studies among Aboriginal and Torres Strait Islander people with COPD.

In Aboriginal and Torres Strait Islander people, CSLD and bronchiectasis is anecdotally common but there is little published data. In the Northern Territory, the incidence in Aboriginal and Torres Strait Islander infants (first year of life) is 1.18 per 1000 child years (95% confidence interval [CI], 0.60–2.16)[10] and the prevalence is one in every 68 children aged <15 years.[11] Hospitalisation rates for patients with bronchiectasis are increasing in Queensland (age standardised rate of ~65/100,000 in 2005 to ~90/100,000 in 2009),[12] with the rate in Aboriginal and Torres Strait Islander peoples about 2.7 times that for non-Indigenous Queenslanders in 2009.[12] There are no data for urban-dwelling Aboriginal and Torres Strait Islander peoples, but a national multicentre study that included Central Australia, Darwin and the Torres Straits found that among children newly presenting to a respiratory service with chronic cough, Aboriginal and Torres Strait Islander children have a significantly higher incidence of radiological bronchiectasis compared to non-Indigenous children: 29.4% versus 6.7% respectively, $P = 0.001$.[13]

The morbidity of people with bronchiectasis includes increased hospitalisation, excess days off work/school, poor quality of life, and complications associated with chronic cough.[14] Complications associated with bronchiectasis extend beyond the respiratory system and include cardiac problems (eg impaired left ventricular diastolic function,[15] cor pulmonale), systemic effects (eg reduced wellbeing and increased acute phase reactants),[16] sleep disturbance[4] and psychological difficulties associated with anxiety and depression.[17,18] Furthermore, chronic endobronchial infection, which is present in CSLD and bronchiectasis, is an independent risk factor for atherosclerosis, coronary heart disease and coronary deaths.[19–21]

The only published Australian mortality data for bronchiectasis are from Central Australian hospital-based cohorts (note: some people were in both cohorts). In the first study of 61 adults (97% were Aboriginal), 11.5% of people died within 12 months.[22] The cohort comprised predominantly middle-aged adults (mean age 42 years, standard deviation [SD] 15 years), and most had not received standard care (eg only 13 [21.3%] had lung function tests performed).[22] The second study[23] reported the prevalence of hospitalised bronchiectasis as 103 per 10,000 population, and 34% of the cohort died at a median age of 42.5 years. Overseas, mortality rates vary widely from four year survival of 58% (Turkey) to 75% survival at 8.8 years (Finland).[24]

Interventions

Despite the considerable prevalence and disease burden, services for bronchiectasis are under-resourced when compared with other chronic respiratory diseases.[25] The European Respiratory Society regards bronchiectasis as one of the most neglected chronic respiratory diseases.[26] Effective clinical management reduces both short-term[27] and long-term morbidity associated with bronchiectasis.[28,29] There is increasing evidence that intensive treatment of children who either have bronchiectasis, or who are at risk of developing severe bronchiectasis, prevents poor lung function in adulthood.[14,30] Cohort data have shown that approximately 80% of newly diagnosed adults with bronchiectasis were symptomatic since childhood, and that the duration of chronic cough (the most common symptom of bronchiectasis[2]) is inversely related to lung function at diagnosis. This means that the longer the duration of cough, the poorer the lung function at diagnosis based on forced expiratory volume at one second (FEV_1).[31] Optimal overall management and treatment can potentially prevent chronic respiratory disease in a substantial number of people.[32] Although robust trials are needed, primary care health providers can play a crucial role in the recognition and early detection of disease as well as in long-term management to prevent complications and premature death.[1]

Immunisation (pneumococcal, influenza) is effective in preventing severe and recurrent acute respiratory illnesses (ARIs);[33] however, data of its effectiveness specific to the Aboriginal and Torres Strait Islander health context are lacking.[34] Delayed immunisation (ie poor timeliness)[35] is one postulate why 7-valent pneumococcal conjugate vaccine (7vPCV) did not reduce ARIs in Aboriginal peoples and Torres Strait Islander children. This is in contrast to global data that has shown substantial ARI reduction post–PCV.[36]

Aboriginal and Torres Strait Islander children hospitalised with pneumonia are 15 times more likely to develop bronchiectasis than non-Indigenouschildren, and for recurrent pneumonia the risk increases further.[37] One cohort study described that 25.6% of Aboriginal children hospitalised for lobar pneumonia had a new diagnosis and treatable chronic respiratory illness (18% bronchiectasis) on follow-up.[38] In a follow-up study of Aboriginal children hospitalised with bronchiolitis, the presence of cough at three weeks post-discharge increased the odds of having bronchiectasis diagnosed by 13 months.[39] Differentiating between bronchiectasis as a cause or consequence of an earlier admission diagnosed as pneumonia or bronchiolitis can be problematic. Nevertheless, given the likely link between lower ARIs and bronchiectasis,[37,38] as well as the association between duration of chronic cough and lung function decline in adults,[31] it is good clinical practice for all children and adults with lower ARIs to be reviewed in primary care at least three to four weeks post-ARI, especially post-hospitalisation. They should be screened for the presence of chronic cough and persistence of other respiratory symptoms and signs (eg wheeze and crackles in chest auscultation).

When chronic (>4 weeks) wet cough is present, appropriate antibiotics (covering common respiratory pathogens – *Streptococcus pneumoniae, Moraxella catarrhalis, Haemophilus influenzae*) are recommended. In a Cochrane meta-analysis, the cure rate in children who received antibiotics was significantly higher than in controls, and the number of children needed to treat to demonstrate a benefit at two weeks was three.[40] Further, progression of illness, defined by requirement for further antibiotics, was significantly lower in the treatment group.[40]

The most common symptom of CSLD/bronchiectasis is chronic cough.[1] Data has shown that Aboriginal people and Torres Strait Islander children newly referred with chronic cough have a significantly higher likelihood of bronchiectasis on further assessment.[13] As chronic cough is considered ‘normal’, it tends to be underreported by carers of Aboriginal children.[41] Anecdotally, adult Aboriginal people and Torres Strait Islanders also under-report their cough. In children, triggers for referral to a specialist include:

- >3 episodes of chronic (>4 weeks) wet cough per year responding to antibiotics
- chest X-ray abnormality persisting >6 weeks following appropriate therapy (Box 2).[2]

Frequent exacerbations of bronchiectasis, especially when hospitalisation is required, is a risk factor for lung function decline.[3,42] Thus when exacerbations are frequent (four or more per year non-hospitalised episodes, or two per year hospitalised episodes), consider use of maintenance antibiotics in collaboration with specialists.[1]

Exposure to in-utero tobacco smoke is associated with lower birth weights, increased ARI and other respiratory morbidity.[43,44] Breastfeeding is protective against development of bronchiectasis, while being born premature or small for gestation is a risk factor.[37] Primary prevention strategies to reduce these factors and increase breastfeeding would be beneficial (refer to Chapter 3: Child health). The association between poor hygiene and the excessive burden of infections (especially respiratory and gastrointestinal) has been well demonstrated.[45,46] However, data specific to Aboriginal and Torres Strait Islander peoples as well as evidence-based interventions are sparse[45] (refer also to Chapter 7: Hearing loss).

Recommendations: Bronchiectasis and chronic suppurative lung disease

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/strength of evidence	References
Immunisation	All children and adults, including pregnant women	Ensure timely immunisation is provided	As per National Immunisation Program Schedule (NIPS) and state and territory schedules	IA	1
Screening	People with pneumonia and lower acute respiratory infections(ARIs) (particularly hospitalised episodes)	Ensure primary healthcare providers review the patient after the ARI episode If wet or productive cough* is present, consider the diagnosis of bronchiectasis/ chronic suppurative lung disease (CSLD).‡ Recommence antibiotics and undertake investigations as per management guidelines (refer to 'Resources') or refer to a specialist (Box 2)[1]	3–4 weeks post-episode, then two-weekly until symptoms resolve or the patient is referred	IA (antibiotics efficacy in treatment of wet cough in children) III–IIB (screening for bronchiectasis post–lower ARI episode)	37–39
	People with recurrent lower ARIs (in children, this is >2 episodes of hospitalised chest X-ray proven pneumonia ever), and/or with persistent chronic (>4 weeks) wet cough†	Consider a diagnosis of bronchiectasis. Repeat a chest X-ray Refer children to a specialist if there is persistent wet cough and/or abnormal CXR (Box 2)	Opportunistic	III–II (screening for bronchiectasis post–lower ARI episode) IA (antibiotics efficacy in treatment of wet cough in children) GPP B (for effectiveness of screening and antibiotics in adults)	1, 37, 39, 40, 47
	People with history of tuberculosis	Clinically assess for chronic lung disease symptoms,‡ and undertake spirometry	Opportunistic	III–II	48
	Adults with chronic obstructive pulmonary disease (COPD)	Undertake spirometry (refer to Chapter 9: Respiratory health, 'Chronic obstructive pulmonary disease'). Assess for bronchiectasis symptoms and consider referral to specialist if: • there is a history of daily sputum production • sputum has persistent infection, especially with *Pseudomonas aureginosa* • there are increasing exacerbations • there is lung function decline	Opportunistic	III–II (screening for bronchiectasis in adults with COPD)	7, 8, 49

Recommendations: Bronchiectasis and chronic suppurative lung disease					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/strength of evidence**	**References**
Behavioural	All Infants	Promote and encourage breastfeeding	At postnatal checks	III–IIB (breastfeeding protective)	1, 37
	All children	Promote good hygiene practices to reduce burden of infections (refer to Chapter 7: Hearing loss)	Opportunistic	GPP B	45
	People with CSLD or known bronchiectasis	Assess cough severity, quality of life, and exacerbating factors. Undertake regular review to prevent and manage complications and comorbidities (Box 1)	Three-monthly clinic review Six-monthly specialist review	GPP B	1, 2
	Infants at risk of exposure to environmental tobacco smoke both in-utero and in the postnatal period	Advise and assist pregnant women to avoid smoking (refer to Chapter 2: Antenatal care) Advise parents/carers who smoke about the harms of environmental tobacco smoke and the need to limit childhood exposure, particularly in confined spaces (eg homes and motor vehicles) (refer to Chapter 1: Lifestyle, 'Smoking')	Opportunistic	IIIC	43, 44
	Mothers with, or at risk of having, babies with low birth weights and/or premature infants	Promote increased access to comprehensive antenatal care (refer to Chapter 2: Antenatal care)	Opportunistic	GPP III–IIC (premature and low birth weight infants developing CSLD)	1, 6, 37
	People with CSLD or known bronchiectasis	Consider maintenance antibiotics on discussion with the person's specialist	As per clinical practice guidelines[1]	IA	50, 51
Chemo-prophylaxis					

*Cough is usually underreported.[41]

†Children do not usually produce sputum and hence the term 'wet cough' (rather than 'productive cough') is used.[1]

‡Bronchiectasis refers to symptoms of CSLD in the presence of high-resolution computed tomography (HRCT) chest scan findings of airway dilatation when clinically stable.[2] CSLD is diagnosed when symptoms and/or signs of bronchiectasis are present without availability of an HRCT to confirm bronchiectasis, or, in children, without the HRCT features of bronchiectasis.[2] These symptoms and/or signs are recurrent (>3 episodes) wet or productive cough, each lasting for >4 weeks, with or without other features (eg exertional dyspnoea, symptoms of airway hyper-responsiveness, recurrent chest infections, growth failure, digital clubbing, hyperinflation or chest wall deformity).[2]

Box 1. Reviewing patients who have chronic suppurative lung disease/bronchiectasis[1]

Regular review consists of at least an annual review in adults and six-monthly in children. A multidisciplinary team is preferable, especially at the initial evaluation.

The review includes assessment of:

- severity, which includes oximetry and spirometry
- sputum culture (when available) for routine bacterial and annual mycobacterial culture
- management of possible complications and comorbidities, particularly for gastroesophageal reflux disease/aspiration, reactive airway disease/asthma, chronic obstructive pulmonary disease (COPD), otorhinolaryngeal disorders, urinary incontinence, mental health and dental disease; less commonly, patients require assessments for sleep-disordered breathing and cardiac complications
- adherence to therapies and knowledge of disease processes and treatments.

Box 2. In children, triggers for referral to a specialist[1]

Triggers include one or more of the following:

- persistent wet cough not responding to four weeks of antibiotics
- >3 episodes of chronic (>4 weeks) wet cough per year responding to antibiotics
- a chest radiograph abnormality persisting >6 weeks after appropriate therapy.

Resources

- Thoracic Society of Australia and New Zealand, *Chronic suppurative lung disease and bronchiectasis in children and adults in Australia and New Zealand: Clinical practice guideline,* www.thoracic.org.au/journal-publishing/command/download_file/id/36/filename/TSANZ-ChronicSuppurativeLungDisease-Guidelines-2016-web.pdf
- Menzies School of Health Research, Chronic suppurative lung disease/bronchiectasis (chronic lung sickness) flipchart, www.menzies.edu.au/icms_docs/158417_Chronic_Suppurative_Lung_DiseaseBronchiectasis_Chronic_Lung_Sickness.pdf
- Menzies School of Health Research, Chronic lung sickness (bronchiectasis) flipchart, www.menzies.edu.au/page/Resources/Chronic_lung_sickness_Bronchiectasis

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Chapter 10: Acute rheumatic fever and rheumatic heart disease

Background

'While acute rheumatic fever has become a rare curiosity in Australia's non-Indigenous population, its incidence in Indigenous Australians living in remote areas remains among the highest reported in the world. It is unlikely that such a stark contrast between two populations living within the same national borders exists for any other disease or on any other continent.'[1]

Acute rheumatic fever (ARF) is an illness caused by an abnormal and exaggerated immune response to infection with Group A beta-haemolytic streptococcus (GAS or *Streptococcus pyogenes*). The role of preceding GAS throat infection is undisputed, although preceding symptomatic GAS pharyngitis is infrequently identified in Aboriginal and Torres Strait Islander populations.[2] The role of preceding skin infection in ARF is less certain.[3] Immune priming is possibly important but the exact pathogenic mechanisms remain elusive.[4,5]

ARF remains the commonest cause of acquired heart disease in children worldwide.[6] The community incidence of ARF is a sensitive marker of childhood disadvantage.[1] In Australia and nearby Pacific nations, the incidence of ARF varies widely: children in remote Aboriginal and Torres Strait Islander communities of Northern and Central Australia, Pacific Islanders, Maori people and refugees are in the highest risk groups. In some remote communities, reported prevalence rates of greater than 300 per 100,000 children aged 5–14 years are more than 100 times that of the wider Australian population.[7]

ARF tends to run in families and is slightly more common in females. It has a low incidence rate in wealthier societies.[5] The incidence of ARF peaks in the 5–15-year age group; it occurs endemically in tropical high incidence settings, as opposed to outbreaks that have occasionally been reported in other parts of the world.

Individuals with a first episode of ARF are at high risk of recurrences, especially in the first year; however, this increased risk extends over the next 10 years or so.[8] The concern is that ARF, especially recurrent ARF, leads to rheumatic heart disease (RHD) in a high proportion of people (likely to be >50%).[7] RHD is characterised by cumulative scarring and distortion of heart valves – primarily the mitral and aortic valves. The peak prevalence of RHD is in the 15–35-year age group.[8] Progression causes valve regurgitation, stenosis or both – with a substantial risk of subsequent heart failure, atrial fibrillation, embolic stroke, infective endocarditis, disability and early death. The RHD-attributable mortality rate for Aboriginal and Torres Strait Islander peoples is substantially higher than that for the equivalent non-Indigenous population. ARF and RHD are preventable.

Diagnosis of ARF

ARF is said to 'lick the joints and bite the heart' (Ernest-Charles Lasègue, 1816–83). It is a clinical diagnosis; there are no definitive diagnostic laboratory tests. For more than half century, clinicians relied on the Jones criteria; they were revised in 1992, but still appeared to be too specific for high-risk populations. This prompted development of the Australian guideline[9] and the World Health Organization guideline.[10] However, the most recently revised Jones criteria, from 2015,[11] are again regarded as the Gold Standard. In moderate- to high-risk populations, mono-arthritis, polyarthralgia and subclinical, echocardiographically diagnosed carditis are major criteria (Table 1). There is also the ability to diagnose 'probable ARF', so as to include manifestations that do not satisfy the criteria for definite ARF but for which the clinician feels ARF is the most likely diagnosis. One common-sense diagnostic approach is to suspect ARF in any child with acute fever and joint pain or any child with new onset movement disorder, especially in a high-risk setting, and have a low threshold for consulting an experienced colleague.[12] A further concern is that mild to moderate acute carditis can present without arthritis, particularly with ARF recurrences. This is commonly asymptomatic and, as a consequence, it may go undetected and potentially cause cumulative valve damage.[13]

Table 1. Australian guideline criteria for acute rheumatic fever[9]

	High-risk groups*	All other groups
Initial episode of acute rheumatic fever (ARF)	• Two major **or** one major and two minor manifestations **plus** • Evidence of a preceding Group A streptococcus (GAS) infection†	
Recurrent attack of ARF in a patient with known past ARF or rheumatic heart disease (RHD)	• Two major **or** one major and one minor **or** three minor manifestations **plus** • Evidence of a preceding GAS infection†	
Probable ARF (first episode or recurrence)	A clinical presentation that falls short by either one major or one minor manifestation, or in the absence of streptococcal serology results, but one in which ARF is considered the most likely diagnosis. Such cases should be further categorised according to the level of confidence with which the diagnosis is made: • highly suspected ARF • uncertain ARF	
Major manifestations	• Carditis (including evidence of rheumatic valvulitis on echocardiogram) • Polyarthritis or aseptic mono-arthritis or polyarthralgia‡ • Chorea§ • Erythema marginatum‖ • Subcutaneous nodules	• Carditis (excluding subclinical evidence of rheumatic valve disease on echocardiogram) • Polyarthritis‡ • Chorea§ • Erythema marginatum • Subcutaneous nodules
Minor manifestations	• Mono-arthralgia • Fever ≥38°C# • Erythrocyte sedimentation rate (ESR) ≥30 mm/hr or C-reactive protein (CRP) ≥30 mg/L • Prolonged P-R interval on electrocardiogram (ECG)**	• Fever ≥38°C# • Polyarthralgia or aseptic mono-arthritis‡ • ESR ≥30 mm/h or CRP ≥30 mg/L • Prolonged P-R interval on ECG**

*High-risk groups are those living in communities with high rates of ARF (incidence >30 per 100,000 per year in 5–14-year-olds) or RHD (all-age prevalence >2 per 1000). Aboriginal and Torres Strait Islander peoples living in rural or remote settings are known to be at high risk.

†Elevated or rising anti-streptolysin O (ASO) or other streptococcal antibody, or a positive throat culture or rapid antigen test for GAS. The ASO must be interpreted according to age and the background 'streptococcal burden' of the community.

‡A definite history of arthritis is sufficient. Other causes of arthritis/arthralgia should be carefully excluded.

§Rheumatic (Sydenham's) chorea does not require other manifestations or evidence of preceding GAS infection, provided other causes of chorea are excluded.

‖Erythema marginatum is a distinctive rash. Care should be taken not to label other rashes, particularly non-specific viral exanthemas, as erythema marginatum.

#Oral, tympanic or rectal temperature ≥38°C on admission or documented during the current illness.

**Note that if carditis is present as a major manifestation, prolonged P-R interval cannot be considered an additional minor manifestation in the same person.

Clinicians may not always appreciate the distinction between the two most common forms of the illness. Table 2 outlines the differences between the acute febrile illness with joint manifestations and, often, carditis; and the neurological/behavioral disorder, which often also has accompanying carditis. Clinicians should also be aware that erythema marginatum and subcutaneous nodules are both rare manifestations of ARF.

Table 2. Clinical manifestations of acute rheumatic fever

Acute febrile illness	Neurological illness (25–30%)
• Onset: 2–4 weeks after Group A streptococcus (GAS) infection • Fever is common • Acute joint symptoms and signs • Carditis: clinical and subclinical • Skin manifestations and subcutaneous nodules – these are rare • Raised inflammatory markers (C-reactive protein, erythrocyte sedimentation rate) • Evidence of preceding GAS infection (anti-streptolysin O [ASO] and anti-DNase B) • Dramatic symptomatic response to aspirin and non-steroidal anti-inflammatory drugs • Duration: usually <6 weeks • The clinical features of recurrent acute rheumatic fever may be less prominent	• Later onset: 2–6 months after GAS infection • Most common in females aged 10–24 years • No fever • Often occurs as isolated manifestation: joint manifestations are usually **not** a feature • Distinctive chorea and behavioural disorder • Carditis > 30%: often subclinical • Often normal inflammatory markers • Because may occur as delayed manifestation, ASO and anti-DNase B not helpful • Duration ≥3 months, with later recurrence ~30% • Followed by rheumatic heart disease in ~50%

The neurological illness (Sydenham's chorea) is more common in girls and sometimes presents as refusal to go to school and self-isolation. The movement features of chorea can be subtle and intermittent, unilateral or bilateral, sometimes being seen only after a period (10–15 minutes) of quiet observation. The chorea disappears during sleep. Shame and embarrassment are common concerns for these children. They can also have halting and jerky speech patterns – this causes more embarrassment. Inappropriate behaviour occasionally includes obsessive-compulsive features.[9]

As mentioned, timely diagnosis of ARF at the time of presentation is critical and a high index of suspicion is needed, especially in populations at high risk. If ARF is suspected, immediate management steps include the following:

- obtain a second expert opinion, usually by telephone
- arrange admission to hospital within 24 hours, if possible
- take a careful history, including a family history, and conduct a thorough physical examination
- arrange ECG, mainly to check P-R interval (this is age dependent), and take a throat swab for GAS culture
- take blood for baseline streptococcal serology (anti-streptolysin O [ASO] and anti-DNase B) and inflammatory markers (erythrocyte sedimentation rate and C-reactive protein)
- administer intramuscular benzathine penicillin G (also called Bicillin LA) according to protocol with the aim of eradicating GAS from the throat
- do not give aspirin or non-steroidal anti-inflammatory drugs immediately; the in-hospital observed response to these medications is diagnostically helpful. Give paracetamol for pain relief.

The final diagnosis of ARF should only be made by a specialist clinician with substantial experience in the diagnosis of ARF and/or in consultation with such a clinician.[9]

Diagnosis of RHD

The diagnosis of RHD usually occurs in one of three ways:

1. Presentation with symptoms – cardiac (most common) and/or neurological (stroke, endocarditis). This indicates advanced disease.
2. Finding a heart murmur or signs of rheumatic valve disease on routine examination, incidentally and/or by echocardiography for another matter. The person is often asymptomatic.
3. Case detection as part of a RHD screening program. Such individuals are usually asymptomatic and may have no discernible heart murmur.

Any person with suspected or proven RHD must be immediately referred, initially by telephone, to a specialist service for assessment if any of the following are detected:

- symptoms, particularly exertional dyspnoea
- untreated atrial fibrillation
- fever
- a recent neurological event
- current pregnancy (remember to test).

Echocardiography provides a definitive diagnosis of RHD and this may take some time to organise for people in remote settings. The World Heart Federation has now developed standardised and evidence-based criteria.[14]

Interventions

Preventing and treating ARF and RHD

A common strategy is to implement complementary interventions at each level of the preventive health spectrum.[9]

Primordial prevention refers to addressing social determinants of health such as adequate housing, education and employment. Ultimately, primordial prevention is the only sustainable way to prevent ARF and RHD.[1,15]

Primary prevention: Treatment of streptococcal pharyngitis with penicillin is effective in some controlled temperate-climate settings (eg the US military) but has largely been unsuccessful in poorly resourced, high-risk populations. This may be because a preceding symptomatic GAS pharyngitis is less likely to present to the community health service.[3] Despite a lack of clear evidence of effectiveness in remote Aboriginal and Torres Strait Islander communities, treating symptomatic pharyngitis in high-risk populations with intramuscular benzathine penicillin G is currently recommended.[16] Oral phenoxymethyl penicillin V for 10 days is a second-line alternative but is not preferred. Some innovative nurse-led, school-based strategies for primary prevention have recently been proposed, especially in New Zealand, and may stimulate renewed interest in this approach, although they are expensive and their effectiveness in Australian settings is yet to be demonstrated.[17,18] Healthy skin programs in remote communities aimed at reducing community prevalence of scabies and impetigo have had challenges of sustainability.[19] The production and distribution of an effective vaccine is not likely to be available for many years.

Secondary prevention through ARF/RHD control programs: These are aimed at reducing recurrent ARF in people with known previous ARF or established RHD.[20] Register-based programs endeavour to provide intramuscular benzathine penicillin G prophylaxis every 21 to 28 days for 10 years or more. Oral antibiotics are much less effective and not recommended for first-line use in prophylaxis.[9] A comprehensive primary healthcare approach is key to effective service delivery of this treatment. ARF/RHD prevention programs also advocate regular clinical follow-up and echocardiograms, routine vaccinations,[21] dental care, family planning advice and endocarditis prophylaxis.[9,22] Delivery of effective secondary prophylaxis in remote settings has proven to be extremely challenging, especially in those communities at highest risk of ARF/RHD.[23–26] A stepped-wedge randomised control trial of a multifaceted intervention to address barriers to effective control programs is currently underway in the Northern Territory.[27]

Several recent studies have investigated the role of echocardiographic screening for RHD in asymptomatic children. The rationale is that routine screening identifies children with previously undetected disease, including a substantially large group of children with ‘subclinical’ valvular changes.[28–30] However, there is still no universally accepted approach to the interpretation and management of minor valvular changes and there are substantial resource limitations. Routine screening is yet to be widely advocated in Australia.[29,31]

As part of a coordinated control program, a structured care plan is recommended for all people with a history of ARF or established RHD based on a priority classification as outlined in Box 1.[9]

Tertiary prevention: This involves the treatment of people with established RHD and includes treatment of cardiac failure, cardiac dysrhythmias, other complications of RHD, and cardiac interventions including surgery, rehabilitation and long-term post-surgical anticoagulation. These topics are outside the scope of this chapter.

Practical considerations for clinical care

Practical considerations include the following.

- Where ARF and/or RHD are notifiable conditions, clinicians should notify the relevant state and territory health authorities when they newly identify a patient with ARF or RHD.
- Where there is an established regional and community register-based ARF/RHD prevention program, all patients should be included in the register and all subsequent related clinical 'events' and follow-up contacts recorded to keep it updated. This enables the register to function as a valuable, real-time clinical tool.[32]
- Clinicians should recognise that minimising the stress and pain of prophylaxis injections is a key factor in people returning regularly.[33] Administration of benzathine penicillin G requires proper training and experience (refer to 'Resources') and should not be performed by inexperienced or transient staff.[26]
- Most people receiving secondary prophylaxis injections will be pre-teens, adolescents and young adults. Managing a chronic disease in this group requires special insight, patience and perseverance on the part of health professionals. Because most young people on an ARF/RHD program will be asymptomatic and prophylaxis is painful and frequent, extra attention to continuity of care is a critical component of a successful prevention program.[26,33,34] (Refer to Chapter 4: The health of young people.)
- Clinics may need to take a flexible approach to where injections are administered (eg clinic, home, clinic vehicle, school, opportunistic)[33] and arrange clinical 'fast tracking' for young people who are attending clinic for their injections to reduce wait times.
- Wherever possible, services such as echocardiography, specialist review and dental care should be provided in the community rather than having people travel, often long distances, to city-based tertiary care centres. People at highest risk of recurrent ARF/RHD are also often at increased risk of experiencing difficulties when travelling to a major centre. The reasons for this are multifactorial; people 'coming to town' must navigate a complex health system. They may also face culture shock, separation from family, strange surroundings, strange faces, perplexing paperwork, incomprehensible rules, complicated instructions, uncomfortable waiting rooms, transport misunderstandings, plus unfamiliar food and accommodation.
- In clinical practice, true penicillin allergy is rare.[35] If the label 'penicillin allergy' is in the clinical chart, it is important to invest additional effort to verify the type and severity of the allergic reaction as many reactions are mild, such as nausea or local injection irritation. Given a lack of prophylaxis can have disastrous sequelae, referral to an allergist or immunologist is recommended to determine if there is an absolute contraindication to penicillin.
- Women of child-bearing age with known RHD who are taking anticoagulant medication for any reason require specialist family planning advice and careful follow-up because of the potential increase in medication-related fetal anomalies.[9]
- ARF/RHD prevention programs sometimes refer to 'monthly', '4-weekly' or 'moon-cycle' injections, but these are variably interpreted and can lead to inconsistent administration regimes. It is essential to emphasise that all prophylaxis injections must be given within a 21–28-day period. From the 29th day onwards, these are 'days at risk'.[36]
- A continuous quality improvement approach at the primary care level is recommended.[37]

- A secondary prophylaxis program will also include regular GP and specialist review (physician, cardiologist and/or paediatrician), serial echocardiography to assess possible progression of valve disease, dental review as part of endocarditis prevention, influenza and pneumococcal vaccinations plus family planning advice for women of reproductive age. The program should provide ongoing family education and support.[9]
- People having ARF/RHD secondary prophylaxis (and/or a responsible family member or carer) can be given a laminated card with relevant details of their treatment to assist with administration of prophylaxis when outside their community.
- Regular mobile phone text message reminders for benzathine penicillin G injections have been used in some community clinics with good results (Marea Fittock, RHDAustralia, personal communication, March 2017), although this has not been formally evaluated and might not be acceptable or effective for everyone.
- Addressing language and communication barriers is core to successful programs. As mentioned, continuity of care is an important factor, and this is best achieved through community-based health workers.[34]
- The language used by healthcare providers is also important. Because ARF is a sensitive marker of childhood disadvantage, the highest risk settings are frequently households with difficulties of overcrowding, poverty, poor health literacy, unemployment and day-to-day domestic chaos. The consistent delivery of high-quality health services to this population poses many challenges for affected individuals, families and health service personnel. Terms such as ‘adherence’ or ‘compliance’ to treatment have implicit value judgements and are therefore best avoided.

Policy considerations for delivery of successful ARF/RHD control programs

Policy considerations include the following.

- Secondary prophylaxis for ARF/RHD is a complex and demanding endeavour and should be provided within the framework of a formal register-based ARF program – preferably sited within a state or territory health system.[32]
- An ARF/RHD prevention program should be guided by a steering (or advisory) committee with strong representation from practising clinicians experienced in the day-to-day management of ARF/RHD and from community representatives. The steering group should have clear goals and meet regularly to provide advice to program staff on priority activities, develop policy, publish new developments and report outcomes to clinicians and government.
- An ARF/RHD prevention program should focus on reporting outcomes such as new cases of ARF, and recurrences; hospitalisations for conditions such as cardiac failure, stroke and endocarditis; cardiac interventions, including surgery; complications of cardiac interventions; and all-cause mortality. Appendix 3 of the Australian guideline provides a set of key performance indicators for ARF/RHD that cover these issues in more detail.[9] In addition to reporting process measures such as numbers of injections administered, it is essential to provide data on real health outcomes to deliver a true assessment of program achievement.
- The ARF/RHD register must be updated in real time for it to be clinically useful. As such, all relevant practising clinicians (doctors, nurses, health workers, allied health professionals) in both the government and the Aboriginal Community Controlled Health Service sectors should have password-protected online access to the register.[38]
- Generally, routine secondary prevention is best provided in primary healthcare settings rather than by tertiary care organisations and hospital-based consultant specialists. However, communities with the highest incidence of ARF also experience a high turnover of medical and nursing staff. Thus, resident primary healthcare staff, particularly Aboriginal and Torres Strait Islander health workers, must be appropriately skilled and have ongoing training to maintain their skills. With a properly supported workforce, the vast majority of secondary prophylaxis can be delivered by local Aboriginal and Torres Strait Islander health workers.[33,38]

- From the outset, strong community engagement to identify the optimal ways to deliver each community's ARF/RHD prevention service is essential to enhance its effectiveness and sustainability. Communities should be regularly informed of the program's outcomes, and interventions to enhance the health literacy of people with ARF/RHD and their families is an essential and ongoing task.

Recommendations: Acute rheumatic fever and rheumatic heart disease

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Immunisation	People with a history of acute rheumatic fever (ARF) or known rheumatic heart disease (RHD)	Administer routine childhood and adult vaccinations plus annual influenza vaccination as per the National Immunisation Program Schedule (refer also to Chapter 3: Child health) Provide pneumococcal vaccination	As per national guidelines	II	9
Screening	Individuals coming from high-risk groups or living in high-risk settings for ARF/RHD All pregnant women	Take a comprehensive medical history, and family history for cardiovascular disease Cardiac auscultation to screen for RHD is not recommended due to poor sensitivity and specificity. The diagnosis of RHD must be made by echocardiography Echocardiography is not currently recommended for population-based screening for RHD	Opportunistic and as part of routine health assessment	GPP	9
	All individuals with a past history of ARF, or cardiac murmurs suggestive of valve disease	Refer for echocardiography and subsequent follow-up. Refer to management guidelines for specific advice	As per management guidelines	GPP	9
Behavioural	People with a past history of ARF or known RHD	Emphasise the importance of early treatment for sore throat and prevention of skin infections (refer to Chapter 3: Child health, 'Childhood kidney disease') Advise about healthy lifestyle (smoking, diet, exercise, dental health) and the need for regular clinical reviews (refer to Chapter 1: Lifestyle, and Chapter 8: Oral and dental health) Offer contraceptive advice to females of child-bearing age in order to avoid unintended pregnancy (refer to Chapter 4: The health of young people) Provide community-based health promotion about ARF/RHD	Opportunistic and annually	GPP	39

Recommendations: Acute rheumatic fever and rheumatic heart disease					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	All people in high-risk communities where Group A streptococcus (GAS) infections are common and ARF is prevalent	Maintain a high index of clinical suspicion of streptococcal pharyngitis in people presenting with a sore throat Take a throat swab to confirm a diagnosis of streptococcal pharyngitis and consider empirical treatment with single-dose intramuscular benzathine penicillin G or the less-preferred option of 10 days of oral penicillin V while awaiting test results	As presented	GPP	39
	All people with confirmed GAS pharyngitis	Treat as above There is no evidence to support treating family contacts of those with GAS pharyngitis	As presented	IA	40
	All people with ARF/RHD	A new diagnosis of ARF or RHD should be notified to the communicable disease control unit in jurisdictions where these conditions are notifiable diseases Recommend long-term prophylactic antibiotics (either benzathine penicillin every 21–28 days or the less-preferred option of daily oral penicillin V) for the prevention of recurrent rheumatic fever attacks Explain the importance of long-term antibiotics to both the affected individual and their family/carers Include patient details in local patient information or medical record recall systems and, with consent, send details to the ARF/RHD centralised register	Opportunistic and as presented	GPP	9
		Categorise patients according to the severity level of their disease (priority levels 1–4) (Box 1). This is necessary to plan the review and follow-up frequency tailored to patients	As per individual recall plan	IA	9
	People with established RHD	Provide antibiotic prophylaxis for dental and other high-risk procedures	As required	GPP	22
Environmental	People living in communities where GAS infections are common and ARF is prevalent	Assess for overcrowding and refer to social support services for housing assistance if indicated (refer also to Chapter 7: Hearing loss) If high rates of impetigo and underlying scabies, manage as per local healthy skin guidelines (refer to 'Resources')	Opportunistic	IIIB	41

Box 1. Priority classifications for developing management plans[9]

Classification	Criteria
Priority 1 (severe)	People with any of the following: • severe valvular disease • moderate or severe valvular lesion with symptoms • mechanical prosthetic valves, tissue prosthetic valves and valve repairs including balloon valvuloplasty
Priority 2 (moderate)	Any moderate valve lesion in the absence of symptoms and with normal LV function
Priority 3 (mild)	ARF with no evidence of rheumatic heart disease (RHD), **or** trivial to mild valvular disease
Priority 4 (inactive)	Patients with a history of acute rheumatic fever (ARF; no RHD) for whom secondary prophylaxis has been ceased
For more detailed information on specific management plans for each priority area, consult RHD Australia guidelines (refer to 'Resources')[9].	

Resources

- Department of Health, Northern Territory, *Healthy skin program: Guidelines for community control of scabies, skin sores, tinea and crusted scabies in the Northern Territory*, http://digitallibrary.health.nt.gov.au/prodjspui/bitstream/10137/698/1/Healthy%20Skin%20Program%202015.pdf
- RHD Australia, *The Australian guideline for prevention, diagnosis and management of acute rheumatic fever and rheumatic heart disease (2nd edition)*, plus phone apps and other resources, www.rhdaustralia.org.au/arf-rhd-guideline
- RHD Australia, handy tips on administration of benzathine penicillin prophylaxis, www.rhdaustralia.org.au/administering-bicllin

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Chapter 11: Cardiovascular disease prevention

Background

In this chapter, 'cardiovascular disease' (CVD) is a collective term that includes coronary heart disease, stroke and transient ischaemic attacks and peripheral vascular disease. Despite improving trends, CVD remains Australia's biggest killer, accounting for 16% of the total disease burden, and is a major driver of national health system expenditure.[1] Aboriginal and Torres Strait Islander peoples experience around five times greater vascular disease burden than other Australians.[2–4] This vascular disease burden rises sharply from early adulthood. Although declining overall, mortality rates from coronary heart disease for Aboriginal and Torres Strait Islander people aged >25 years are twice as high as for the general population, and for those aged 40–54 years it is seven times higher than for the general population.[2–4] CVD is the biggest contributor to the disease burden gap between Aboriginal and Torres Strait Islander peoples and non-Indigenous people in Australia.[3,5]

Based on the Australian Aboriginal and Torres Strait Islander Health Survey (AATSIHS), approximately one in eight (13%) of Aboriginal and Torres Strait Islander people aged >2 years reported heart and/or circulatory diseases (including elevated blood pressure [BP]) in 2012–13.[6] Over three successive surveys since 2000, the prevalence of self-reported heart and circulatory disorders has been rising in remote areas compared to non-remote areas (18% versus 11% in 2012–13).[6] The 2012–13 National Aboriginal and Torres Strait Islander Health Measures Survey (NATSIHMS) is a sub-component of the overall AATSIHS, and includes nationally representative data for biomedical and physical measurements for 3293 people aged ≥18 years.[7] It found that 65% of people had at least one risk factor for CVD, 18% had signs of chronic kidney disease (CKD) based on the presence of albuminuria and/or reduced estimated glomerular filtration rates (eGFR), and 11.1% had diabetes based on either a current diagnosis or a new diagnosis based in turn on biomedical test results.[7] Targeting the risk factors associated with these conditions represents the 'best buy' in terms of preventive health opportunities. Reductions in the prevalence of seven risk factors (tobacco smoking, high body mass, physical inactivity, high blood cholesterol, excessive alcohol intake, high BP, low fruit and vegetable intake) are the most effective prevention strategies in closing the vascular disease burden gap for Aboriginal and Torres Strait Islander peoples.[3,4]

Absolute risk approach to CVD prevention

Estimating the risk of CVD events requires simultaneous assessment of several risk factors. Based on large-scale epidemiological studies, there has been a fundamental shift away from screening and managing single risk factor abnormalities (eg hypertension or hypercholesterolaemia, in which arbitrary cut-points are used for defining presence or absence of a condition) toward a global assessment of multiple risk factors to determine a person's overall or 'absolute' risk of experiencing a cardiovascular event. This approach provides greater ability to predict who is at greatest risk of a first CVD event than the traditional single risk factor approach.[8–11] Another important advantage of this approach is the ability to make accurate, treatment-relevant classifications of risk, thus focusing risk reduction efforts on the people who are most likely to benefit, while avoiding treatment for those likely to receive little risk reduction benefit.[12]

International evidence on CVD risk estimation

Several authoritative guidelines recently published have addressed the issue of CVD risk prediction for primary prevention.[13–18] All of these guidelines are highly consistent in recommending an approach based on absolute risk, usually combined with recommendations for management of single risk factors at the extremes. The methods to estimate risk and the thresholds for defining high risk vary greatly. Box 1 provides a summary of the equations most commonly used internationally. Generally, these equations tend to perform similarly, particularly when the population to which they are applied is similar to that from whom the equations were derived. This issue is particularly important for Australia, as there are currently no Aboriginal and Torres Strait Islander population-specific risk prediction equations. Although research is underway to address this limitation, the 2012 National Vascular Disease Prevention Alliance (NVDPA) and the 2016 National Heart Foundation guidelines currently recommend the 1991 Anderson Framingham Risk Equation (FRE) for risk estimation in Australia.[19,20] This equation should only be applied for people **without** established CVD. Although it outperforms single risk factor approaches, there are some limitations in its application to Aboriginal and Torres Strait Islander populations:

- The FRE is validated for the age range 30–74 years only.
- It may underestimate risk in populations where local risk factor prevalence rates and CVD incidence exceed that of the original Framingham cohort.
- In areas where there is a high prevalence of additional risk factors that are not part of the FRE but are known to be independently associated with CVD, risk may be underestimated.

Non-FRE risk factors of known high prevalence in Aboriginal and Torres Strait Islander communities include family history of premature CVD, elevated body mass index (BMI), markers of CKD, socioeconomic hardship, depression and psychosocial stress, and impaired fasting glucose.[7] Studies from the Tiwi Islands[21] and North Queensland have demonstrated that the relative risk underestimate of FRE may be as great as 30%.[22]

Further, literature reviews conducted by the NVDPA have identified several clinical conditions that, if present, confer a high degree of risk regardless of the risk estimate using the FRE. Box 2 lists the FRE risk factors, additional risk factors for CVD that do not feature in the FRE, and a list of clinically high risk conditions for which absolute risk calculation can be assumed to be high.[20]

The role of additional tests in assessment of CVD risk

In addition to the FRE and non-FRE risk factors, a large number of tests have been proposed to further refine cardiovascular risk assessment. Most of these tests are not rebated under the Medicare Benefits Schedule (MBS) and are **not** routinely recommended for CVD risk screening.[23] They may have a limited role in guiding management decisions for people at moderate CVD risk in primary prevention, but they should **never** be used in secondary prevention as all therapies are indicated irrespective of the results. Some of the most commonly mentioned tests are summarised below.

Coronary artery calcification (CAC) scores: Measurement of CAC using multi-detector computed tomography (CT) scanning uses a low dose of radiation to examine calcium content in artery walls, which is correlated with burden of atheroma. It does not directly measure artery obstruction (CT coronary angiography attempts to do this, but at much higher radiation doses and uses intravenous contrast), and can miss significant non-calcific atheroma. There is no evidence to justify routine screening with this test at present.[24] The Cardiac Society of Australia and New Zealand has suggested there may be a role for this test in guiding treatment decisions for people at intermediate risk, where a high CAC score may reclassify someone to a higher risk status, while a zero or low CAC score indicates low probability of disease.[24]

Ankle Brachial Pressure Index (ABPI): ABPI is a measure of the relative pressures in lower and upper limbs, with a ratio of <0.9 being diagnostic of peripheral artery disease. High readings of >1.4 are also of potential concern as they are often associated with calcified, non-compressible arteries observed in peripheral artery disease. Although the presence of peripheral artery disease is significantly correlated with coronary and cerebrovascular disease, there is currently insufficient evidence to recommend routine population screening.[25] If, however, this test is performed for clinical reasons and shows an abnormal ABPI, this should trigger a plan for lowering all reversible CVD risk factors, taking the same approach as for people identified at high CVD risk.

High-sensitivity C-reactive protein (hsCRP): C-reactive protein (CRP) is a non-specific inflammatory marker produced mainly by the liver in response to inflammatory cytokines. In the absence of acute inflammation, the levels in healthy persons are below the usual test thresholds of about 3 mg/L, so an hsCRP test is used, which has a detection limit around 0.3 mg/L, which is necessary for CVD risk stratification. Although many epidemiological studies show a correlation between CRP levels and risk of first or recurrent cardiovascular events, a meta-analysis has shown that measurement of hsCRP in addition to standard risk scoring would result in the prevention of one CVD event over 10 years for every 400–500 people screened, which makes this test difficult to justify as a standard screening test.[26]

Twenty-four–hour ambulatory BP: Ambulatory BP monitoring involves measuring BP at regular intervals over a 24-hour period while patients undergo normal daily activities, including sleep. Ambulatory BP measurement may be a useful method for diagnosing 'white coat' BP elevation, identifying 'masked' BP elevations that are not apparent on clinic measurements, and for treatment monitoring. It does not, however, play a major role in the assessment of CVD risk.[27] Risk prediction equations are generally derived using office-based readings, and although ambulatory readings tend to be around 5 mmHg lower than clinic measures, this tends not to make a substantial difference to overall risk estimates given BP is just one of many risk factors used to assess risk.

Absolute CVD risk profile in Aboriginal and Torres Strait Islander communities

Using data from the NATSIHMS, the absolute risk profile for Aboriginal and Torres Strait Islander communities has recently been estimated using the NVDPA approach. It found that 9.6% of the sample aged 35–74 years with available data had prior CVD, and a further 15.7% were at high risk of CVD. Importantly, 1.1% and 4.7% of those in the age groups 18–24 years and 25–34 years respectively were also found to be at high risk of CVD (unpublished data). A major driver for being assessed at high CVD risk was the presence of clinically high-risk conditions (in particular, diabetes and age >60 years; diabetes and albuminuria). This pattern was similarly seen in a large primary care data set collected as part of a randomised controlled trial that included over 8000 Aboriginal and Torres Strait Islander people attending Aboriginal Community Controlled Health Services.[28]

Given the high prevalence of these clinically high-risk conditions and the early age at which they occur, a comprehensive vascular risk assessment of all risk factors (Box 2) is recommended from age 18 years. Further, because the FRE substantially underestimates risk in remote communities and there is a high likelihood that it will also underestimate risk in non-remote settings given the higher disease incidence and risk factor prevalence rates, the Central Australian Rural Practitioners Association (CARPA) and the National Heart Foundation have recommended a 5% loading to the FRE score.[29,30] This aligns with approaches taken for Māori and Pacific populations in New Zealand.[31]

Consequently, there are three recommended options to estimate risk for Aboriginal and Torres Strait Islander populations:

1. The NVDPA approach using a combination of the FRE and default clinically high-risk conditions (Box 2).
2. The NVDPA approach plus a 5% absolute risk loading to the FRE scores for those without clinically high-risk conditions (CARPA approach – refer to 'Resources').[29]
3. Use of recalibrated equations or new equations derived from local population data. There are research groups working on both recalibrating the FRE with local population data and deriving new, population-specific risk prediction equations using Aboriginal and Torres Strait Islander–specific cohort data. These equations may provide alternative options for risk prediction purposes in the future.

Regardless of the approach taken, it should be noted that, given the heterogeneity of Aboriginal and Torres Strait Islander populations in Australia, it is likely that no single equation will be appropriate for everyone. A judicious clinical assessment will therefore involve both use of an appropriate risk prediction equation **and** tailored risk assessments that take into account an individual's specific circumstances (clinical, psychological and socioeconomic).

Interventions

Although there is substantial work needed to improve the evidence base for absolute risk-based screening and management for Aboriginal and Torres Strait Islander peoples, the following recommendations have been made. For a detailed appraisal of the evidence base for medication recommendations, please consult the source guidelines in the reference list. Recommendations are provided for people without CVD in the first table and recommendations for those with established CVD are provided in the second table.

Recommendations: Cardiovascular disease prevention

Recommendations for people without an established diagnosis of cardiovascular disease					
Prevention intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	People aged 12–17 years	Assess smoking status, physical activity, nutrition, body mass index (BMI) and waist circumference (refer to Chapter 1: Lifestyle) Advise lifestyle risk reduction accordingly (refer to Chapter 1: Lifestyle)	Opportunistic and as part of annual health check	GPP	3, 6, 7
	People aged 18–29 years without any vascular risk factors	Assess smoking status, physical activity, nutrition, BMI, and waist circumference Also assess blood pressure (BP), family history of premature cardiovascular disease (CVD) (particularly in a first-degree relative aged <55 years), diabetes risk (refer to Chapter 12: Type 2 diabetes prevention and early detection), psychosocial risk factors (refer to Chapter 17: Mental health) and socioeconomic risk factors Advise lifestyle risk reduction accordingly (refer to Chapter 1: Lifestyle)	Opportunistic and as part of annual health check	GPP	3, 6, 7
	People aged 18–29 years with one or more of the following present: • family history of premature CVD • chronic kidney disease (CKD) • overweight/ obesity • smoking • diabetes • elevated BP	Assess risk factors as above* Also assess serum lipids and screen for CKD (refer to Chapter 13: Chronic kidney disease prevention and management) Advise lifestyle risk reduction accordingly (refer to Chapter 1: Lifestyle)	Opportunistic and as part of annual health check	GPP	3, 6, 7, 29, 32
	People aged 30–74 years†	Assess for the presence of any Framingham or non-Framingham risk factors and clinically high-risk conditions (Box 2) If no clinically high-risk conditions present, calculate absolute five-year CVD risk using the Framingham Risk Equation (FRE) (Appendix A: Australian cardiovascular risk charts)	As part of a health assessment and review according to level of risk (refer below)	IA	8–11, 20, 30

Recommendations for people without an established diagnosis of cardiovascular disease					
Prevention intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	People aged 30–74 years in communities where local risk factor prevalence rates and CVD incidence rates are high (eg remote areas)	When using the FRE, consider adding 5% to the calculated five-year CVD risk score‡	As part of a health assessment and review according to level of risk (refer below)	GPP	29, 31
	People aged 30–74 years	There is insufficient evidence to recommend routine CVD risk screening with additional tests such as coronary artery calcium scores, C-reactive protein, Ankle Brachial Pressure Index (ABPI), 24-hour ambulatory BP monitoring. Such tests may have some use in people identified at intermediate risk, and the decision to conduct these tests should be based on clinical judgement§		IA	23–27
Behavioural	People with low absolute five-year CVD risk (<10%)	Advise lifestyle risk reduction as needed for the following (refer to Chapter 1: Lifestyle): • physical activity • weight loss • smoking cessation • salt reduction to less than 4 gm salt/ day (1600 mg sodium/day) • diet rich in fruit and vegetables, whole grain cereals, nuts and seeds, legumes, fish, lean meat, poultry, low-fat dairy products, and limiting saturated and trans fat intake • limit alcohol intake to ≤2 standard drinks/day	Review risk every two years	IA	13–5, 18, 20, 30, 31
	People with the following: • absolute five-year CVD risk moderate or high (≥10%) • presence of any clinically high-risk conditions (Box 2)	Advise lifestyle risk reduction as above Provide intensive intervention support (refer to Chapter 1: Lifestyle)	Review according to clinical context	IB	13–15, 18, 20, 30, 31

Recommendations for people without an established diagnosis of cardiovascular disease					
Prevention intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	People at low absolute risk: <10% five-year CVD risk and with BP persistently ≥160/100 mmHg	Consider commencing a BP-lowering medication unless contraindicated	Review according to clinical context	GPP	10, 30, 33
	People at moderate absolute CVD risk: 10–15% five-year CVD risk	Review individual risk factor profile (in particular, sub-optimal BP and lipids levels) and recommend commencing BP-lowering treatment and/or lipid-lowering medication unless contraindicated[ll]	Review according to clinical context	IB	10, 11, 15–18, 20, 30, 31
	People at high absolute CVD risk: >15% five-year CVD risk or presence of any clinically high-risk conditions (Box 2)	Recommend commencing both a BP-lowering medication and lipid-lowering medication regardless of risk factor levels unless contraindicated[ll]	Review according to clinical context	IB	10, 11, 15–18, 20, 30, 31
		Aspirin is not routinely recommended for primary prevention of CVD[#]		IB	20
	Patients with atrial fibrillation (AF) without prior CVD	Determine the cause of AF and manage rate and rhythm control. Assess and manage CVD risk as above. Consider oral anticoagulant treatment if: • valvular heart disease is present or • a CHA2DS2-VASc score of ≥2 (Box 3) is present and • risk of bleeding is low		IA	34, 35

*Although absolute CVD risk assessment using the FRE is currently not validated for people aged <30 years, a multifactorial assessment of CVD risk factors is still recommended to guide management decisions. Treatment on the basis of elevated single risk factors may still be appropriate depending on the clinical context.

†Although the FRE is validated for people aged 30–74 years, the Australian absolute risk charts start from age 35 years. Some calculators embedded in clinical software and the CARPA charts (refer below) can be used to assess risk in those aged 30–34 years.

‡It is important to distinguish between absolute and relative risk increase. While the absolute risk remains constant at 5%, the relative risk increase will vary depending on the baseline risk. For example, if the initial risk estimate is 5%, an absolute increase of 5% equates to a 100% relative risk increase. If the initial risk estimate is 10%, an absolute increase of 5% equates to a relative risk increase of 50%. If the initial risk estimate is 15%, an absolute increase of 5% equates to a relative risk increase of 33%.

§At the time of writing, there are no Medicare Benefits Schedule rebates for coronary artery calcium scores, highly sensitive C-reactive protein, or 24-hour ambulatory BP monitoring.

llSpecific choice of BP and lipid-lowering agents and guidelines on treatment targets is beyond the scope of this guideline. In general, however, low-dose dual BP therapy is preferred as first-line therapy because treatment effects are at least as beneficial and tolerance is greater than when using higher dose single-agent treatment. Refer to 'Resources' for links to specific management guidelines. If BP or lipid levels are extreme or non-responsive to treatment, further investigation for underlying causes is recommended.

#The US Preventive Services Task Force makes a level IB recommendation for the use of aspirin in people aged 50–59 years at moderate to high CVD risk for the primary prevention of CVD and colon cancer if there is no increased risk of bleeding.[36] This is not currently recommended in Australian guidelines, and clinical judgement is recommended in making decisions for aspirin use. Further trials are currently underway to more comprehensively understand the risks and benefits of aspirin in primary CVD and cancer prevention (refer also to Chapter 15: Prevention and early detection of cancer).

Recommendations for people with an established diagnosis of cardiovascular disease					
Prevention intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	People with CVD	Calculation of the absolute CVD risk using the FRE is not recommended. Five-year risk of a subsequent CVD event is assumed to be high			
Behavioural	People with CVD	Intensive lifestyle risk factor management as for patients without an established diagnosis of CVD (refer to 'Recommendations for people without an established diagnosis of cardiovascular disease [CVD]')	Review at every visit	IB	37, 38
		A tailored cardiac rehabilitation program should be offered to all people post–myocardial infarction and other acute coronary syndromes, and to those who have undergone re-vascularisation procedures	Post-CVD event	IA	39
Chemo-prophylaxis	People with CVD	Commence blood pressure (BP)-lowering treatment if systolic BP is >120–130 mmHg unless contraindicated by symptomatic hypotension*	Lifelong	IA	38, 40
		Commence lipid-lowering treatment with a statin at any cholesterol level unless contraindicated*	Lifelong	IA	38, 41
		Commence low-dose aspirin treatment (75–150 mg) unless contraindicated. Consider alternative antiplatelet agents such as clopidogrel (75 mg) if aspirin hypersensitivity is present For people with ischaemic stroke combination, aspirin/dipyridamole may also be considered	Lifelong	IA	38, 42, 43
	People with recent acute coronary heart disease	Recommend dual antiplatelet therapy (clopidogrel or ticagrelor) in combination with aspirin	For 12 months	IA	38, 42, 43
	People with stroke/ transient ischaemic attack	Oral anticoagulant treatment is recommended if atrial fibrillation or cardio-embolic stroke is present unless contraindicated. Consultation of specific management guidelines is recommended (refer to 'Resources')	Lifelong	IA	34, 35, 38

*Specific choice of BP and lipid-lowering agents and guidelines on treatment targets is beyond the scope of this guideline. Refer to 'Resources' for links to specific management guidelines. If BP or lipid levels are extreme or non-responsive to treatment, further investigation for underlying causes is recommended.

Box 1. Commonly used international risk prediction equations[13]

	Framingham	SCORE	ASSIGN-SCORE	QRISK 1 and QRISK2	Pooled cohort studies equations
Data	Prospective studies: Framingham Heart Study and Framingham offspring study	12 pooled prospective studies	SHHEC Prospective study	QRESEARCH database	Four pooled prospective studies: • ARIC • CHS • CARDIA • Framingham (original and offspring studies)
Population	General population, Framingham, Massachusetts, USA; baselines: 1968–1971, 1971–75, 1984–87	12 prospective studies from 11 European countries; baselines: 1972–91	Random sample from general population in Scotland; baseline: 1984–87	Data collected from 1993–2008 from GP databases – imputation of missing data	Baselines 1987–89 (ARIC), 1990 and 1992–93 (CHS), 1985–86 (CARDIA), 1968–1971, 1971–75, 1984–87 (Framingham)
Sample size	3969 men and 4522 women	117,098 men and 88,080 women	6540 men and 6757 women	1.28 million (QRISK1) 2.29 million (QRISK2)	11,240 white women, 9098 white men, 2641 African-American women and 1647 African-American men
Calculates	10-year risk of CAD event; later versions 10-year risk of CVD event (New Zealand and Australia derived 5-year risk)	10-year risk of CVD mortality	10-year risk of CVD events	10-year risk of CVD events Lifetime risk	10-year risk for a first atherosclerotic CVD event Lifetime risk
Age range (years)	30–75	40–65	30–74	35–74	20–79
Variables	Sex, age, total cholesterol, HDL-C, SBP, smoking status, DM, hypertensive treatment	Sex, age, total cholesterol or total cholesterol/ HDL-C ratio, SBP, smoking status. Versions for use in high and low-risk countries	Sex, age, total cholesterol, HDL-C, SBP, smoking – no. cigs, DM, area based index of deprivation, family history	QRISK1 – sex, age, total cholesterol to HDL-C ratio, SBP, smoking status, DM, area based index of deprivation, family history, BMI, BP treatment, ethnicity and chronic diseases	Age, sex, race (white or other/African American), total cholesterol, HDL-C, SBP, antihypertensive treatment, DM, smoking
Guidelines recommending its use	NCEP guidelines, Canadian CV guidelines, other national guidelines recommend adapted versions, including New Zealand	European Guidelines on CVD Prevention	SIGN	NICE guidelines on lipid modification QRISK Lifetime risk recommended by JBS3 guidelines	2013 AHA ACC Guideline on the assessment of CVD risk

ACC, American College of Cardiology; AHA, American Heart Association; ARIC, Atherosclerosis Risk in Communities; ATP, Adult Treatment Panel; BMI, body mass index; BP, blood pressure; CAD, coronary artery disease; CARDIA, Coronary Artery Risk Development in Young Adults; CHS, Cardiovascular Health Study; CVD, cardiovascular disease; DM, diabetes mellitus; HDL-C, high-density lipoprotein cholesterol; JBS, Joint British Societies; LDL-C, low-density lipoprotein cholesterol; NCEP, National Cholesterol Education Program; NICE, National Institute for Health and Care Excellence; no. cigs, number of cigarettes; PROCAM, Prospective Cardiovascular Munster Study; SBP, systolic blood pressure; SIGN, Scottish Intercollegiate Guidelines Network; SHHEC, Scottish Heart Health Extended Cohort

Source: Extracted with permission from Piepoli MF, Hoes AW, Agewall S, et al. 2016 European Guidelines on cardiovascular disease prevention in clinical practice. The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts) developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR). Eur Heart J 2016;37(29):2315–81; Table 2.

Box 2. Framingham and non-Framingham cardiovascular disease (CVD) risk factors

Framingham Risk Equation factors*†[19]	Non-Framingham Risk Equation factors§[20]	Clinically high-risk conditions[20]
• Age • Gender • Smoking status • Systolic blood pressure • Total cholesterol‡ • HDL cholesterol‡ • Diabetes status • Left ventricular hypertrophy (LVH)†	• Obesity (BMI >30 kg/m^2 and/or waist circumference >102 cm men, >88 cm women) • Family history of CVD before age 55 years in a mother, father or sibling • Presence of albuminuria‖ • Atrial fibrillation • Impaired fasting glucose ≥6.1 mmol and <7.0 mmol or glucose intolerance (two-hour glucose ≥7.8 mmol and ≤11.0 mmol) • Socioeconomic hardship • Depression/other psychosocial stress • Excessive alcohol intake	• Extreme risk factor elevations (SBP ≥180 or DBP ≥110, total cholesterol >7.5 mmol/L) • Type 2 diabetes and aged >60 years • Type 2 diabetes and albuminuria‖ • Moderate to severe chronic kidney disease (eGFR <45 ml/min/1.73 m^2 or persistent proteinuria) • Familial hypercholesterolaemia

BMI, body mass index; DBP, diastolic blood pressure; eGFR, estimated glomerular filtration rate; SBP, systolic blood pressure

*The 1991 Framingham Risk Equation (FRE) is intended for people without CVD. The most recently recorded pre-treatment measures for BP or lipids should be used to estimate CVD risk in people already receiving treatment. Where this is not possible, clinicians should make decisions on use of pharmacotherapy based on discussions with the patient and consideration of the individual context.

†It is preferable to assess for LVH on the basis of echocardiography criteria rather than via an electrocardiogram.

‡A reasonable estimation of risk can be obtained from a non-fasting lipid sample in most circumstances.

§There are many additional risk factors that are independently associated with increased CVD risk, such as C-reactive protein, coronary calcium scores, and plasma homocysteine levels. Measurement of such factors can be costly and invasive, and there is limited evidence to suggest that assessment of these risk factors substantially improves risk prediction over those listed in Box 1.

‖Albuminuria is defined as an albumin excretion rate >20 mcg/min or urinary albumin to creatinine ratio >2.5 mg/mmol in males and >3.5 mg/mmol in females.

Box 3. Stroke risk assessment in people with atrial fibrillation*

Risk factors	Score
Congestive heart failure	1
Hypertension	1
Age ≥75 years	2
Age 65–74 years	1
Diabetes mellitus	1
Stroke/transient ischaemic attack/thromboembolism	2
Vascular disease	1
Sex female	1

*Consider oral anticoagluant treatment when total CHA_2DS_2-VASc score ≥2. Calculators are also available to assess harms from bleeding (refer to 'Resources').

Resources

Absolute risk calculation

- National Vascular Disease Prevention Alliance (NVDPA), Australian absolute cardiovascular disease risk calculator (refer to Appendix A: Australian cardiovascular risk charts, in this National Guide) and the Framingham Risk Equation (FRE) calculator modified to align with Australian guidelines, www.cvdcheck.org.au
- Although the FRE is validated for people aged 30–74 years, these charts start from age 35 years. Some calculators embedded in clinical software and the CARPA charts (refer below) can be used to assess risk in 30–34 year olds. For people aged 75 years and older without previous CVD, it is recommended to input 74 years of age to obtain a minimum risk score.

  Remote Primary Health Care Manuals (RPHCM), STM 4. Chronic diseases, 'Assessing and reducing cardiovascular risk, https://docs.remotephcmanuals.com.au/review/g/manuals2017-manuals/d/20315.html?page=2
- The Indigenous-specific charts are identical to the NVDPA resources except for two features:
  - the corresponding colour has had a 5% absolute risk loading added (ie the lowest risk colour has been changed from <5% to <=9%)
  - the lower age limit has been changed from 35 years to 20 years. Although the FRE is validated for people aged 30–35 years, there are no empirical data assessing its use for those aged 20–29 years.

Blood pressure and lipid management guidelines

- National Heart Foundation, *Guideline for the diagnosis and management of hypertension in adults: 2016*, www.heartfoundation.org.au/images/uploads/publications/PRO-167_Hypertension-guideline-2016_WEB.pdf
- National Vascular Disease Prevention Alliance (NVDPA), *Absolute cardiovascular disease risk management: Quick reference guide for health professionals*, www.cvdcheck.org.au/pdf/Absolute_CVD_Risk-Quick_Reference_Guide.pdf

Blood pressure and lipid resources for patients

- National Heart Foundation, cholesterol facts for Aboriginal communities, https://heartfoundation.org.au/images/uploads/publications/NAHU-Cholesterol.pdf
- NPS MedicineWise, a range of blood pressure management resources, www.nps.org.au/conditions/heart-blood-and-blood-vessel-conditions/blood-pressure/for-health-professionals/for-your-patients/indigenous-resources

Oral anticoagulant management calculators and recommendations

- Cardiovascular Expert Group, Therapeutic guidelines: Cardiovascular. Version 6. Melbourne: Therapeutic Guidelines Limited, 2012.
- CHA_2DS_2VASc/HAS-BLED/EHRA atrial fibrillation risk score calculator, www.chadsvasc.org
- NPS MedicineWise, 'Warfarin and how to take it', decision aid on starting oral anticoagulants, www.nps.org.au/medical-info/consumer-info/warfarin

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Chapter 12: Type 2 diabetes prevention and early detection

Background

Type 2 diabetes is a progressive condition in which the body loses the capacity to produce enough insulin and/or becomes resistant to insulin's effects. This usually develops slowly over years, providing a substantial 'pre-diabetic' window period of opportunity to offer preventive interventions. Screening for diabetes is safe, accurate and cost effective, and detects a substantial proportion of people who may not otherwise have received early intervention.[1] This guide discusses the prevention of type 2 diabetes in adults who are not pregnant. It does not address how to manage type 2 diabetes, for which readers are encouraged to consult clinical guidelines.[2]

One in nine Aboriginal and Torres Strait Islander adults has diabetes,[3] with the prevalence of type 2 diabetes being 3.3 times higher at any age than for the general Australian population, and type 2 diabetes is a direct or indirect cause for 20% of Aboriginal and Torres Strait Islander people's deaths.[4] Diabetes prevalence in remote populations (21%) is more than double that of non-remote populations (9%)[4] and is higher among Torres Strait Islander peoples than Aboriginal peoples.[5]

Large clinical trials have demonstrated that appropriate management of diabetes can prevent the development or delay the progression of complications such as myocardial infarction, eye disease and renal failure.[6]

Obesity is a very strong predictor for diabetes; Aboriginal and Torres Strait Islander adults who are obese are seven times as likely as those of normal weight or underweight to have diabetes (17% compared with 2.4%).[4] A cohort study of non-diabetic Aboriginal adults aged 15–77 years in Central Australia found that those with a body mass index (BMI) of ≥25 kg/m2 had 3.3 times the risk of developing diabetes over eight years of follow-up compared to those with BMI of <25 kg/m2.[1] The AusDiab study found that three measures of obesity – BMI, waist circumference and waist-to-hip ratio – all had similar correlations with diabetes and CVD risk.[7]

Interventions

Screening

Type 2 diabetes can be a disease with few or no symptoms, so is prone to under-diagnosis. A small 2008 study of Aboriginal and Torres Strait Islander people in Darwin found an overall diabetes prevalence of 17%, of which one-third were previously undiagnosed. When those undiagnosed were assessed for diabetes complications, 19% had albuminuria, 14% had peripheral vascular disease, 6% had neuropathy and none had retinopathy.[8]

Screening for undetected diabetes is an efficient method of preventing complications from this disease.[1] Screening for diabetes will also detect prediabetes – impaired glucose tolerance (IGT) and/or impaired fasting glucose (IFG). The biochemical criteria for diabetes are listed in Box 1, and those for IGT and IFG are listed in Box 2. Prediabetes is not a disease, and there is some controversy as to the benefits of diagnosing it,[9] because risk reduction should ideally be promoted regardless of giving the condition a label. Prediabetes is a marker for higher risk of developing diabetes and cardiovascular disease (CVD), although diagnosing prediabetes via screening has been shown to be inaccurate.[10]

Screening for diabetes in non-pregnant adults should be done on an opportunistic basis in the primary care setting, rather than in mass screening programs (evidence level IV).[1] Aboriginal and Torres Strait Islander people should be screened for diabetes from age 18 years, rather than from 40 years as in the general Australian population.[1]

The recommended screening method for the general population is using AUSDRISK,[11] a risk assessment tool that asks questions about age, gender, ethnicity, family history, hypertension, smoking, diet, physical activity and obesity. AUSDRISK is available online or as a printout,[12] and those scoring ≥12 proceed to biochemical blood testing.

However, given the high background prevalence of type 2 diabetes in Aboriginal and Torres Strait Islander adults, AUSDRISK has limited use as a screening tool, and adults should instead proceed directly to blood testing for diabetes in conjunction with other opportunistic screening (such as for cardiovascular risk assessment – refer to Chapter 11: Cardiovascular disease prevention). Given the higher prevalence of diabetes-related complications in the Aboriginal and Torres Strait Islander population, proceeding to direct screening for diabetes has the potential to identify diabetes earlier.

Diagnosis

In diagnosing diabetes, a fasting or random blood glucose that indicates diabetes should be confirmed by retesting on a separate day, because intra-individual variation occurs. However, this may not be necessary if the patient has diabetic symptoms and a strongly positive test result.

A laboratory venous glucose test is more reliable than a capillary point-of-care test (finger prick), but the latter may sometimes be more practical and also enables further action on the same visit. An opportunistic random blood glucose is a reasonable alternative to a fasting sample, in situations where the patient is unlikely to return for a fasting test, but the 'equivocal' range is altered to 5.5–11 mmol/L.[1]

The National Vascular Disease Prevention Alliance (NVDPA) 2011 Australian guidelines state: 'When a fasting sample is not possible, non-fasting glucose can be measured with further testing required if the result is ≥5.5 mmol/L. HbA1c can be used to diagnose diabetes with a level ≥6.5% (48 mmol/mol) being diagnostic.'[13]

In Australian guidelines since 2012, glycated haemoglobin (HbA1c) level ≥6.5% (48 mmol/mol) has become an acceptable method for diagnosing diabetes,[14] and since 2014 has qualified for an annual Medicare Benefits Schedule (MBS) rebate.[15] This rebate also applies to point-of-care 'finger prick' HbA1c testing in services enrolled in the Quality Assurance for Aboriginal and Torres Strait Islander Medical Services (QAAMS) pathology program.[16]

In remote settings, using point-of-care 'finger prick' HbA1c testing and, if abnormal, laboratory confirmation, has led to more rapid and accurate diagnosis of diabetes than the traditional glucose algorithm – that is, fasting glucose and confirmatory oral glucose tolerance test (OGTT).[17] In children and adolescents, using HbA1c as a screening tool may underestimate the prevalence of diabetes.[18]

HbA1c results are affected by haemoglobin variants and alterations in red blood cell turnover (including pregnancy).[19] Point-of-care HbA1c results may be less reliable than laboratory results, although the accuracy is still usually enough to rely upon for diagnosis.[20] However, HbA1c results below the diagnostic threshold of 6.5% should be interpreted with caution, as HbA1c is neither sensitive nor specific for detecting prediabetes.[10]

There is no role for routinely testing insulin levels to assess insulin resistance.[11]

Behavioural interventions

The key behavioural interventions used to manage pre-diabetes are the same as those that have been shown to halve mortality in people with established type 2 diabetes when used intensively.[21] For those with IGT, the Finnish Diabetes Prevention Study showed that interventions aimed at modifying weight, diet and exercise not only halved the incidence of diabetes at four years compared to a control group (number needed to treat [NNT] = 8), but maintained most of this benefit for at least three years after the initial intervention was ceased.[22] There is strong evidence (level I, grade A) that lifestyle modifications that focus on weight loss, dietary change and increased physical activity should be offered to all individuals at high risk of developing type 2 diabetes.[1] The large ADDITION randomised trial suggested that for newly diagnosed type 2 diabetes, 'routine' risk factor management is almost as effective in reducing cardiovascular events and death as intensive risk factor management.[21]

Dietary intervention can effectively delay or prevent diabetes. The Da Qing IGT and Diabetes Study found that, after six years, the group given specific dietary advice had a 33% reduction in the incidence of diabetes compared to the control group. Even 17 years after the study finished, follow-up data showed a 19% reduction in diabetes in the intervention group.[23] Dietary recommendations are found in the Australian dietary guidelines (refer to Chapter 1: Lifestyle, 'Overweight and obesity').

Increasing physical activity is a particularly important and effective method of preventing diabetes. The diabetic-related benefits of regular exercise are not limited to subjects who are successful in losing weight. In the Finnish Diabetes Prevention Study, subjects who exercised for at least four hours per week but did not lose weight still had a four-fifths relative reduction in incidence of diabetes at one year compared to those who were sedentary.[22] A systematic review found good evidence of a 30% reduction in diabetes for walking briskly for ≥2.5 hours per week.[24] Ideally, a diabetes prevention strategy involves the combined interventions of diet modification and increased exercise. A 2017 systematic review found that lifestyle interventions were associated with a 36% reduction in relative risk of type 2 diabetes over six months to six years.[10] A seven-year follow-up study in a remote Aboriginal community involving diet and physical activity interventions found that, despite an increase in average BMI, the prevalence of IGT decreased and diabetes prevalence did not increase, possibly due to improved physical activity.[25] Sedentary activities such as watching television are associated with diabetes; in Australia, those who watch television for more than 14 hours per week are 2.3 times as likely to develop new diabetes as those who watch less than 14 hours.[26] Although this does not prove a direct causative effect, it is reasonable to encourage a reduction for heavy television viewers, particularly if replaced by a non-sedentary activity.

The national physical activity guidelines recommend a gradual increase in activity intensity to a goal of at least 30 minutes of moderate physical activity on most, and preferably all, days, and also have recommendations on reduced sitting time (refer to Chapter 1: Lifestyle, 'Physical activity').

As part of an Aboriginal and Torres Strait Islander MBS Health Assessment (item 715), a high risk of diabetes based on AUSDRISK is an eligibility criterion for referral to subsidised lifestyle programs.[27] However, an AUSDRISK score of ≥12 was shown to not be a sufficiently specific threshold to prioritise referrals to lifestyle programs in a Victorian cross-sectional survey of the general population aged 40–74 years. Up to 40% of people in this study would be eligible for lifestyle programs, making the tool non-discriminatory.[28] Moreover, Aboriginal and Torres Strait Islander people have fewer opportunities to use lifestyle programs due to issues with their suitability, cultural issues, family obligations, and a range of social and economic barriers that increase cardiovascular risks but also limit participation. Open access to lifestyle programs that are culturally appropriate and integrated with screening are likely to be more acceptable.[29]

Chemoprophylaxis and surgery

Current National Health and Medical Research Council (NHMRC) guidelines state that, as many of the medications used in diabetes prevention studies have established side effects, potential benefits and harms should be taken into account before considering pharmacotherapy.[1]

Oral hypoglycaemic medication at the pre-diabetic stage can delay or prevent progression to diabetes. A meta-analysis of 31 randomised trials in people at risk of diabetes showed metformin improves weight, lipid profiles and insulin resistance, and reduces new-onset diabetes by 40%.[30] Despite these promising results, metformin appears to be less effective than lifestyle changes. A large US trial randomised subjects with pre-diabetes into an intensive lifestyle modification program, metformin, or placebo.[31] At three years, the metformin group had a 31% relative risk reduction in onset of diabetes compared to placebo (NNT = 13.9). However, the lifestyle changes group showed a significantly larger relative risk reduction of 58% (NNT = 6.9) across all ages and ethnic groups. The trial was prematurely discontinued on the basis that it was unethical not to offer all participants the intensive lifestyle program.

A Cochrane review showed that acarbose reduces the incidence of type 2 diabetes by 25% (NNT=10) in patients with IGT.[32] A study randomising subjects with obesity into receiving lifestyle advice plus either orlistat (a weight loss agent) or placebo found that, in the subgroup who had IGT at baseline, orlistat gave a 45% risk reduction of progression to diabetes at four years.[33] However, a high number discontinued therapy: 48% of the orlistat group, and 66% of the control group.

Surgical weight loss interventions for severe obesity can result in a dramatic reduction in diabetes. The Swedish Obese Subjects study compared subjects who had bariatric surgery with matched controls. At two years, the 1845 surgery cases had a 32-fold reduction in incidence of newly diagnosed diabetes.[34] At eight years, the prevalence of diabetes in the surgery group remained unchanged from baseline, but had tripled (from 7.8% to 24.9%) in the matched controls.[35] A prospective study of 30 obese Aboriginal adults diagnosed with diabetes who underwent gastric banding found that 66% had diabetes remission at two years.[36] (Refer to Chapter 1: Lifestyle, 'Overweight and obesity' for a more detailed review of surgical weight loss interventions.)

All people at risk for diabetes should be offered lifestyle advice encouraging increased physical activity and improved dietary intake, and advised as to the benefits of weight loss. People who are morbidly obese and potentially suitable for bariatric surgery should be encouraged to consider surgical referral, if available.

Environmental

In remote and rural areas, poor food supply undermines efforts to address the poor nutritional status of Aboriginal and Torres Strait Islander peoples. Community stores are frequently the only food source outside traditional 'bush' food.[37] Various programs to influence the quality and cost of high-nutritional foods in community stores have had some success; a retail cooperative in Arnhem land provided 100% freight-subsidised fruit and vegetables and doubled the intake of these foods per person at three years.[38] An analysis of 29 years of community store interventions in remote South Australia found that some schemes successfully improved access to healthy, fresh foods, but overall diet quality had worsened over time.[39]

Surveys in many remote and rural Aboriginal communities have shown facilities for sporting and recreational activities are lacking, yet these are a high priority for community members.[40] (Refer to Chapter 1: Lifestyle, 'Overweight and obesity'.)

Recommendations: Type 2 diabetes prevention and early detection

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	Adults aged ≥18 years, particularly adults with any of the following high-risk conditions: • previous impaired glucose tolerance (IGT) or impaired fasting glucose (IFG) (Box 2) • history of gestational diabetes mellitus • history of polycystic ovary syndrome • history of cardiovascular disease • current antipsychotic medication use	Measure fasting plasma glucose or random venous blood glucose or HbA1c A laboratory test is preferable, but finger prick (point-of-care) testing is an alternative Perform oral glucose tolerance test (OGTT) in those with equivocal results The 2012 World Health Organization or International Diabetes Federation criteria[46] should be used to diagnose type 2 diabetes (Box 1) Given the high prevalence of diabetes, use of screening tools such as AUSDRISK is likely to be of limited benefit	Annually as part of adult health check	IIB GPP	1
	People aged <18 years with overweight or obesity	Consider the potential for early onset type 2 diabetes and consider testing according to clinical context (refer also to Chapter 1: Lifestyle, 'Overweight and obesity')	Opportunistic	GPP	41

Recommendations: Type 2 diabetes prevention and early detection					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	All people	Measure body mass index (BMI) and waist circumference (refer to Chapter 1: Lifestyle: 'Overweight and obesity') Advise minimum of 30 minutes moderate activity on most days (refer to Chapter 1: Lifestyle, 'Physical activity') Encourage diet rich in vegetables, fruits, legumes, high-fibre cereals, fish and lean meats. Limit fats, salt, sugar and alcohol (refer to Chapter 1: Lifestyle, 'Overweight and obesity') For people overweight or obese, refer to Chapter 1: Lifestyle, 'Overweight and obesity'	Opportunistic and as part of annual health assessment	IA	1, 26
	People with BMI ≥35 kg/m^2	Advise intensive lifestyle modification as above Discuss risks and benefits of bariatric surgery and consider referral if services are available (refer to Chapter 1: Lifestyle, 'Overweight and obesity')	Opportunistic	IIIC	1
Chemo-prophylaxis	People with a high-risk condition (refer above)	Advise intensive lifestyle modification as above If lifestyle modification is unable to be achieved, the use of metformin, acarbose, or orlistat has been shown to delay or prevent the onset of diabetes. However, these medications all have potential risks. None are Pharmaceutical Benefits Scheme (PBS) funded for people without diagnosed diabetes, and their use is not recommended	Opportunistic	IB	1
Environmental	Communities	Advocate for multifactorial and coordinated community-based interventions to increase access to healthy and nutritious food and promotion of increased physical activity (refer to Chapter 1: Lifestyle: 'Overweight and obesity' and 'Physical activity')		GPP	42–45

Box 1. Diagnostic definitions of type 2 diabetes[46]

Diabetes can be diagnosed on any of the following criteria:

- Fasting plasma glucose (FPG) ≥7.0 mmol/L
- 75 g oral glucose tolerance test (OGTT) with FPG ≥7.0 mmol/L and/or two-hour plasma glucose ≥11.1 mmol/L
- Glycated haemoglobin (HbA1c) ≥6.5%/48 mmol/mol
- Random plasma glucose ≥ 11.1 mmol/L in the presence of classical diabetes symptoms

Asymptomatic individuals with a single abnormal test should have the test repeated to confirm the diagnosis unless the result is unequivocally elevated.

Where a random plasma glucose level ≥5.6 mmol/L and <11.1 mmol/L is detected, an FPG should be measured, an OGTT performed, or an HbA1c measured.

Box 2. Prediabetes: Diagnostic definitions of impaired fasting glucose (IFG) and impaired glucose tolerance (IGT)[11]

The presence of prediabetes is defined according to the results of a two-hour oral glucose tolerance test (OGTT).

IFG:

- fasting glucose 6.1–6.9 mmol/L, **and**
- two-hour glucose <7.8 mmol/L

IGT:

- fasting glucose <7 mmol/L, **and**
- two-hour glucose ≥7.8 mmol/L and ≤11 mmol/L

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Chapter 13: Chronic kidney disease prevention and management

Background

Chronic kidney disease (CKD) in adults is defined as either kidney damage or a glomerular filtration rate (GFR) <60 ml/min/1.73 m^2, or both, persisting for at least three months. Kidney damage in this definition includes pathological abnormality or a marker of damage such as abnormalities in blood tests, urine tests or imaging studies.[1] CKD is classified into six stages depending on GFR, as outlined in Table 1.[1,2] Note that stage 2 CKD requires evidence of kidney damage in addition to reduced GFR, whereas stages 3A–5 are defined on the basis of GFR alone.

Aboriginal and Torres Strait Islander peoples have a greatly increased prevalence of CKD,[3] and are approximately five times more likely than non-Indigenous Australians to develop end-stage kidney failure.[4] Decline in GFR appears to be faster in Aboriginal and Torres Strait Islander individuals than in non-Indigenous individuals, and increased albumin excretion is a powerful predictor of GFR decline.[5] However, there is great variation in prevalence between Aboriginal and Torres Strait Islander communities; rates are highest in remote areas and lowest in urban areas.[3,6] Rates also correlate strongly with socioeconomic disadvantage.[4,7] The reasons are multifactorial,[8] but important modifiable risk factors in Aboriginal and Torres Strait Islander peoples are thought to be the same as those in non-Indigenous people: overweight and obesity, diabetes, hypertension and smoking.[3,4]

Reduced GFR and raised urinary albumin excretion are independent risk factors for mortality.[9] The bulk of this mortality is due to cardiovascular disease (CVD), and people with CKD are at higher risk of dying from CVD than they are of progressing to end-stage kidney disease (ESKD).[10,11] Even mild reduction in GFR is associated with excess cardiovascular and stroke risk,[12,13] while at any given level of kidney function, microalbuminuria or macroalbuminuria is associated with increased cardiovascular and stroke morbidity and mortality.[14,15]

Interventions

GFR testing

In clinical practice, GFR is often estimated (eGFR) from serum creatinine and other parameters, including sex and age, using a formula such as that of the CKD epidemiology collaboration (CKD-EPI). This formula has been shown to perform well in Aboriginal and Torres Strait Islander people, both with and without diabetes.[16] Care should be taken in accepting an eGFR at face value. Factors such as inter-current illness, certain diets, underweight, overweight, muscle diseases, high muscle mass or severe liver disease can bias the estimate.

Proteinuria and albuminuria testing

Abnormal proteinuria is an important marker of kidney damage. Urinary protein usually includes albumin, and the proportion of total protein that is albumin is typically increased at higher levels of proteinuria.[17] In diabetes and under most other circumstances, measurement of urinary albumin is a more sensitive test for CKD than testing for proteinuria; in the AusDiab baseline study, only 8% of adults with proteinuria tested negative for albuminuria.[17] The majority of Australian and international guidelines recommend screening for albuminuria rather than proteinuria for the detection of CKD.[18] However, it is important to note that not all individuals with CKD exhibit abnormal albumin or protein excretion, and also that a small proportion of patients with abnormal proteinuria, such as those with tubulointerstitial disease or myeloma, may excrete abnormal amounts of non-albumin protein only.

Abnormal albumin excretion is classified as microalbuminuria (30–300 mg/24 hours) or macroalbuminuria (>300 mg/24 hours).[18] A properly performed dipstick test, if negative, rules out macroalbuminuria but not

microalbuminuria; a positive result requires confirmation by laboratory methods.[19] It is often convenient to measure the albumin–creatinine ratio (ACR) on a spot specimen, preferably taken during first morning void. Table 2 provides definitions for microalbuminuria and macroalbuminuria based on ACR estimation. However, the relationship between this ratio and the albumin excretion rate is influenced by many factors, so that estimation of 24-hour excretion from the ACR value is not recommended.[18]

Albumin excretion may be increased by urinary tract infection, acute febrile illness, high dietary protein, heart failure, recent heavy exercise or some drugs. Menstruation or vaginal discharge may also increase urinary albumin levels. Definition of abnormal albuminuria requires at least two elevated ACR measurements in a three-month period, so that a single abnormal test should be repeated.[18]

Primary prevention

Evidence supports the efficacy and cost-effectiveness of screening for CKD risk factors (Table 3), and for CKD, in Aboriginal and Torres Strait Islander peoples.[20,21] In the absence of risk factors, current guidelines recommend measuring albumin excretion and eGFR at least biennially from the age of 30 years.[21,22] However, the 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey found 17.9% of participants aged ≥18 years had indicators of CKD, so that biennial screening of all adults should be considered.[23] Measurement of albumin excretion and eGFR should be offered at least annually to patients with risk factors.

The robust epidemiological evidence and plausible biological explanations for the association of overweight and obesity, diabetes, hypertension and smoking with CKD suggest that interventions to prevent diabetes,[24,25] to promote exercise, healthy diet and normal weight, to limit salt intake and to discourage smoking have the potential also to reduce the incidence of CKD.[26–29] Programs to promote maternal health during pregnancy, and to prevent streptococcal infection in childhood, may also reduce future risk of CKD.[30]

Secondary prevention

Active treatment of CKD, once detected, can slow progression to end-stage disease, and reduce cardiovascular endpoints. Patients should be assisted to quit smoking,[26] consume a healthy diet, reduce excess weight[31] and take regular exercise.[29] Limiting dietary sodium intake to no more than 100 mmol (approximately 6 g salt) per day may reduce both blood pressure and albumin excretion.[31]

An angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor blocker (ARB) is generally the first-line treatment for lowering blood pressure (BP) and protein excretion. These two classes of drug should not normally be prescribed together: although the combination may reduce both BP and proteinuria to a greater extent than monotherapy with either, it is associated with an increase in adverse effects and worse renal outcomes.[32,33]

Statins lower death and major cardiovascular events in people with CKD not requiring dialysis.[34] The effects on stroke and progression of CKD are uncertain.

Referral to secondary care

The interventions in the 'Recommendations' are concerned with preventing kidney disease, detecting and slowing the progression of established CKD, and reducing the associated risks of CVD and stroke. While they are all amenable to delivery in the primary care setting, patients with more advanced disease or significant comorbidities, or at risk in other ways, are likely to benefit from referral to a secondary care nephrology service.[35] Australian guidelines recommend referral of patients with any of the following:[36,37]

- stage 4 or 5 CKD of any cause
- persisting macroalbuminuria (Table 2)
- a sustained decrease in eGFR of 25% or more, **or** a sustained decrease in eGFR of 15 mL/min/1.73 m^2 within 12 months
- glomerular haematuria with albuminuria
- CKD and elevated BP that is not at target despite at least three BP–lowering medications.

Recommendations: Chronic kidney disease prevention and management					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	People aged 18–29 years without any chronic kidney disease (CKD) risk factors	Screen for CKD risk factors (smoking, obesity, hypertension, diabetes, history of acute kidney injury, family history of kidney disease)	As part of an annual health assessment	IIIB	21, 38
	All people aged ≥30 years People aged 18–29 years with one or more of the CKD risk factors in Table 3	Screen for CKD with estimated glomerular filtration rate (eGFR) and urinary albumin–creatinine ratio (ACR; first void specimen preferred) If urine ACR is raised, repeat once or twice over three months (first void specimens if possible). For further quantification, consider collecting a timed specimen	Every two years (at least annual if CKD risk factor present)	IIIC	21, 22
Behavioural	Adults with any risk factors for CKD (refer above)	Offer individualised, structured education about risk factor avoidance and management	Opportunistic	IIIB	39
		Offer smoking cessation support (refer to Chapter 1: Lifestyle, 'Smoking') Advise avoidance of exposure to environmental tobacco smoke	Opportunistic	IIIB	26, 31, 40
		Encourage regular physical exercise appropriate to physical ability and medical history (refer to Chapter 1: Lifestyle, 'Physical activity')	Opportunistic	IIB	29, 31
		If overweight or obese, encourage weight loss Offer group diet and exercise sessions if available, especially for patients with type 2 diabetes (refer to Chapter 1: Lifestyle, 'Overweight and obesity')	Opportunistic	IB	31, 41
		Advise limiting dietary sodium intake to less than 100 mmol/day (6 g salt per day)	Opportunistic	IIIB	31
	Adults with CKD stages 1–3 (Table 1)	Lifestyle risk factor management as above	Opportunistic	As above for each risk factor	26, 29, 31, 39–41
		Encourage a balanced diet rich in fruit, vegetables and dietary fibre	Opportunistic	IIC	31

Recommendations: Chronic kidney disease prevention and management					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural		Advise consumption of the recommended daily intake of protein for adults (0.75 g/kg/day)	Opportunistic	IIC	31, 42
		Advise against salt substitutes that contain high amounts of potassium	Opportunistic	GPP	31
		A daily fluid intake of 2–2.5 L (including the fluid content of foods) is generally considered sufficient, although this might need to be varied according to individual circumstances	Opportunistic	IIIC	31
Chemo-prophylaxis	All persons with CKD	Regularly review medications to identify and avoid those with potential nephrotoxicity Advise patients taking an angiotensin-converting enzyme (ACE) inhibitor or angiotensin II receptor blocker (ARB) plus diuretic to avoid non-steroidal anti-inflammatory drugs (other than low-dose aspirin if indicated)	Opportunistic at every medication change	GPP	36, 43
	Adults with albuminuria (Table 2)	Advise treatment with an ACE inhibitor or ARB, regardless of eGFR or blood pressure (BP) level. The goal is >50% reduction in albumin excretion without symptomatic hypotension Concurrently advise minimising salt intake to <6 g per day	At diagnosis	IA	32, 36, 44
		An ACE inhibitor and ARB should not normally be prescribed together		IIB	33
	Adults with CKD and diabetes	Blood glucose control in patients with CKD and diabetes should be optimised, aiming for an individualised glycated haemoglobin (HbA1c) target that takes into account factors such as capacity and safety considerations	Opportunistic	IA	40, 45
	Adults with CKD and BP consistently above 140/90 mmHg	Recommend lifestyle changes as noted above, plus drug treatment aiming at BP <140/90 mmHg. Note that aiming towards systolic BP <120 mmHg has shown additional benefit when well tolerated by the patient (The number of drugs required to achieve target BP tends to increase with declining GFR)	Opportunistic BP check at every visit	IA	46
		In patients with diabetes or albuminuria, commence antihypertensive treatment with an ACE inhibitor or, if not tolerated, an ARB		IA	32, 46–48
	Adults with CKD	Patients with CKD who are not receiving dialysis should be offered statin therapy to reduce the risk of vascular events	At diagnosis	IA	32, 34
Environmental	Communities with high prevalence of scabies and pyoderma	Support the implementation of population-based strategies for reduction of scabies and pyoderma among children (refer to Chapter 3: Child health, and Chapter 10: Acute rheumatic fever and rheumatic heart disease)		IIIB	30, 49

Table 1. Stages of chronic kidney disease

Stage	Description	GFR (ml/min/1.73 m^2)
1	Kidney damage* with normal or increased GFR	>89
2	Kidney damage* with mild reduced GFR	60–89
3A	Moderately reduced GFR	45–59
3B	Moderately reduced GFR	30–44
4	Severely reduced GFR	15–29
5	Kidney failure	<15 or dialysis

GFR, glomerular filtration rate

*Kidney damage includes pathological abnormality or a marker of damage such as abnormalities in blood tests, urine tests or imaging studies degree[1].

Table 2. Definitions of normal albumin excretion, microalbuminuria and macroalbuminuria

	Gender	Normal albumin excretion	Microalbuminuria	Macroalbuminuria
Urinary albumin–creatinine ratio (ACR)	Male	<2.5 mg/mmol	2.5–25 mg/mmol	>25 mg/mmol
	Female	<3.5 mg/mmol	3.5–35 mg/mmol	>35 mg/mmol
Urinary albumin excretion per 24 hours	Either	<30 mg/24 hours	30–300 mg/24 hours	>300 mg/24 hours

Table 3. Risk factors for chronic kidney disease[38]

Modifiable	Non-modifiable
• Smoking • Obesity (BMI >30 kg/m^2) • Hypertension • Diabetes • Severe socioeconomic disadvantage	• Aboriginal or Torres Strait Islander aged >30 years • Stage 5 CKD or hereditary kidney disease in a first-degree or second-degree relative • History of acute kidney injury • Established vascular disease

BMI, body mass index; CKD, chronic kidney disease

Resources

- Kidney Health Australia, *Chronic kidney disease (CKD) management in general practice: Guidance and clinical tips to help identify, manage and refer patients with CKD in your practice*, 3rd edition, http://kidney.org.au/cms_uploads/docs/ckd-management-in-gp-handbook-3rd-edition.pdf
- Kidney Health Australia, Caring for Australasians with Renal Impairment (CARI), guidelines, www.cari.org.au

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Chapter 14: Sexual health and blood-borne viruses

Background

There are widely varying prevalence rates for sexually transmitted infections (STIs) and blood-borne viruses (BBVs) within Aboriginal and Torres Strait Islander populations,[1] reflecting different transmission risks from lack of condom use, use of needle exchange programs, sexual partner promiscuity, understanding of safe sex, cultural values and poor access to healthcare.[2] The majority of STI notifications (80%) for both the general population and Aboriginal and Torres Strait Islander peoples are in the age group 15–29 years. STI rates are higher in remote areas where the proportion of Aboriginal and Torres Strait Islander people is higher. Owing to under-identification of Aboriginal or Torres Strait Islander status, disease prevalence and incidence are difficult to reliably estimate; however, notification rates do appear to be increasing. Comparisons of STI rates between non-Indigenous people and Aboriginal and Torres Strait Islander peoples shows a significant difference between the two groups (Table 1). Syphilis notifications have increased four-fold in young Aboriginal and Torres Strait Islander people over the years 2010–15. This increase has been driven largely by the current syphilis outbreak across northern Australia.[3]

BBV notification rates are also higher in Aboriginal and Torres Strait Islander populations compared with rates in other Australians, particularly hepatitis C related to injecting drug use (Table 1). There are significant risks for increased rates of human immunodeficiency virus (HIV) in Aboriginal and Torres Strait Islander Australians due mainly to high rates of intravenous drug use and STIs, and often less access to condoms and pre-exposure prophylaxis (PrEP). For example, HIV infection rates in males have risen two-fold over the period 2011–15.[1]

Poverty, discrimination, substance abuse and incarceration all affect sexual behaviours and are associated with an increased risk of STIs and BBVs[4] (Box 1).

Table 1. National incidence of selected sexually transmitted infections and blood-borne viruses, per 100,000 population, and rate ratio of Aboriginal and Torres Strait Islander to non-Indigenous notifications in 2015[1]

	Aboriginal and Torres Strait Islander notifications/100,000 population	Non-Indigenous notifications/100,000 population	Rate ratio
Chlamydia	1,325	391	3.4
Gonorrhoea	626	62	10
Syphilis	61	10	6
Human immunodeficiency virus (HIV)	6.8	3.1	2.2
New case hepatitis C	167	36	4.6
New case hepatitis B	66	*22*	3

STIs and BBVs can cause significant complications, especially in pregnancy, which is why antenatal care, including comprehensive testing for STIs and BBVs, is so important. Antenatal engagement and screening should commence at earlier ages for Aboriginal and Torres Strait Islander mothers, as they tend to be younger and have higher fertility rates in the younger age groups than non-Indigenous mothers[5] (refer to Chapter 2: Antenatal care).

STIs and BBVs are often asymptomatic. Diagnosis and management are dependent on accurate risk assessment, screening and education. The majority of STIs in Australia are diagnosed in primary care rather than in specialist sexual health clinics.[6] Therefore, primary care staff need adequate skills to make a comprehensive sexual health and BBV assessment in a non-judgemental way. Empathy, sensitivity to the patient's feelings and needs, accessibility, a stated commitment to confidentiality, and sufficient medical knowledge on diagnosis and management of STIs are all important. A short explanation for questions can minimise embarrassment for both patient and clinician, obtain a true assessment of STI and BBV risk and increase engagement, management and education. This is particularly true of younger age groups (eg teenagers) and remote communities where STI and BBV risks are higher (Box 2).

Those with symptoms require encouragement to attend the clinic for testing and treatment. This involves a focus on patient education and making the health service acceptable to people via empathy, flexible care delivery, presence of both male and female practitioners and non-judgemental approaches. Outreach work is invaluable for this as it involves moving care from the clinic and into the community to offer sexual health services.

Testing for STIs and BBVs is simple, non-invasive and accurate, and for many diseases there are effective prophylactic measures and single-dose treatments. When testing is combined with discussions about contraception and condoms, a systematic and comprehensive approach to STI and BBV management and prevention in primary care can be adopted.

Specific sexually transmitted infections

Chlamydia

Chlamydia trachomatis is the most commonly diagnosed STI.[7] Notification rates in Australia in the general population have plateaued since 2011 after rising for the 15 years prior. However, in 2015 the chlamydia notification rate in major cities for Aboriginal and Torres Strait Islander peoples was twice as high as among non-Indigenous people, increasing to eight times higher in remote areas.[1] Asymptomatic infection is common in both sexes; for example, an estimated 85% of chlamydia infection does not present symptomatically.[8] Asymptomatic males are at higher risk of developing urethritis, epididymitis and a reactive arthritis (Reiter's syndrome) as a result of chlamydia infection. In women, chlamydia can cause cervicitis with the risk of developing salpingitis and pelvic inflammatory disease, ectopic pregnancy, infertility and chronic pelvic pain. Chlamydia can be transmitted from mother to baby during birth causing conjunctivitis, pneumonia and otitis media. Chlamydia infection in adults is easily tested for with a first void urine sample or high vaginal swab (often performed by the patient herself), and, if uncomplicated, treated with a single dose of azithromycin.[9] In the event of complications such as those outlined above or in the case of rectal infection, single dose therapy is not indicated and doxycycline 100 mg orally twice daily for seven days may be given.[7]

Gonorrhoea

Gonorrhoea is diagnosed ten times more commonly in Aboriginal and Torres Strait Islander peoples than in non-Indigenous people.[1] The incidence increases with remoteness, and with those belonging to higher risk groups such as sex workers and men who have sex with men (Box 1).[1] Gonorrhoea is a purulent infection of mucous membranes caused by *Neisseria gonorrhoeae*. It is largely asymptomatic in women but approximately 90% of men may suffer symptomatic urethritis, proctitis, epididymitis and, rarely, prostatitis. In women, it is a major cause of cervicitis and pelvic inflammatory disease, which can lead to chronic pelvic pain, infertility and ectopic pregnancy. In both sexes, locally acquired infection during oral sex can lead to pharyngitis while disseminated infection from both genital and oral sex can cause gonococcal septic arthritis. Infection during pregnancy can cause premature rupture of membranes, and infection at birth can result in neonatal gonococcal conjunctivitis. Like chlamydia, gonorrhoea is easily tested for with first void urine or, in the case of women,

endocervical or high vaginal swabs, and in most jurisdictions (check local guidelines) first-line treatment is with both intramuscular ceftriaxone and oral azithromycin owing to increasing antibiotic resistance.[10]

Trichomoniasis

Trichomonas vaginalis is a protozoal infection notifiable only in the Northern Territory. In Australia, trichomoniasis is more common in older women and women from rural and remote areas, and especially in Aboriginal and Torres Strait Islander peoples, among whom 2012 rates were 3595.7 per 100,000 population versus 38.6 in non-Indigenous people.[11] It is an uncommon cause of vaginal discharge or male urethritis in urban settings. Trichomoniasis remains detectable for years and becomes a chronic disease if it is left untreated in women.[12] Trichomoniasis infection is considered problematic not only because it increases the risk of serious complications in pregnancy, such as premature rupture of the membranes and pre-term delivery, but also because of increased susceptibility to HIV.[13,14] Despite its association with pregnancy complications, treatment of asymptomatic trichomoniasis infection has not been shown to reduce the rate of these complications. Managing trichomoniasis infection in pregnancy requires specialist advice (refer to Chapter 2: Antenatal care, for more information about screening).

In rural and remote Aboriginal and Torres Strait Islander populations (Modified Monash Category 3 [MMC3] and above), trichomoniasis is important to screen for because of the high incidence of infection, which owing to the chronic nature of persistent infection[13] appears to increase with age in women, and because it increases the transmission of HIV.[1] Screening is recommended in people aged <35 years in high-risk populations (Box 1) and is easily added to a first void urine sample collected when conducting polymerase chain reaction (PCR) testing for chlamydia and/or gonorrhoea.

Syphilis

Infectious syphilis notifications in Aboriginal and Torres Strait Islander people who are residing in remote areas have increased in the last five years. This is related to an outbreak that originated in Far North Queensland in 2015 and subsequently spread to most of northern Australia. Although there have been several congenital syphilis cases associated with this outbreak, notifications of congenital syphilis overall have remained stable over the last decade.[3] Syphilis notifications are also higher in men who have sex with men.

Syphilis management is complicated and infection is usually asymptomatic, so screening is an important control measure.[15]

Newly acquired syphilis is diagnosed in the presence of symptoms or signs such as chancre, rash, or wart-like condylomata lata, or alternatively this diagnosis is made when previous serology has become positive within two years of the original negative test. Typically, all patients will experience a chancre; however, this is not always obvious to the patient and generally resolves spontaneously. Complications of newly acquired syphilis include pregnancy loss and congenital syphilis. Longer term sequelae are rare but include neurosyphilis and cardiac complications. A lesion is required for sexual transmission to partners to occur.

Following newly acquired syphilis, there is typically a latent phase whereby secondary syphilis may develop. Latent syphilis is defined as asymptomatic infection together with positive serology where there have either been no previous tests (ie it is of unknown duration), or more than two years since the last negative test. Latent syphilis is usually only transmitted vertically from mother to child, not to partners; however, should secondary syphilis develop with symptoms, the patient is once again infective to partners until symptoms resolve. Highly specific treponemal antibody syphilis tests usually remain positive for years and are a poor marker of disease activity.[16] Therefore, in the event a patient has had a previous infection, expert interpretation is often indicated via the local public or sexual health unit.

Human papillomavirus

Human papillomavirus (HPV) genotypes 16 and 18 are the causative agents in 70–80% of all cervical cancers and are also implicated in vulval, vaginal, anal and penile cancers. HPV genotypes 6 and 11 are associated with 90% of genital warts and are rarely associated with cancer, and as such they are considered low risk.[17,18] Infections tend to occur most commonly in those aged 15–25 years in Australia; however, prevalence rates are changing due to the introduction of vaccination programs (refer below). Vaccination is recommended and funded for all school-age Australians. Education around the harms of HPV infection should be part of a comprehensive approach and include use of condoms for prevention and discussion of smoking as a risk factor for genital cancer.[12]

Other STIs

Donovanosis is an ulcerative STI affecting predominantly Aboriginal and Torres Strait Islander communities. There have been no locally acquired notifications in Australia for four years and eradication of this condition in Australia is becoming more likely.[19] This is largely due to case finding those with symptoms and use of effective azithromycin-based treatment regimens delivered within comprehensive primary healthcare settings.

Genital herpes is a common STI caused by herpes simplex virus types 1 and 2, and over half of cases are type 1. Men and women present similarly, typically with an initial episode of ano-genital ulceration and systemic features, followed by multiple relapses, recurrent, painful splitting of the skin and erythema with or without itch. The largest disease burden comes from the significant psychosexual affects owing to frequent relapses and increased HIV transmission. Diagnosis of genital herpes requires visual lesions to be present as swabs must be taken from a de-roofed ulcer or from the base of the ulcer. Following this, antiviral treatment with valaciclovir 500 mg orally twice daily for five days or longer (if severe) is indicated. Recurrences may be treated with the same dose of valaciclovir for three days because viral replication in recurrent infection tends to be shorter lived. Suppressive therapy for at least six months' duration is indicated for frequent, severe recurrences and may also prevent spread to partners.[7]

Neonatal herpes is the most significant complication of genital herpes and carries a high morbidity and mortality. It is important to ask pregnant women about past genital herpes simplex virus infections, especially if immunocompromised,[20] to determine if suppressive therapy may be required.

Blood-borne viruses

Human immunodeficiency virus

Human immunodeficiency virus (HIV) prevalence in Australia is lower than in most comparable high-income countries and this has been attributed to early adoption of needle and syringe programs (NSPs) and effective early education and community engagement, particularly for those in high-risk groups such as men who have sex with men. Co-infection with chlamydia, gonorrhoea and/or trichomoniasis is a significant risk factor for HIV, both in acquisition and transmission, highlighting the importance of regular STI screening to reduce the risk of HIV co-infection.[12]

HIV incidence in 2015 was more than two times higher for Aboriginal and Torres Strait Islander peoples than for other Australians. Notification rates were highest in Aboriginal and Torres Strait Islander people aged >35 years at 9.8 per 100,000 – nearly three times higher than in the Australian-born non-Indigenous population of the same age group. While HIV notification rates in Aboriginal and Torres Strait Islander males were stable previously, from 2011 to 2015 there was a two-fold increase (from 6.2 per 100,000 in 2011 to 12.4 per 100,000 in 2015). Over the same time, rates in other Australian-born males decreased by 12%. Increased notifications of newly diagnosed HIV in Aboriginal and Torres Strait Islander peoples when compared to non-Indigenous people have been attributed to intravenous drug use (16% versus 3% of HIV notifications respectively) and heterosexual transmission (21% versus 14% of HIV notifications respectively). In one-third of new HIV diagnoses among Aboriginal and Torres Strait Islander peoples in 2015, the infection was likely to have been present for more than four years prior to diagnosis based on immune function tests.[1] Late diagnosis is likely to be have been a legacy of lesser access to health services and reduced awareness of risk in this population.

Antiviral therapy is recommended in all with HIV, and strict adherence to multidrug regimens is critical to both minimising the risks of resistance and suppression of viral levels. Effective viral suppression minimises ongoing damage to the immune system and decreases risk of transmission.[9]

HIV testing in early pregnancy is strongly recommended as antivirals administered during pregnancy and labour can prevent up to two-thirds of neonatal HIV infection,[21] and shorter courses can prevent transmission in between a half and two-thirds of cases.[22]

Hepatitis C virus

The rate of hepatitis C virus (HCV) diagnosis in Aboriginal and Torres Strait Islander peoples in 2015 was nearly five times higher than in non-Indigenous people.[1] The rate of newly acquired HCV infection (ie hepatitis C infection with evidence of acquisition in the 24 months prior to diagnosis) in Aboriginal and Torres Strait Islander peoples in 2015 was 13 times that of non-Indigenous people (26 versus two per 100,000 respectively), possibly reflecting higher rates of risky behaviours. In the last five years, there has been a 45% increase in the notification of newly diagnosed HCV infection in Aboriginal and Torres Strait Islander peoples, whereas the rate in non-Indigenous people decreased by 10% over the same period.[1] In a 2015 survey, receptive syringe sharing (sharing a needle after an HCV-positive person has used it), a key risk factor for HCV transmission, was reported to be higher among Aboriginal and Torres Strait Islander peoples (24%) than among non-Indigenous people(14%).[1]

Medications made available recently under the Pharmaceutical Benefits Scheme (PBS) for hepatitis C treatment are highly effective, easy to take and have low rates of side effects. A sustained virological response (ie no detectable virus six months after completing treatment) can be expected in between 80% and 95% of cases with oral regimes of between eight weeks and six months' duration, depending on the serotype of virus and the presence or absence of cirrhosis. Treatment in primary care should be considered for all people with HCV regardless of the presence of risky behaviours such as ongoing illicit substance use. In the case of complex infections (eg HBV co-infection, presence of cirrhosis), referral for specialist management is recommended.[23]

Hepatitis B virus

In 2015, the notification rate of newly diagnosed hepatitis B virus (HBV) infection for Aboriginal and Torres Strait Islander peoples was three times higher than for non-Indigenous people across all age groups. Over 2011–15, there was a 22% decline in the notification rate of newly diagnosed HBV infection in Aboriginal and Torres Strait Islander peoples (from 85 per 100,000 in 2011 to 66 per 100,000 in 2015), compared to a plateau in rates in the non-Indigenous population (22 per 100,000 in 2015). At the end of 2015, of all the Australians living with chronic HBV, 9% were Aboriginal and Torres Strait Islander people, with higher rates among those living in a remote area.[12,24] In 2013, the prevalence of HBV in an Australian annual prison intake survey was 3.6% in Aboriginal and Torres Strait Islander people and 2.6% in non-Indigenous people.[1]

Universal vaccination programs commenced in 1990 in the Northern Territory and were implemented Australia-wide in 2000. The decrease in HBV prevalence, especially in those aged 15–29 years, may reflect a cohort who are immune upon the commencement of sexual activity.[1]

Hepatitis B serology interpretation can be confusing, but recent guidelines are helpful to primary clinicians.[24] Chronic HBV infection causes cirrhosis in approximately 25% of adults over a 20-year period and is a risk factor for hepatocellular carcinoma. The lifetime risk of cirrhosis is 20–30% in those with perinatal and childhood HBV infections.[25] While treatment of chronic HBV is not as effective as that now available for HCV, treatment reduces the progression to cirrhosis and induces some regression of cirrhosis in 70% of cases,[26] thereby decreasing the risk of hepatocellular carcinoma by two-thirds.[27] Trained and accredited general practitioners (GPs) can prescribe hepatitis B treatment or refer patients for specialist management.[28]

Additionally, HBV is more likely to be chronic if acquired early. Therefore, encouraging screening and vaccination pre-pregnancy and during pregnancy is very important in order to manage the risk of mother-to-baby transmission.

Interventions

Immunisation

The 2006 national school-based program of HPV vaccine is offered to both sexes from age nine years. Early data indicate the program is already effective and has resulted in declining incidence of both warts (59% decrease) and high-grade cervical lesions on Pap smears (48% decrease) in Australia.[25] A significant decline in genital warts has also been observed in young Aboriginal and Torres Strait Islander people.[29] This has yet to be translated to reduced cervical cancers in Aboriginal and Torres Strait Islander women. This is possibly explained by the long time after HPV exposure (decades) that it can take to develop cervical abnormalities.[30] However, this vaccination program is expected to significantly alter the trajectory of HPV infection and associated complications.[9]

Australia-wide universal HBV vaccination at birth commenced from 2000. Although HBV incidence rates are declining, the need for prevention and management of chronic HBV infection remains, particularly among older Aboriginal and Torres Strait Islander people.

The Australian immunisation handbook recommends hepatitis A vaccine for people who have chronic HBV or HCV infection, as concurrent infection with hepatitis A can greatly increase the risk of liver complications.[25] The original 1999 Queensland hepatitis A vaccination program was expanded in 2005 to include all Aboriginal and Torres Strait Islander children aged <2 years in the Northern Territory, Queensland, South Australia and Western Australia.[25]

Screening

Annual screening and management programs in Aboriginal and Torres Strait Islander communities have been shown to decrease STI prevalence locally, particularly if screening has good coverage of young people.[31] Western Australian guidelines recommend six-monthly screening in younger populations residing in remote areas. There is also emerging evidence that more frequent population-based screening for STIs may reduce STI incidence rates further.[14,31]

With the introduction of nucleic acid amplification tests (NAATs) or PCR tests in the 1990s, screening for chlamydia, gonorrhoea and trichomoniasis on a single urine or swab test has a high sensitivity and specificity, is much more acceptable to people, and can be reliably performed in places far from laboratories.[7] As NAATs do not currently detect antibiotic resistance in *N. gonorrhoeae*, strategies are required to culture specimens for antibiotic sensitivity surveillance to inform which antibiotics should be used. STI screening activity should also include education about STIs and safe sex advice including the use of condoms for prevention.[25]

Point-of-care testing (POCT) is increasingly being taken up in northern Australia.[32] POCT uses robust tests on a par with the NAATs and the time taken for a result can be reduced from weeks to 90 minutes, which can reduce the time to treatment and for contact tracing. It should be noted, however, that for syphilis and HIV, POCT testing is not as effective as NAAT and thus should not be used. Further, POCT is costly and is not subsidised under the Medicare Benefits Schedule (MBS).

Routine syphilis screening is recommended in the first trimester for all Aboriginal and Torres Strait Islander women who are pregnant. Individual antenatal patients who remain at high risk for STIs and those from, or who have sexual networks with, northern Australian Aboriginal and Torres Strait Islander communities should be considered for re-screening for STIs, including syphilis, in the third trimester (refer to Chapter 2: Antenatal care). Point-of-care antenatal syphilis tests have been trialled overseas and show promise for improving timeliness of treatment, but are not yet available routinely in Australia.[33]

Behavioural factors

Screening for STIs provides the opportunity to offer prevention and health promotion advice. Consistent condom use for vaginal and anal sex significantly reduces the risk of STI transmission and is the most effective method of preventing HIV transmission.[34] When discussing safe sex practices, it is important to recommend the use of condoms with water-based lubricant, and to discuss the barriers to condom use and

how they might be overcome. Patients should be advised to use condoms in new relationships until both partners have had an STI check. Additional issues to raise may include exploring personal safety, self-respect and respect for others in sexual relationships.[9]

The Australasian Society for HIV Medicine (ASHM; full title now Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine) publication *HIV, viral hepatitis and STIs: A guide for primary care*[9] includes excellent history-taking and risk-assessment approaches. It is vital to provide plain language information on STI transmission and prevention, and to build rapport with Aboriginal and Torres Strait Islander people during sexual health consultations. The guide includes an appendix by state and territory of clinicians' legal obligations. It is important to be familiar with the legislation in your state or territory regarding sexual activity in persons aged <18 years given mandatory reporting requirements in some jurisdictions.

The *Australasian contact tracing guidelines* has an excellent section on contract tracing considerations when working with Aboriginal and Torres Strait Islander peoples.[35] Contact tracing and partner notification are synonymous terms, and there are two different ways in which this can be conducted. The first form of contact tracing is through **patient referral**, whereby the index case contacts their own sexual contacts. In this circumstance, the health provider gives guidance on the advice to be translated to partners. This may also include 'patient-delivered partner therapy' (such as azithromycin for chlamydia). The second form of contact tracing is through **provider referral**, whereby the patient provides the healthcare provider with the contact details for their sexual partners. This allows for confidential contact tracing and is the method of choice for serious infections such as HIV.

Chemoprophylaxis

Specific to HIV transmission, PrEP with daily oral medication can prevent HIV infection from occurring. The efficacy of PrEP has now been established by several randomised placebo-controlled trials conducted in men who have sex with men, heterosexual adults and intravenous drug users. Daily PrEP is considered safe and effective to reduce the risk of HIV infection in **high-risk adults** who are able to take the medicine correctly and consistently.[36] It is available currently in most jurisdictions to high-risk populations (men who have sex with men, intravenous drug users, or partners of HIV positive people) on a trial basis. Contact your local sexual health service for more information.

Post-exposure prophylaxis (PEP) with daily medication **after** exposure to HIV can also reduce the risk of infection. The exposure could be via a biohazard exposure in the healthcare workplace, exposure through sex with an infected individual or through needle sharing. For HIV, it is recommended to start PEP within 72 hours of exposure, which involves the prescription of a course of medication.[37]

Environmental interventions

Access to free condoms is an important consideration given their value in preventing HIV and STI transmission.[34] The condom tree program in the Kimberley is an example of making condoms more available after hours in a rural setting.[38] GPs in urban practices can also consider putting condoms in clinic patient toilets to improve access.

Harm minimisation is the principle underlying Australia's National Drug Strategy, and this policy has been implemented since 1985. It encompasses a wide range of approaches involving supply reduction, demand reduction and harm reduction. Using clean injecting equipment is the most effective method of preventing transmission of HIV and HCV among injecting drug users in many settings in Australia, including prison.[9] NSPs provide sterile injecting equipment and are an effective, safe and cost-effective component of harm reduction strategies. Using a mathematical model, it is estimated that over the period 2000–09, NSPs cost $243 per capita but achieved a net saving of $1.03 billion in preventing 32,056 new HIV infections, and 96,667 new HCV infections.[39]

The incidence of injecting drug use among Aboriginal and Torres Strait Islander peoples, and the associated prevalence of HCV positivity, has been steadily increasing over the last decade. The rate of HIV in this population is low, with less than 1% being HIV positive over the NSP survey collection period between 1995

and 2007. Clients in contact with NSPs or in primary care settings should opportunistically receive brief interventions focused on motivation to assist with cessation of drug use.[37]

It is critically important that underlying substance dependence issues are addressed in order to lower the risk of BBV infection and other harms. Much of the evidence on environmental interventions relates to opioid use. Opioid-dependent individuals have been found to have an annual mortality of 2–4%, equating to 13 times that of their peers.[40] This increased mortality is primarily due to overdose, violence, suicide, and smoking-related and alcohol-related causes. Intravenous drug users have a reduced quality of life due to time spent intoxicated or seeking drugs as well as an increased rate of psychiatric comorbidity. Opioid dependence places a significant economic burden on society through increased healthcare costs, the criminal justice system and unemployment.[40]

Opioid substitution therapy (OST) consists of daily administration of an opioid agonist such as methadone, or an opioid partial agonist such as buprenorphine. The aim of OST is to reduce the use of illicit opioids, injection of drugs and risk of BBV infection, criminal activity and the risk of overdose, and improve psychological and physical health. It is a minimum standard recommendation by the World Health Organization (WHO) that opioid agonist maintenance treatment (OAMT) is an option and that this treatment is accessible to disadvantaged populations.[40] The WHO also recommends the availability of a variety of structured psychosocial interventions such as counselling, and assistance with housing, education, employment and legal problems. Patients with psychiatric comorbidity should have access to psychiatric treatment. OAMT has also been shown to reduce seroconversion to HIV.[40] This correlates with measured reductions in drug-related and sex-related risk.

GPs often have patients who present with requests that hint at opioid addiction, such as escalating doses for chronic pain, 'lost' prescriptions and injection-related morbidity. These are opportunities to discuss harm-reduction strategies, including OST. It is important to be familiar with local opioid pharmacotherapy prescribers and referral pathways for patients who express an interest in accessing OST and other harm reduction programs. Patients can also present in crisis when their level of motivation for change is high. Each jurisdiction in Australia has its own requirements for training of opioid prescribers.

Additionally, methamphetamine (ice) is an injectable drug, widely misused in Australia.[41] Although use of the drug remains stable across Australia, it is used heavily in certain groups of drug misusers.[41] There are, however, more recent reports of increased misuse of ice, with the National Drug and Alcohol Survey 2013 demonstrating that 7% of Australia's population have used ice at some point, and 2.1% within the past 12 months, compared with 6.3% and 2.3% in 2007.[42] The use of ice has been associated with multiple physical and psychological harms including toxicity, mortality, cardiovascular damage (including infective endocarditis),[43] cerebrovascular pathology, dependence and, importantly but often overlooked, BBV transmission.[44] Prevention of ice use can be achieved by increasing public education, and epidemiological and surveillance studies. People injecting ice should be offered NSPs in the same way as those with opioid dependence,[45] as well as tailored rehabilitation programs, because dependence patterns, and weaning, are different from alcohol rehabilitation, which is generally shorter in duration.

Recommendations: General prevention advice					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening/ testing	All sexually active people aged ≤30 years People with risk factors for sexually transmitted infections (STIs) and blood borne viruses (BBVs) (Box 1)	Screen for chlamydia, gonorrhoea and, if a high prevalence area, trichomoniasis (refer below) Offer screening for human immunodeficiency virus (HIV), syphilis and hepatitis B virus (HBV) (refer below)	Annually	GPP I	46 14, 47
		Consider offering females a human papillomavirus (HPV) test for cervical cancer screening (refer to Chapter 15: Prevention and early detection of cancer)	Opportunistic	GPP	48
	People diagnosed with an STI	Review STI risk factors and, if not already done, screen for other STIs according to local prevalence guidelines Screen for BBVs if risk factors present (refer below and Box 1)	Upon diagnosis, and re-test for all three months post-treatment	GPP	46
	Sexual partners of a person with an STI	Ensure contact tracing is undertaken at time of diagnosis Contact should be offered screening for STIs, HIV, syphilis and HBV, and be offered immediate treatment for the STI the index case had Options include 'partner referral', possibly including patient-delivered partner therapy; or 'provider referral' in consultation with the local sexual health team*	Every new diagnosis of an STI	GPP	49
	All sexually active patients	Provide sexual health counselling, including proactive discussion of issues of sexuality (Box 2)	Opportunistic	II	50, 51
Behavioural	All sexually active patients	Patients should be advised to use condoms in new relationships until both partners have had an STI check	Opportunistic	GPP	34
	People at higher risk of hepatitis B or C infection (Box 1)	Provide counselling on harm minimisation and promote peer education strategies around safer sex and injecting drug use	Opportunistic and as part of annual health check	GPP	52
	People with substance use	Conduct brief motivational interviewing to reduce use of illicit drugs, harm with injection of drugs, risky alcohol use and risk of BBV infection and STIs, particularly for those unlikely to attend specialist treatment	Opportunistic	GPP	53
	People with exposure to HIV, occupational or non-occupational	Assess post-exposure risk using national guidelines[17] and provide post-exposure prophylaxis (PEP) within 72 hours of the risk exposure when indicated (refer to 'Resources')	Opportunistic	GPP	37

Recommendations: General prevention advice					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	People at high risk of non-occupational HIV exposure, including men who have sex with men, intravenous drug users, and partners of HIV-positive people	Consider eligibility for pre-exposure prophylaxis (PreP) (refer to 'Resources')	Opportunistic	III	36
	Condom access	Ensure access to condoms (preferably free, private and available at all hours)	Opportunistic	GPP	54, 34
Environmental	People with opioid dependence	Refer to an opioid substitution therapy program for all interested individuals, including those in prison, rehabilitation and detention centres	As early as possible in dependence situation	III	40
	People who inject drugs	Needle and syringe programs should be made available to all populations, including prison populations	Opportunistic	IIA	55

*With **patient referral**, the index case contacts their own sexual contacts. In this circumstance, the health provider gives guidance on the advice to be translated to partners. This may also include 'patient-delivered partner therapy' (such as azithromycin for chlamydia). Another form of contact tracing is through **provider referral**, whereby the patient provides the healthcare provider with the contact details for their sexual partners. This allows for confidential contact tracing and is the method of choice for serious infections such as HIV.

Recommendations: Sexually transmitted infections					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening – chlamydia	All people aged 15–30 years if sexually active All people aged >30 years if sexually active and at high risk (Box 1)	Recommend nucleic acid amplification tests (NAAT) via: • (for women) endocervical swab if having a concurrent speculum examination, or self-administered vaginal swab, or first void urine • (for men) first void urine	Annually	GPP (to age 25 years) GPP (25–29 years)	56, 57
	All pregnant women		First visit		
	Pregnant women at high risk of STI (Box 1)		First visit and again in third trimester		
	Women having a termination of pregnancy		Opportunistic		
	Men who have sex with men in the presence of other risk factors (Box 1)	Recommend first void urine, throat and anal swab for chlamydia NAAT	Annually or 3–6-monthly if high risk (Box 1)	GPP	58

Recommendations: Sexually transmitted infections					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening – gonorrhoea	All people aged 15–30 years if sexually active Pregnant women who are at risk (Box 3) All people aged >30 years if sexually active and at high risk (Box 1)	Recommend gonorrhoea NAAT via samples as for chlamydia Include screening for chlamydia infection (as above)	Annually	GPP	57, 59, 60
	Men who have sex with men	Recommend gonorrhoea NAAT using first void urine Include throat swab NAAT and culture, plus anal swab NAAT and culture	Annually or 3–6-monthly if high risk (refer to Box 1)	GPP	61
Screening – trichomoniasis	All sexually active people aged ≤30 years in regional/remote areas or where local prevalence rates are high	Recommend NAAT for women (as above) and first void urine NAAT for men	Annually	GPP	59
Screening – syphilis	All pregnant women	Recommend syphilis serology (refer to Chapter 2: Antenatal care)	At first visit Repeat at 28 weeks' gestation if in a high prevalence area, or if risk factors for STIs are present	II–IV	62
	Men who have sex with men Others at high risk of STI (Box 1)	Recommend syphilis serology	Annually or 3–6-monthly if high risk (Box 1)	IB	56

Recommendations: Blood-borne viruses					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Immunisation – hepatitis B virus (HBV)	Neonates	Recommend hepatitis B vaccination as per National Immunisation Program Schedule (NIPS)	At birth prior to leaving hospital, and at two, four and six months	I GPP	63, 64
	Babies born to mothers who are hepatitis B virus surface antigen (HBsAg) positive	Recommend HBV immunoglobulin and vaccination at birth Complete primary course of vaccination, followed by testing for anti-HBs and HBsAg at age 3–12 months after completing vaccination	Hepatitis B immunoglobulin (HBIG) ideally within 12 hours and certainly within 48 hours of birth. HBV vaccine preferably within 24 hours and certainly within seven days of birth	I	25, 65

Recommendations: Blood-borne viruses					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Immunisation – hepatitis B virus (HBV)	Adults who have not previously been vaccinated against hepatitis B and are non-immune	Recommend hepatitis B vaccination	Three doses – refer to *The Australian immunisation handbook*	IB	63
	Healthcare workers, sex workers, those at risk of severe or complicated disease, haemodialysis patients, sexual partners and household contacts of people recently identified as hepatitis B carriers	Test for sero-conversion	4–8 weeks after the last dose	GPP	
	Individuals exposed to a person who is HBsAg positive or who is at high risk of HBV infection and is unable to be identified and tested rapidly	Offer HBV post-exposure prophylaxis (PEP) (HBIG and primary course of vaccination) for non-immune people	Initiate within 72 hours (or 14 days for sexual contact)	IIC	25
	People with hepatitis C virus (HCV) infection or chronic liver disease who are non-immune to hepatitis B	Recommend hepatitis B vaccination	Three doses – refer to *The Australian immunisation handbook*	IIC	25,66–68
Immunisation – human papillomavirus (HPV)	Young people prior to first sexual activity Females who are sexually active and have not yet been vaccinated	Recommendations vary with age, sexual orientation and gender (consult *The Australian immunisation handbook*, chapter 4.6 for more information)	Children aged 9–18 years – refer to *The Australian immunisation handbook*	GPP	25, 50, 69, 70
Immunisation – hepatitis A virus (HAV)	Men who have sex with men Injecting drug users People with chronic HBV or HCV infection	Recommend testing for hepatitis A immunity and offer hepatitis A vaccination if non-immune	Two doses – refer to *The Australian immunisation handbook*	GPP	25, 71

Recommendations: Blood-borne viruses					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening – HBV	Non-vaccinated or vaccine status unknown People at high risk for BBVs (Box 1) Healthcare workers	Offer HBV screening with: • HBsAg (a marker of acute or chronic infection) • hepatitis B surface antibody (HBsAb) (marker of immunity either from vaccine or infection) If non-immune, offer hepatitis B vaccination as above	Opportunistic and as part of an annual health assessment	GPP	72–74
	All pregnant women	Recommend HBV screening to allow timely HBV vaccination and HBIG for infant at birth (if necessary), and offer antiviral treatment for mother during pregnancy if HBsAg positive and HBV DNA >106 copies/ml[75] (refer to Chapter 2: Antenatal care)	At first antenatal visit	I–III	75, 76
Screening – HCV	People at high risk for contracting hepatitis C infection (Box 1)	Offer HCV serology testing	Opportunistic and as part of annual health assessment	IIIA	71
	Infants born to HCV-infected mothers	Offer HCV serology testing	Age 18 months (repeat if positive)	IIIA	71, 77
Screening – human immunodeficiency virus (HIV)	Pregnant women	Offer HIV serology testing	At first antenatal visit	III–IV	62
	Men who have sex with men, and others at high risk of BBVs (Box 1)		As part of annual health assessment and 3–6-monthly		

Box 1. Risk factors for sexually transmitted infections and blood-borne viruses[6]

Risk factors for sexually transmitted infections (STIs)

- Age <30 years
- Age <39 years and sexual network relates to a remote community
- Multiple current partners
- High rate of partner change
- Engaging in group sex
- New partner
- Using condoms inconsistently
- Live in and have sex with people from areas with a high incidence of STIs
- Having sex while under the influence of drugs and alcohol
- Having sex in exchange for money or drugs
- Prison incarceration
- Victims of sexual assault
- Men who have sex with men where any of the above risk factors are also present

Risk factors for blood-borne viruses (BBVs)

- Prison incarceration – current or past
- Blood transfusion prior to 1990
- Tattoos or piercings not performed professionally
- Cultural practices
- Current or past injecting drug use
- Household member with HBV
- Sexual partner with HBV, HCV or HIV
- Infants of mothers infected with HBV, HCV or HIV
- Persons born in regions with a ≥2% prevalence of chronic HBV infection
- Candidates for immunosuppressive therapy

HBV, hepatitis B virus; HCV, hepatitis C virus; HIV, human immunodeficiency virus

Box 2. Strategies and questions for asking about sexually transmitted infection risk[6]

- Ask a health worker of the same gender to help
- Ask someone experienced in your clinic for ideas
- Use simple explanations before asking screening risk questions – for example:
  - *In our region there are a lot of infections you can get from sex. Some can stop you having kids. Most people don't know they have them, but there are good medicines to fix them. So, I'm going to ask you some questions now about sex, to see whether it's a good idea to check you for them with a simple pee and blood test.*
  - Questions: *Do you have a regular partner? Any other partners? Were your partner(s) male or female? Where was he/she from? How many partners have you had in the last six months? Did you use condoms? What kind of sex did you have?*

Resources

Sexually transmitted infections and blood-borne viruses resources

- Australasian Society for HIV Medicine (ASHM), *HIV, viral hepatitis and STIs: A guide for primary care*, https://ashm.blob.core.windows.net/ashmpublic/HIV_Viral_Hepatitis_and_STIs_a_Guide_for_Clinical_Care_(4th_Edition).pdf
- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM), *HIV pre-exposure prophylaxis: Clinical guidelines*, http://viruseradication.com/journal-details/Australasian_Society_for_HIV,_Viral_Hepatitis_and_Sexual_Health_Medicine_HIV_pre-exposure_prophylaxis:_clinical_guidelines#main
- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM), *Antiretroviral guidelines*, http://arv.ashm.org.au/arv-guidelines/prep-resources-for-clinicians
- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM), *Australian national guidelines: Post-exposure prophylaxis after non-occupational and occupational exposure to HIV*, 2nd edition, www.pep.guidelines.org.au
- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM), *Australian contact tracing guidelines*, http://contacttracing.ashm.org.au
- Australasian Sexual Health Alliance, *Australian STI management guidelines for use in primary care*, www.sti.guidelines.org.au/populations-and-situations/aboriginal-and-torres-strait-islander
- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM), *B positive: All you wanted to know about hepatitis B: A guide for primary care providers*, www.hepatitisb.org.au
- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM), search for BBV and STI training online or at a specific location, www.ashm.org.au/training
- Hepatitis C Virus Infection Consensus Statement Working Group, *Australian recommendations for the management of hepatitis C virus infection: A consensus statement* (August 2017), www.hepcguidelines.org.au
- The Kirby Institute, *Bloodborne viral and sexually transmitted infections in Aboriginal and Torres Strait Islander people: Annual surveillance report 2016*, https://kirby.unsw.edu.au/sites/default/files/kirby/report/ATSIP_2016-Aboriginal-Surveillance-Report_UPD170116.pdf

STIs – State-specific resources

- Queensland: Sexual health clinical management guidelines, www.health.qld.gov.au/clinical-practice/guidelines-procedures/sex-health/guidelines
- Western Australia: Silver book – *Guidelines for managing sexually transmitted infections and blood-borne viruses*, http://silverbook.health.wa.gov.au/Default.asp?PublicationID=1&SectionID=74
- Northern Territory: *Central Australian Rural Practitioners standard treatment manual 2015*, https://docs.remotephcmanuals.com.au/review/g/manuals2017-manuals/d/20317.html?page=1 updated

STIs – International resources

- British Association for Sexual Health and HIV (BASHH), *Sexually transmitted infections: UK national screening and testing guidelines*, www.bashh.org/documents/59/59.pdf
- Scottish Intercollegiate Guidelines Network (SIGN), *Management of genital Chlamydia trachomatis infection: A national clinical guideline*, www.sign.ac.uk/assets/sign109.pdf

Drug use resources

- NSW Government Department of Health, *Drug and alcohol psychosocial interventions professional practice guidelines*, www1.health.nsw.gov.au/PDS/pages/doc.aspx?dn=GL2008_009
- Drug and Alcohol Office, *A counsellor's guide to working with alcohol and drug users*, 2nd edition, www.researchgate.net/profile/Ali_Dale/publication/265422520_A_Counsellor%27s_Guide_to_Working_with_Alcohol_and_Drug_Users_2_nd_edition/links/54d556b00cf2970e4e64bd91/A-Counsellors-Guide-to-Working-with-Alcohol-and-Drug-Users-2-nd-edition.pdf
- National Institute for Health and Care Excellence (NICE), *Drug misuse in over 16s: Psychosocial interventions*, Clinical Guideline 51, www.nice.org.uk/guidance/CG51/NICEGuidance
- World Health Organization, *Guidelines for the psychosocially assisted pharmacological treatment of opioid dependence*, http://whqlibdoc.who.int/publications/2009/9789241547543_eng.pdf

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Chapter 15: Prevention and early detection of cancer

Overview

Cancer is estimated to cause 9% of the burden of disease for Aboriginal and Torres Strait Islander peoples, and accounts for 9% of the health gap between Aboriginal and Torres Strait Islander peoples and the non-Indigenous population. Aboriginal and Torres Strait Islander peoples have a 1.7 times higher burden of disease due to cancer when compared to the non-Indigenous population.[1]

Inadequate recording of Aboriginal and Torres Strait Islander status on cancer registries and in death registers in many jurisdictions means that reported statistics on cancer incidence and mortality are likely to underestimate true rates of cancer. Aboriginal and Torres Strait Islander peoples have a higher incidence of preventable cancers, such as lung, cervical and liver cancer. In addition, due to later diagnosis and poorer access to adequate treatment, Aboriginal and Torres Strait Islander peoples have higher case fatality rates for many cancers compared to the rest of the population.[2–4]

Cancer incidence and mortality

Overall, the most recent analysis reports an age-standardised incidence rate for cancer that is 10% higher for Aboriginal and Torres Strait Islander peoples compared to non-Indigenous people. The most commonly diagnosed cancer in Aboriginal and Torres Strait Islander peoples for 2008–12 was lung cancer (average of 173 cases per year), followed by breast cancer in females (143), colorectal cancer (116) and prostate cancer (101). Age-standardised incidence rates are higher in Aboriginal and Torres Strait Islander peoples for liver cancer (2.8 times as high), cervical cancer (2.2), lung cancer (2.0), cancer of unknown primary site (1.9), uterine cancer (1.7) and pancreatic cancer (1.4) when compared to non-Indigenous people.[3] Conversely, age-standardised incidence rates for Aboriginal and Torres Strait Islander peoples are lower for colorectal cancer and breast cancer in females (rate ratio of 0.9), non-Hodgkin lymphoma (0.8) and prostate cancer (0.7) when compared to non-Indigenous people. Some of this may be attributable to lower uptake of screening by Aboriginal and Torres Strait Islander peoples.[3]

Age-standardised mortality rates are higher for Aboriginal and Torres Strait Islander peoples compared to non-Indigenous people for cervical cancer (3.8 times as high), liver cancer (2.5), lung cancer (1.8), uterine cancer and cancer of unknown primary site (both 1.6) and pancreatic cancer (1.3).[3] The age-standardised mortality rate was lower for Aboriginal and Torres Strait Islander peoples Australians than for non-Indigenous Australians for colorectal cancer (rate ratio 0.7).[5]

Prevention and early detection of cervical cancer

Background

The incidence of cervical cancer in Aboriginal and Torres Strait Islander women is 2.2 times higher than in non-Indigenous women. Cervical cancer mortality is 3.8 times higher in Aboriginal and Torres Strait Islander versus non-Indigenous women.[3]

Interventions

Vaccination against human papillomavirus (HPV) is recommended due to the link between cervical HPV infection and the development of cervical dysplasia. As the vaccine works by preventing HPV infection and cervical dysplasia, and cannot treat existing HPV infection or disease, vaccination is ideally given prior to onset of sexual activity, or otherwise as early as possible. The HPV vaccine is provided free in schools to all males and females aged 12–13 years under the National HPV Vaccination Program. Some older women

and men at higher risk of HPV-related cancers may also benefit from HPV vaccination, which may be funded in some states through catch-up programs if adolescent vaccination was missed. Refer to *The Australian immunisation handbook* for more details.[6]

Pap smears have been shown to reduce the risk of developing cervical cancer due to detecting and treating cervical changes before they develop into invasive cancer, with 80% of cervical cancers occurring in women who have never been screened or who have not had timely screening. In 2014–15 in Australia, 57% of the target population participated in screening.[3] National participation rates have remained stable over the last 10 years, with participation rates tending to be lower in lower socioeconomic groups and remote areas.[7] Cervical screening state registers have not systematically collected information on the Aboriginal and Torres Strait Islander status of women screened[3] because pathology report forms, the main data source for the registers, do not collect Aboriginal and Torres Strait Islander status. This is expected to change with the commencement of the national cancer screening register.[8]

Aboriginal and Torres Strait Islander women tend to have lower participation rates in cervical screening programs, with studies finding participation rates that are 30–50% lower than for non-Indigenous women.[9–11] One study recently showed a higher rate of screen-detected low-grade and high-grade lesions and histologically confirmed high-grade lesions.[12]

In one jurisdiction, it was found that Aboriginal and Torres Strait Islander women who participated in cervical screening appeared to participate just as regularly as non-Indigenous women, indicating that increasing the participation among Aboriginal and Torres Strait Islander women who never screen is critical to improving participation rates and cancer outcomes. Factors that may increase participation of Aboriginal and Torres Strait Islander women in cervical cancer screening are inclusion of cervical screening programs within primary healthcare services; culturally appropriate care; appropriate staff, including female staff, and involvement of Aboriginal health workers; community participation; linkages between services; continuous quality improvement activities; reminder letters and patient educational events.[9,13–17] The Practice Incentives Program (PIP) currently provides financial incentives for accredited health services to provide cervical screening, including additional incentives for screening in under-screened women. This will change with the implementation of a quality improvement PIP in mid-2018.[18]

The **National Cervical Screening Program** changed on 1 December 2017. The Pap smear test has been replaced by a new HPV cervical screening test with reflex liquid-based cytology (LBC) for oncogenic HPV positive samples. Evidence shows that HPV-based cervical screening is more sensitive than Pap smear screening, will detect high-grade cervical lesions earlier, and will prevent more cervical cancers. Other program changes include five-yearly HPV screening from age 25 years (or two years after commencing sexual activity, whichever is later) with an exit test for women between the ages of 70 and 74 years. For women with previously normal Pap smears, the new test will be performed two years after the last Pap test. For women with positive HPV and LBC results or with recent abnormalities under the previous Pap smear-based cervical screening program, new guidelines are available online with details of further screening and follow-up recommendations – refer to 'Resources'.[19,20]

There is no evidence to suggest that receiving an HPV positive test result would be any different to receiving an abnormal Pap test result for Aboriginal and Torres Strait Islander women. Cervical screening providers and other relevant health service staff should discuss HPV in terms of being the most common sexually transmitted infection (STI) that affects most sexually active people at some point in their life, explain the renewed cervical screening program using the HPV test, and answer questions that patients may have about the test. Specific educational information for Aboriginal and Torres Strait Islander women may be useful once developed.[20]

Cervical screening self-collection – for women who are under-screened (aged >30 years and never screened, or >30 years and two years or more overdue for screening), the cervical screening provider is able to offer the option of a self-collected HPV test in the clinic once testing arrangements are finalised in 2018. The self-collected test has slightly reduced sensitivity – that is, it may be slightly more likely to miss picking up cervical HPV than a clinician-collected sample, but is preferable to remaining unscreened. Under-screened women who elect to perform self-sampling should be encouraged to have a clinician-collected sample when next due. For women with an oncogenic HPV-positive (type 16 or 18) result on a self-collected test, it is recommended that they are referred directly for colposcopy with LBC to be collected at colposcopy; women with HPV-positive (not type 16 or 18) result on a self-collected sample are recommended to return for a

clinician-collected LBC test – refer to National Cervical Screening Program guidelines for further management.[20]

Women vaccinated against HPV should follow the same cervical screening recommendations as unvaccinated women because the vaccine does not cover all strains of HPV that cause cervical cancer, and some women may have been exposed to HPV prior to being vaccinated.[20,21]

Symptomatic women – cervical screening recommendations apply to asymptomatic women. Women with symptoms or abnormalities of the cervix on examination should be investigated appropriately and referred for specialist review and treatment as required.

Assess smoking status – smoking is a risk factor for development of cervical cancer. Refer to 'Recommendations' for more detail.

Recommendations: Prevention and early detection of cervical cancer

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Immunisation	Adolescents (girls and boys) aged 9–18 years	Promote human papillomavirus (HPV) vaccination for the prevention of cervical cancer – ideally age 11–13 years, prior to onset of sexual activity (Can be accessed through National Immunisation Program [NIP] – school vaccination programs or through clinic/ community services for those aged 10–15 years, timing depending on state or territory) Vaccination up to age 18 years is recommended but should include discussion of potential benefit based on risk of previous exposure	As per National Immunisation Program Schedule (NIPS) (varies between states and territories)[22]	IIB	6, 23
	Women and men aged ≥19 years (not subsidised through the NIPS – check state/ territory rules regarding catch-up programs)	Vaccination of all women and men against HPV not recommended – conduct individual risk and benefit assessment	As per *The Australian immunisation handbook*	IIB	6
	Men who have sex with men (not subsidised through the NIPS – check state/ territory rules regarding catch-up programs)	4vHPV vaccine recommended for men who have not been vaccinated, but should take into account likelihood of past exposure to HPV and risk of future exposure	As per *The Australian immunisation handbook*	IIB	6
Screening	Asymptomatic women aged 25–69 years who have ever been sexually active	Offer cervical screening test (HPV) from age 25 years (or two years after commencing sexual activity, whichever is later) regardless of whether HPV vaccination has been given Note: As of 1 December 2017, Pap smears are no longer recommended as a screening test for cervical cancer	Every five years	II, III–IIA	24–27

Recommendations: Prevention and early detection of cervical cancer					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	Asymptomatic women aged 70–74 years who have ever been sexually active	Exit cervical screening test (HPV) for those who have been regularly screened	Exit test between ages 70 and 74 years	III–IIA	24, 25
	Asymptomatic under-screened women – women who are 30 years of age and have never been screened or women aged ≥30 years who are at least two years late for cervical screening	Offer clinician-collected cervical screening test (HPV). If declined, recommend self-collected sample (should become available in 2018) and explain slightly lower accuracy of testing. Inform clients on the recommendation for clinician-collected liquid-based cytology (LBC) sample or colposcopy if self-collected sample is oncogenic HPV positive	Promote cervical screening if overdue, and then routine five-yearly screening if negative	II, III–IIA	28
	Women with recent abnormal Pap smears, previously treated for high-grade squamous intraepithelial lesion (HSIL), or at high risk of cervical abnormalities (eg immune suppression, in-utero exposure to diethylstilbestrol [DES])	Screening recommendations are more complex and recommend consultation of guidelines for higher risk groups – refer to 'Resources'	Follow-up intervals vary by condition	II, III–IIC	24, 28
Behavioural	All women	Assess smoking status and advise that smoking increases risks of cervical dysplasia and cervical cancer (refer to Chapter 1: Lifestyle, 'Smoking')	As part of annual health assessment	III–IIB	29, 30
		Offer a sexual health review (refer to Chapter 14: Sexual health and blood-borne viruses)	As part of annual health assessment	GPP	

Resources

- Cancer Council Australia, *National Cervical Screening Program: Guidelines for the management of screen-detected abnormalities, screening in specific populations and investigation of abnormal vaginal bleeding*, http://wiki.cancer.org.au/australia/Guidelines:Cervical_cancer/Screening
- Department of Health, National Cervical Screening Program – clinical guidelines and resources for cervical screening program from 1 December 2017, www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/cervical-screening-1
- The Australian Technical Advisory Group on Immunisation (ATAGI), *The Australian immunisation handbook*, Chapter 4.6: Human papillomavirus, www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home~handbook10part4~handbook10-4-6

Prevention and early detection of primary liver (hepatocellular) cancer

Background

Aboriginal and Torres Strait Islander peoples have an incidence of primary liver cancer that is 2.8 times higher and a mortality rate that is 2.5 times higher than that of the non-Indigenous population.[3] Some regions may have even higher rates; for example, in the Northern Territory the age-standardised incidence rates are 5.9 times higher in Aboriginal peoples than in the non-Indigenous population.[31,32]

Hepatocellular carcinoma (HCC), responsible for the vast majority of primary liver cancer, is almost always preceded by cirrhosis. Major risk factors for cirrhosis (and therefore HCC) in Australia are chronic hepatitis B and C infection, alcoholic liver disease and fatty liver disease. Some people with hepatitis B may develop HCC without previous cirrhosis.

Reporting of Aboriginal status for hepatitis B virus (HBV) and hepatitis C virus (HCV) infection continues to be a problem, with notifications of newly acquired infections missing recording of Aboriginal status in 63% and 59% of cases respectively.[33] From the limited data available, it appears that for Aboriginal and Torres Strait Islander peoples the notification rate for newly acquired HBV is three times, and for newly acquired HCV nearly five times, that of the non-Indigenous population. In addition, evidence of HCV infection acquired in the last two years is 17 times higher compared to the non-Indigenous population.[33] While Aboriginal peoples make up 3% of the Australian population, they accounted for 10% of newly acquired HBV infections and 30% of newly acquired HCV infections. For Aboriginal and Torres Strait Islander peoples, notification rates for newly diagnosed HBV are declining, perhaps reflecting the impact of vaccination programs. Conversely, incidence rates of HCV are increasing, perhaps due to higher rates of injecting drug use with needle sharing.[33]

Risk factors for HBV infection include: non-immune household or sexual contacts of people with HBV; Aboriginal people; babies born to mothers with HBV infection; people with multiple sexual partners; men who have sex with men; people who inject drugs; people at occupational risk; people in prison/detention; people with chronic liver disease, HCV, HIV or impaired immunity.[6]

Risk factors for HCV infection include: people who have ever injected drugs; people who have been incarcerated; children of HCV-positive mothers; people with tattoos and body piercings; recipients of blood products, tissues or organs prior to February 1990 in Australia or anytime overseas; men who have sex with men with HIV.[34]

Interventions

HBV vaccination reduces the risk of chronic HBV infection, which is a risk factor for the development of HCC. Aboriginal people are considered by the World Health Organization to be a priority group for HBV due to its intermediate to high endemicity.[35] Universal infant vaccination is available through the National Immunisation Program (NIP).[36] Vaccination for other groups may be funded through state and territory health department programs.

Hepatitis B antiviral therapy for those with chronic hepatitis B reduces liver disease progression and risk of HCC. A minority of people with chronic hepatitis B require therapy (10–20%), as most people have non-active disease, with low risk of disease progression. Licensed therapies are able to be prescribed by trained doctors in the community through the section 100 (S100) scheme.

Hepatitis C antiviral therapy for those with chronic hepatitis C is curable in the vast majority of cases (>95%), and thereby reduces liver disease progression and risk of HCC. All adults with chronic hepatitis C are eligible for treatment, with multiple regimens available through the Pharmaceutical Benefits Scheme (PBS), including interferon-free regimens that are highly efficacious and tolerable with treatment courses ranging from 8–24 weeks. These regimens can now be prescribed by general practitioners (GPs) who are experienced in this area, without mandated further training, or otherwise prescribed by GPs in consultation with a specialist, and dispensed in the community through the section 85 (S85) scheme.[37] Refer to the end of this section for links to clinical guidelines.

Recommendations: Prevention and early detection of primary liver (hepatocellular) cancer					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Immunisation	All people	Recommend hepatitis B vaccination as per the National Immunisation Program Schedule (NIPS) and also offer immunisation to any non-infected, non-immune individuals (refer to 'Recommendations' in Chapter 14: Sexual health and blood-borne viruses, and in Chapter 3: Child health)	Refer to Chapter 3: Child health, and Chapter 14: Sexual health and blood-borne viruses Shortly after birth, and at age two, four and six months Catch-up program for non-immune people (may be funded in some jurisdictions)	Refer to Chapter 14	6, 38
Screening	All people	Screen for hepatitis B and C if indicated (refer to Chapter 14: Sexual health and blood-borne viruses, 'Recommendations')	Chapter 14: Sexual health and blood-borne viruses	Refer to Chapter 14	6, 34, 39, 40
	People with chronic hepatitis B who are: Aboriginal and/or Torres Strait Islander and >50 years, or have cirrhosis, or have a family history of hepatocellular carcinoma (HCC)	Recommend abdominal ultrasound, alpha-fetoprotein screening for HCC as part of specialist management plan	Six-monthly	III–IIC	41–43
	People with advanced liver disease (cirrhosis) not due to chronic hepatitis B	Recommend specialist review and consider ongoing screening for HCC with an abdominal ultrasound +/– alpha-fetoprotein	Protocols vary (consult clinical guidelines for more detail – refer to 'Resources')	III–IIC	41–50
Behavioural	Adolescents and adults	Assess quantity and frequency of alcohol consumption and advise about safer levels of alcohol consumption to reduce long-term risk of alcohol-related harm (refer to Chapter 1: Lifestyle, 'Alcohol'; and Chapter 4: The health of young people)	As part of annual health check	IIIB	51
	People with overweight/obesity	Advise of the risks of liver disease and promote weight reduction strategies (refer to Chapter 1: Lifestyle, 'Overweight and obesity')	Opportunistic and as part of annual health check	GPP	52

Recommendations: Prevention and early detection of primary liver (hepatocellular) cancer					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	People at higher risk of hepatitis B or C infection	Provide counselling on harm minimisation and promote peer education strategies around safer sex and injecting drug use where relevant (refer to Chapter 14: Sexual health and blood-borne viruses)	Opportunistic and as part of annual health check	GPP	40
	People with chronic liver disease or chronic hepatitis infection	Provide counselling regarding risks of alcohol consumption	6–12-monthly, as required	GPP	43, 46, 49
Chemo-prophylaxis	People with chronic hepatitis B infection	Assess disease severity and suitability for anti-viral treatment Regular monitoring for disease progression is recommended	Refer to Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM) management guidelines listed in 'Resources', and/or contact local services for advice	IB	41–43, 53
	People with chronic hepatitis C infection	Assess disease severity and suitability for anti-viral treatment	Refer to ASHM management guidelines listed in 'Resources', and/or contact local specialist services for advice	IIB	46, 48, 49

Resources

- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM), guidelines on hepatitis B diagnosis and treatment for primary care, including quick reference guides and information about training, www.ashm.org.au/HBV
- Australasian Society for HIV, Viral Hepatitis and Sexual Health Medicine (ASHM), guidelines on hepatitis C diagnosis and treatment for primary care, including quick reference guides and information about training, www.ashm.org.au/HCV
- The Australian Technical Advisory Group on Immunisation (ATAGI), *The Australian immunisation handbook*, Chapter 4.5: Hepatitis B, www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home~handbook10part4~handbook10-4-5

Prevention and early detection of breast cancer

Background

Breast cancer is the most common cancer diagnosed in Aboriginal and Torres Strait Islander women.[54] The age-standardised incidence of breast cancer is estimated to be 10% lower for Aboriginal and Torres Strait Islander women compared to non-Indigenous women, with mortality rates similar.[3]

Aboriginal and Torres Strait Islander women have lower participation rates in mammographic screening programs. The estimated participation of self-identified Aboriginal and Torres Strait Islander women in the BreastScreen program for the target age range of 50–69 years was 37% in the two years 2013–14, compared to 54% for non-Indigenous women in the same period, which is similar to the 2011–12 findings.[3,55]

Estimating risk based on family history

Calculators to estimate the risk of breast cancer based on family history are available. The online calculator (refer to 'Resources') provides the most accurate breast cancer risk calculation. However, Box 1 highlights risk categories based on the Cancer Australia recommendations and is provided for situations where the online resource may not be available. For women at potentially higher-than-average risk based on family or personal history of breast or ovarian cancer, referral for specialist advice and testing should be considered.[56–59]

Interventions

Mammographic screening for women at average or slightly above average risk is currently recommended for women aged 50–74 years, and is available but not routinely recommended for women at average risk aged 40–49 years due to a much smaller benefit than for older women. Routine mammographic screening is not recommended for women aged <40 years as there is no evidence of effectiveness and screening results in many false positive mammograms. Mammographic screening in women aged 40–74 years has been shown to reduce breast cancer mortality; however, there are harms associated with overdiagnosis and overtreatment of breast cancer, including psychological effects and costs of investigation for false positive results, and for breast cancers that may never become clinically significant.[60,61]

Since the start of mammographic screening, breast cancer treatment has improved, which has contributed to reduced mortality rates. In Australia, it is estimated that for every 1000 women who are asymptomatic and at average risk who are screened biannually with mammography from age 50 to 74 years, eight deaths will be prevented and approximately eight (range 2–21) women will be diagnosed with cancer that would not otherwise have been found in their lifetime. It should be noted that the risk of breast cancer increases from age 40 to 74 years, thus there is a greater benefit from screening older women in this age range. Women should be provided with information to allow an informed decision based on their individual risk and preferences. Mammographic screening is not routine for women aged ≥75 years as there is no evidence it is effective in reducing breast cancer mortality, and other health issues need to be taken into account. Patient decision-aid tools may be helpful in discussing risks and benefits of breast screening with individual women.[60–65]

Participation in mammographic screening may be improved by organised client reminder and recall systems.[66] Strategies to increase participation of Aboriginal and Torres Strait Islander women need to be tailored to suit local circumstances, including provision of appropriate information on prevention and early detection of breast cancer, female health staff, collaboration between Aboriginal health services and BreastScreen Australia, use of mobile screening units and coordination of screening with health assessment recalls.[13,15]

Magnetic resonance imaging (MRI) screening combined with clinical examination and/or other imaging techniques is more sensitive in women aged <50 years at high risk of breast cancer. MRI may be considered as part of a specialist review. A Medicare rebate is only available when patients meet the criteria and are referred for this test by a specialist or consultant physician.[67,68]

Regular breast examination is not recommended. Population screening for women at average risk with regular clinical breast examination is not recommended due to lack of evidence that it reduces mortality from

breast cancer.[61,69–71] Regular breast self-examination cannot be recommended due to lack of evidence that it reduces mortality from breast cancer. Women should be 'breast aware' (ie know what their breasts are usually like) and be reviewed and investigated if any breast symptoms are noted.[69–72]

Hormone replacement therapy (HRT) may be considered for intolerable peri-menopausal symptoms if not contraindicated and after discussion of risks and benefits to allow an informed decision to be made about use. Combined HRT (ie oestrogen and progesterone) at or around time of menopause increases the risk of breast cancer. The risk increases with duration of use, especially after five years' use. For women who have had a hysterectomy, oestrogen-only HRT may be a better choice as evidence shows a non-statistically significant reduction in breast cancer risk after seven years' use, and overall a more favourable risk profile.[73]

Chemoprophylaxis (eg with tamoxifen and raloxifene, aromatase inhibitors such as exemestane and anastrozole) has shown some benefits in preventing breast cancers and may be useful in those at moderate to high risk, although these medications have a risk of adverse effects. Currently (January 2018) only tamoxifen has PBS approval for primary prevention of breast cancer in women at moderate or high risk of breast cancer.[68,74–77]

Risk-reducing surgery may also be an option for high-risk women, although the effect of this on mortality is uncertain.[58,78]

Box 1. Breast cancer risk categories based on family history[56]

1. At or slightly above average risk

Covers more than 95% of the female population

As a group, risk of breast cancer up to age 75 is between 1 in 11 and 1 in 8. This risk is no more than 1.5 times the population average.

- No confirmed family history of breast cancer
- One 1° relative diagnosed with breast cancer at age 50 or older
- One 2° relative diagnosed with breast cancer at any age
- Two 2° relatives on the same side of the family diagnosed with breast cancer at age 50 or older
- Two 1° or 2° relatives diagnosed with breast cancer, at age 50 or older, but on different sides of the family (ie one on each side of the family)

2. Moderately increased risk

Covers less than 4% of the female population

As a group, risk of breast cancer up to age 75 is between 1 in 8 and 1 in 4. This risk is 1.5 to 3 times the population average.

- One 1° relative diagnosed with breast cancer before the age of 50 (without the additional features of the potentially high-risk group – refer to category 3)
- Two 1° relatives, on the same side of the family, diagnosed with breast cancer (without the additional features of the potentially high-risk group – refer to category 3)
- Two 2° relatives, on the same side of the family, diagnosed with breast cancer, at least one before the age of 50, (without the additional features of the potentially high-risk group – refer to category 3)

Box 1. Breast cancer risk categories based on family history[56] (continued)

3. Potentially high risk

Covers less than 1% of the female population

As a group, risk of breast cancer up to age 75 is between 1 in 4 and 1 in 2. Risk may be more than 3 times the population average. Individual risk may be higher or lower if genetic test results are known.

- Women who are at potentially high risk of ovarian cancer
- Two 1° or 2° relatives on one side of the family diagnosed with breast or ovarian cancer plus one or more of the following on the same side of the family:
  - additional relative(s) with breast or ovarian cancer
  - breast cancer diagnosed before the age of 40
  - bilateral breast cancer
  - breast and ovarian cancer in the same woman
  - Jewish ancestry
  - breast cancer in a male relative.
- One 1° or 2° relative diagnosed with breast cancer at age 45 or younger plus another 1° or 2° relative on the same side of the family with sarcoma (bone/soft tissue) at age 45 or younger.
- Member of a family in which the presence of a high-risk breast cancer gene mutation has been established.

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Recommendations: Prevention and early detection of breast cancer

Prevention intervention type	Who is at risk?*	What should be done?	How often?	Level/ strength of evidence	References
Screening	All women	Ask about family history of breast cancer to ascertain the individual risk of developing breast cancer (refer to Box 1 and to 'Resources' for online calculator and more detail)	As part of annual health assessment	GPP	56–59
		Discuss 'breast awareness' rather than promoting regular breast self-examination and ask women to promptly report persistent or unusual changes Note: Women with symptoms should be investigated rather than screened for breast cancer		II, III–IIC	69–72, 79, 80
	Women aged 40–49 years at or slightly above average risk*	Routine mammographic screening is not recommended If requested, provide information about mammographic screening to allow an informed decision based on individual risk and preferences		I, III–IIB	60–65, 81
	Women aged 40–49 years at moderately increased risk*	Consider annual mammography starting at age 40 years if relative with breast cancer aged <50 years Consider referral to family cancer clinic or specialist cancer clinic, where available, for further assessment of risk of developing cancer and advice about genetic testing, screening and prevention	Every 1–2 years	GPP	56, 68

Recommendations: Prevention and early detection of breast cancer					
Prevention intervention type	**Who is at risk?***	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	Women aged 50–74 years at or slightly above average risk*	Recommend mammography screening and provide information to allow an informed decision based on individual risk and preferences Consider use of a decision aid to facilitate these discussions (refer to 'Resources')	Every two years	I, III–IIB	60–65, 81
	Women aged 50–69 years at moderately increased risk*	Recommend routine mammography screening. Consider annual mammography if relative with breast cancer aged <50 years Consider referral to family cancer clinic or specialist cancer clinic for further assessment of risk of developing cancer and advice about genetic testing, screening and prevention	Every 1–2 years	GPP	56, 68
	Women at potentially high risk of breast cancer*	Advise referral to a family cancer clinic for risk assessment, possible genetic testing and development of a management plan	When calculated to be at potentially high risk	GPP	56, 68
		Screening may involve magnetic resonance imaging (MRI) if aged <50 years, ultrasound, mammography and clinical breast examination. Specialist referral is required to claim a Medicare rebate for MRI	Consider annual screening depending on specialist advice	III–IIB	56, 67, 68
Behavioural	All women	Provide lifestyle risk factor counselling on the benefits of regular physical activity, maintaining healthy weight, alcohol intake in the low-risk range, avoiding smoking, restricting energy intake and dietary fat (refer to Chapter 1: Lifestyle)	As part of annual health check assessment (refer to Chapter 1: Lifestyle)	III–IIB	82–85
	Pregnant and breastfeeding women	Advise that breastfeeding has been shown to reduce the risk of breast cancer, and support women to breastfeed their infants (refer also to Chapter 3: Child health, 'Anaemia')	During and following pregnancy	III–IIB	86, 87
	Women on combined hormone replacement therapy (HRT)	Advise about risks and benefits of combined HRT. In particular, advise about increased risk of breast cancer with continuous use for >5 years	When considering commencing HRT and every six months for women on combined HRT	I, III–IIA	73, 88
Chemo-prophylaxis	Women at potentially high risk, and women aged >35 years at moderate risk	Consider specialist referral to discuss preventive treatment with tamoxifen or raloxifene Tamoxifen is approved for subsidy under the PBS for the primary prevention of breast cancer and is able to be prescribed by GPs as well as medical specialists	When calculated to be at potentially high risk, and as needed	I, III–IIB	68, 74–77
*Refer to Box 1 for risk categories.					

Resources

- Cancer Australia, Familial Risk Assessment – Breast and Ovarian Cancer (FRA-BOC), online calculator, with additional family risk information, https://canceraustralia.gov.au/clinical-best-practice/gynaecological-cancers/familial-risk-assessment-fra-boc
- Cancer Australia, 'Advice about familial aspects of breast cancer and epithelial ovarian cancer', https://canceraustralia.gov.au/publications-and-resources/cancer-australia-publications/advice-about-familial-aspects-breast-cancer-and-epithelial-ovarian-cancer

- Cancer Council Australia, Family cancer clinics in Australia – counselling and information for families with a history of cancer on risk of inheriting cancer, screening recommendations, cancer risk reduction strategies, and genetic testing where appropriate, www.cancer.org.au/about-cancer/causes-of-cancer/family-cancers/family-cancer-clinics-in-australia.html
- BreastScreen Australia, BreastScreen and you: Information about mammographic screening – screening decision tools to help discussion when considering risk and benefit from breast screening, www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/breastscreen-and-you

Prevention and early detection of colorectal (bowel) cancer

Background

Colorectal cancer is the third most common cancer diagnosed in Aboriginal and Torres Strait Islander peoples. Recent reports show that the incidence rate for Aboriginal and Torres Strait Islander peoples for colorectal cancer is 10% less than for non-Indigenous Australians, with a mortality rate 30% lower.[3] The participation rate for Aboriginal and Torres Strait Islander peoples in bowel screening is not routinely reported.[89] One review of participation in the National Bowel Cancer Screening Program estimated that the participation rate for non-Indigenous Australians was 2.1 times greater than for Aboriginal and Torres Strait Islander peoples.[90]

The lower participation of Aboriginal and Torres Strait Islander peoples in the bowel cancer screening program may be due to lack of awareness, inappropriateness of educational material in testing packs, cultural reasons, beliefs about bowel cancer, a higher risk of not having a fixed address, and under-identification of Aboriginal or Torres Strait Islander origin when returning forms. Culturally appropriate and localised health promotion campaigns and information, recommendations for testing by a person's health service, alternative methods of distributing test kits, and specific strategies to promote screening through Aboriginal and Torres Strait Islander health services may increase participation in screening.[91–93]

Estimating risk based on family history

Age is the biggest risk factor for developing colorectal cancer. The 2017 National Health and Medical Research Council (NHMRC)-endorsed *Clinical practice guidelines for the prevention, early detection and management of colorectal cancer*[94] are used to determine an asymptomatic person's risk of colorectal cancer based on family history. Box 1 highlights the risk factors for each risk category. Refer also to 'Resources'.

Interventions

Screening: It takes approximately 10 years for benign colorectal adenomas to progress to cancer. Screening for colorectal cancer allows cancers to be detected at an earlier stage when treatment is more effective, and allows some cancers to be prevented through removal of benign adenomas. The survival rate is higher for people with colorectal cancer detected through screening.[95]

Immunochemical faecal occult blood test (iFOBT) screening: Evidence shows that two-yearly screening of asymptomatic average risk people aged 50–75 years using an iFOBT reduces the risk of dying from colorectal cancer. For iFOBT screening, it is estimated that for every 1000 people screened regularly, approximately 20 deaths from colorectal cancer will be prevented, with 10 people having gastrointestinal or cardiovascular complications due to follow-up colonoscopy. Some evidence suggests that screening could be considered for those aged 76–85 years, but that the appropriateness of this depends on patient circumstances. Evidence is lacking for benefit of screening for those aged >85 years.[96–99]

The National Bowel Cancer Screening Program is being expanded and by 2020 every person eligible for Medicare and aged 50–74 years will be invited to participate in bowel cancer screening using an iFOBT kit sent through the mail.[100] For people aged >50 years not eligible for the National Bowel Cancer screening program, iFOBT kits may be bought through Cancer Council state organisations, and some GPs, pathology centres and pharmacies. GPs can also refer patients for iFOBT tests to pathology labs that can use Medicare Benefits Schedule (MBS) pathology items for patients eligible to claim Medicare benefits.[101]

Other screening methods: Computed tomography (CT) colonography, flexible sigmoidoscopy and colonoscopy may be appropriate screening methods for some people. Colonoscopy is not recommended as first-line screening for those near average risk due to the increased risk of harm compared to iFOBT screening, but may be appropriate for people with a moderate or high risk.[94,97–99]

Aspirin: There is increasing evidence of the overall benefit of taking aspirin for prevention of adenomas and colorectal cancers.[94,102–105] For people with previous adenomas who are at higher risk of colorectal cancer, or for those at high risk due to familial cancer syndromes, in particular Lynch syndrome, benefits of reduction in recurrent adenoma and colorectal cancer may outweigh the risks of harm.[94,106,107] For people aged 50–69 years at moderate to high risk of cardiovascular disease (CVD), there is some evidence that low-dose aspirin for at least 2.5 years may decrease the risk of CVD and after 10 years reduce the risk of bowel cancer, and that aspirin could be considered in those at lower risk of bleeding with at least 10 years' life expectancy, with much greater benefit versus harms for those aged 50–59 years compared to 60–69 years. Approximately 9–14 cases of colorectal cancer may be prevented (depending on age and CVD risk) for 1000 men aged 50–69 years taking low-dose aspirin for several years.[94,105] Aspirin is not currently recommended in Australian guidelines for the prevention of CVD (refer to Chapter 11: Cardiovascular disease prevention). For people at moderate or high risk of colorectal cancer without a familial syndrome, the benefits generally outweigh the risk for those without risk factors for bleeding.[94] It is unknown whether the same risk–benefit ratios would apply to Aboriginal people in Australia in the same age ranges, and consideration should be given regarding access to services should bleeding complications arise. Refer to 'Resources' for updated Australian clinical guidelines for colorectal cancer[94] and more details on recommendations for prophylactic aspirin to prevent colorectal cancer.

Recommendations: Prevention and early detection of colorectal (bowel) cancer

Preventive intervention type	Who is at risk?*	What should be done?	How often?	Level/ strength of evidence	References
Screening	All adults	Ask about family history of colorectal cancer (Box 1) in order to estimate the individual risk of developing colorectal cancer	As part of an annual health assessment	GPP	94
	Category 1: People near average risk age 50–74 years (Box 1)	Promote client participation in the National Bowel Cancer Screening Program using the immunochemical faecal occult blood test (iFOBT) kit that is received through the mail for eligible ages iFOBT tests can be sourced through pathology centres or purchased through other organisations for those people who wish to do two-yearly bowel screening prior to full implementation of the screening program in 2020, or for those aged 45–49 years who have one family member with colorectal cancer Refer all abnormal results for appropriate diagnostic evaluation, usually with a local colonoscopy provider	iFOBT screening every two years in age range 50–74 years For people in this category with one relative with colorectal cancer, consider starting screening from age 45 years	IA PP	94, 97–99, 108
	People near average risk aged 75–85 years	If requested, discuss the risks and benefits of screening using iFOBT, as any benefit is likely to be small due to higher risks of complications and lower benefits if previously screened. These discussions should take into account individual circumstances such as overall health and comorbidities If positive iFOBT test, refer for appropriate diagnostic evaluation, usually with colonoscopy	Population screening not recommended. If asked, consider iFOBT every two years depending on individual circumstances and patient choice	IC	94, 97, 98

Recommendations: Prevention and early detection of colorectal (bowel) cancer					
Preventive intervention type	**Who is at risk?***	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	Category 2: People at moderate risk (Box 1)	Recommend iFOBT then colonoscopy screening, starting from age 40 years (Computed tomography [CT] colonography may be considered if colonoscopy is contraindicated)	iFOBT screening every two years in age range 40–50 years Colonoscopy should be performed every five years from ages 50 to 74 years	III–IIC	94, 108
	Category 3: Those at potentially high risk (Box 1)	Start iFOBT then colonoscopy screening from age 35 years (CT colonography may be offered if colonoscopy is contraindicated) Consider referral to a genetic centre for hereditary cancer syndromes, especially for those with three people with colorectal cancer on the same side of the family (Refer to 'Resources' for specific recommendations for screening for those with familial cancer syndromes – these groups require much earlier screening, some from adolescent years)	iFOBT screening every two years in age range 35–45 years Colonoscopy should be performed every five years in age range 45–74 years Consider referral at the time of determining the individual is at high risk, or later if not done initially	III–IIC	94, 108
	Past history of adenoma	Undertake surveillance colonoscopy	Time frame for surveillance colonoscopy varies depending on risk (refer to 'Resources')	I, III–IIA	109, 110
	History of inflammatory bowel disease (ulcerative colitis or Crohn's disease)	Undertake surveillance colonoscopy	Time frame for surveillance colonoscopy varies depending on risk (refer to 'Resources')	II, III–IIB	109, 110
Behavioural	All people	Provide lifestyle risk factor counselling on the benefits of regular physical activity, maintaining healthy weight, alcohol intake in the low-risk range, restricting energy intake and dietary fat (refer to Chapter 1: Lifestyle) Also recommend the consumption of vegetables and sources of dietary fibre as these foods may be protective. Recommend consuming only moderate amounts of red meat, minimising the consumption of charred and processed meats	As part of an annual health assessment	III–IIC	82, 94
Chemo-prophylaxis	Following complete removal of adenoma at colonoscopy, or non-syndromic familial cancer patients	Assess bleeding risk and, if no contraindications, consider low-dose (100 mg) daily aspirin (in consultation with a specialist) Benefit may be increased when concurrent elevated cardiovascular disease (CVD) risk is present (refer to Chapter 11: Cardiovascular disease prevention)	At time of diagnosis	IIB	94, 106, 107

Recommendations: Prevention and early detection of colorectal (bowel) cancer					
Preventive intervention type	**Who is at risk?***	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Chemo-prophylaxis	For those at high risk due to Lynch syndrome	Unless contraindicated, recommend daily aspirin (evidence that low-dose 100 mg/day is as effective as high dose)	At time of diagnosis, specialist consultation. Usually from age 25 years for those with Lynch syndrome carrier status	I, IIA	94, 102, 111, 112
	For people aged 50–69 years at average risk of colorectal cancer	Discuss evidence that low-dose aspirin (100–300 mg per day) commencing at age 50–70 years for at least 2.5 years reduces the risk of colorectal cancer 10 years after commencement, and reduces the risk of cardiovascular events in a shorter time frame (refer to Chapter 11: Cardiovascular disease prevention). Combined reduction of colorectal cancer and cardiovascular risks outweighs the risk from bleeding complications. Benefit for cancer prevention may be longer lasting with longer duration of use Consider 10-year life expectancy and CVD risk, and avoid in those with high risk of bleeding, renal impairment and uncontrolled hypertension Less evidence for colorectal cancer prevention for women aged >65 years, but women this age with CVD risk factors are likely to also benefit Refer to 'Resources' for further information	Consider discussing from age 50 years, taking into account individual preferences and risk–benefit profile, including access to services if complications Consider breath testing for *Helicobacter pylori* and treatment if positive before commencing aspirin	IB PP	94, 105 94
	For people at moderate (Category 2) or high risk (Category 3) without a familial syndrome	Consider 100 mg aspirin daily in those without high risk of bleeding, renal impairment or uncontrolled hypertension Consider *H. pylori* testing, and treatment if positive, before commencing aspirin	Discuss risks and benefits as in above	PP	94
*Refer to Box 1 for risk categories.					

Box 1. Risk categories for colorectal cancer based on family history[94]

Category 1	Category 2	Category 3
Those at near average risk based on family history (95–98% of population; risk slightly below to up to two times average risk, 10% lifetime risk)	**Those at moderately increased risk based on family history (2–5% of population; risk three-fold to six-fold average risk, 15–30% lifetime risk)**	**Those at potentially high risk based on family history (<1% of population; risk seven-fold to ten-fold average risk, 30–40% lifetime risk)**
No first-degree or second-degree relative with colorectal cancer One first-degree relative with colorectal cancer diagnosed at age ≥55 years One first-degree and one second-degree relative with colorectal cancer diagnosed at age ≥55 years	One first-degree relative with colorectal cancer diagnosed at age <55 years Two first-degree relatives with colorectal cancer diagnosed at age ≥55 years One first-degree relative and at least two second-degree relatives with colorectal cancer diagnosed at age ≥55 years	At least three first-degree or second-degree relatives with colorectal cancer, with at least one diagnosed at age <55 years At least three first-degree relatives with colorectal cancer diagnosed at age ≥55 years

Resources

- Cancer Council Australia, *Clinical practice guidelines for the prevention, early detection and management of colorectal* cancer, https://wiki.cancer.org.au/australia/Guidelines:Colorectal_cancer
- Cancer Council Australia, *Clinical practice guidelines for the prevention, early detection and management of colorectal cancer*, information on familial risk of colorectal cancer:
  - 'Introduction: risk and screening based on family history of colorectal cancer', https://wiki.cancer.org.au/australia/Guidelines:Colorectal_cancer/Risk_and_screening_based_on_family_history
  - 'Colorectal cancer risk according to family history', https://wiki.cancer.org.au/australia/Clinical_question:Family_history_and_CRC_risk
  - 'Screening strategies for people with a family history of colorectal cancer', https://wiki.cancer.org.au/australia/Guidelines:Colorectal_cancer/Screening_based_on_family_history
- Cancer Council Australia, *Clinical practice guidelines for surveillance colonoscopy* – surveillance following removal of adenomas, following surgery for colorectal cancer or for those with inflammatory bowel disease, http://wiki.cancer.org.au/australia/Guidelines:Colorectal_cancer/Colonoscopy_surveillance

Early detection of prostate cancer

Background

Prostate cancer is the fourth most common cancer diagnosed in Aboriginal and Torres Strait islander peoples. The age-standardised incidence of prostate cancer in Aboriginal and Torrres Strait Islander men was estimated to be 30% less than for non-Indigenous men, with no difference in mortality rate. Missing data on Aboriginal and Torres Strait Islander status was estimated in around 15% of prostate cancers.[3]

Factors that may indicate an increased risk of prostate cancer are multiple blood relatives having prostate cancer, especially if they are first-degree relatives (father, brother, son); if cancer was diagnosed earlier than 55 years in the family member; and if, in addition to prostate cancer, there is a family history of other cancers. There are specific gene mutations that are known to increase the risk, such as being a carrier of BRAC1 or BRCA2 mutations.[113–116]

Interventions

Individual discussion if requested about prostate cancer risk

Measuring prostate-specific antigen (PSA) with or without digital rectal examination (DRE) is not recommended for asymptomatic population screening for prostate cancer due to the risk of false positive results, risk of harm from investigations, risk of overdiagnosis and unnecessary treatment of a slow-growing cancer that may have had no impact on quality or length of life. Men who are concerned about their risk of prostate cancer should discuss this with their doctor. Doctors should help such men to make a fully informed decision whether or not to commence regular PSA screening – DRE screening is no longer recommended. Use of a decision support tool, such as The Royal Australian College of General Practitioners' tool for men aged 50–69 years (refer to 'Resources'),[124] may be helpful.[117]

Men with urinary symptoms should consult their doctor for appropriate investigation and management.

Recommendations: Early detection of prostate cancer					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	Asymptomatic men at average risk	Population-based screening is not recommended. If patients request information, discussion needs to provide information of risks and benefits of prostate-specific antigen (PSA) testing to allow an informed decision Consider using a decision aid tool to facilitate these discussions (refer to 'Resources')	Population screening not recommended. For male patients aged 50–69 years who request information and screening, consider PSA testing every two years after obtaining informed consent	I, III–IID	5, 113, 114, 118–123
	Asymptomatic men at potentially higher risk due to family history	Recommend individualised discussion with patient based on assessment of risks and benefits If requested, following these discussions, consider PSA testing from age 40 or 45 years, depending on risk of patient (refer to clinical practice guidelines in 'Resources' for risk estimates and recommendations)		GPP	123

Resources

- National Health and Medical Research Council (NHMRC), 'PSA testing for prostate cancer in asymptomatic men: Information for health practitioners', www.nhmrc.gov.au/_files_nhmrc/publications/attachments/men4d_psa_testing_asymptomatic_men_140304.pdf
- Prostate Cancer Foundation of Australia, and Cancer Council Australia PSA Testing Guidelines Expert Advisory Panel, *Clinical practice guidelines: PSA testing and early management of test-detected prostate cancer*, 'PSA testing strategies', http://wiki.cancer.org.au/australia/Guidelines:PSA_Testing/PSA_Testing_strategies
- The Royal Australian College of General Practitioners (RACGP), 'Should I have prostate cancer screening?' – information sheet to guide discussions on prostate cancer testing, www.racgp.org.au/download/Documents/Guidelines/prostate-cancer-screening-infosheetpdf.pdf

Prevention of lung cancer

Background

Lung cancer is the most common cancer diagnosed in Aboriginal and Torres Strait Islander peoples, with an incidence rate two times that of non-Indigenous people, and a mortality rate that is 1.8 times higher. This is highly correlated with higher rates of smoking in Aboriginal and Torres Strait Islander populations compared to non-Indigenous populations.[3]

Interventions

Smoking cessation: Tobacco smoking is the major contributor to lung cancer. Smoking cessation and reducing exposure to second-hand smoke decreases the risk of developing lung cancer (refer to Chapter 1: Lifestyle, 'Smoking').

Neither low-dose CT scanning nor chest X-ray are currently recommended for population-based screening for lung cancer in Australia.[125–127] One large randomised controlled trial from overseas found that screening

people at high risk of lung cancer (people aged 55–74 years with a 30-year pack history of smoking and either currently smoking or ceased within the last 15 years) with low-dose CT reduces lung cancer mortality and, to a lesser degree, all-cause mortality.[128] A meta-analysis of nine trials (including this trial), however, found a non-significant trend to reduced lung cancer mortality.[128] However, there were methodological weaknesses in several of the trials included in these analyses, and further studies are underway.[129] While low-dose CT scanning has been recommended by the US Preventive Services Task Force, the cost-effectiveness of implementing this screening strategy has not been assessed.[130,131] The applicability of low-dose CT population-based screening for lung cancer in Australia is unknown at this stage and is not recommended at present in Australian guidelines due to the uncertainty of the target population, the health benefit versus harms, and the cost-effectiveness of this screening in the Australian population.[127]

Recommendations: Prevention of lung cancer

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	Asymptomatic adults, including people who smoke or who are ex-smokers	Population-based screening of either high-risk or low-risk people with either chest X-ray or low-dose computed tomography (CT) is not recommended at this time. Further evidence from screening studies in high-risk individuals may change this recommendation in the future		IID	125–127
Behavioural		Provide lifestyle risk factor counselling on the benefits of avoiding smoking and exposure to second-hand smoke (refer to Chapter 1: Lifestyle, 'Smoking')	At least during annual health assessment; refer to Chapter 1: Lifestyle, 'Smoking'	III–IIB	

Resources

- Cancer Council Australia, *Clinical practice guidelines for the prevention and diagnosis of lung cancer*, http://wiki.cancer.org.au/australia/Guidelines:Lung_cancer/Prevention_and_diagnosis

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Chapter 16: Family abuse and violence

Background

The term 'family abuse and violence' (FAV) is used in this chapter to encompass domestic violence, intimate partner violence or abuse, the effects on children and perpetrator issues. Abuse and violence may involve physical, psychological, financial harms, social isolation, sexual abuse and violence, stalking, and use of digital technologies to inflict harm.[1] FAV is an important issue for the whole of Australian society; however, it is of particular concern to Aboriginal and Torres Strait Islander communities. Aboriginal and Torres Strait Islander women are 34 times more likely to be hospitalised due to family violence than non-Indigenous women, and FAV is the greatest driver of Aboriginal and Torres Strait Islander children being in out-of-home care.[2] The prevalence of violence against Aboriginal and Torres Strait Islander women is difficult to establish for many reasons. Despite under-reporting, surveys show Aboriginal and Torres Strait Islander women report higher levels of violence and suffer higher levels of injury and death as a result of family violence than non-Indigenous women.[3] It is also important to recognise that the perpetrator may be non-Indigenous. The FAV prevalence rates are similar across all Aboriginal and Torres Strait Islander communities, with little variation by degree of remoteness.[4,5] Victims of FAV are unlikely to express their experience using explicit terms such as 'family abuse and violence'. Cripps reports[6,7] that Aboriginal and Torres Strait Islander victims are more likely to use 'phases such as "um (pause) well we were arguing", "my husband was acting up", "he was being cheeky", "it was just a little fight" and "we were drinking"'. Such terms are also used by perpetrators and community members, and may have a normalising effect, which leads to underestimating the extent of the problem.

Identifying family abuse and violence

Early identification of, and support for, individuals and families experiencing family abuse and violence is critical. Early intervention is a priority when there is a suspicion of violence escalating, and to prevent the recurrence and reduction of longer term harm.[8] A healthcare provider is likely to be the first professional contact for survivors of intimate partner abuse or sexual assault,[9] and consequently it is important that the health professional community is equipped with the necessary knowledge, skills and resources to intervene appropriately.

Women experiencing FAV may not seek help until their situation reaches crisis point; they may never seek help; they may leave and return to a violent partner multiple times; or they may not recognise or acknowledge that their experience is FAV.[8] Victims may also present to healthcare providers with symptoms of depression, anxiety, insomnia, post-traumatic stress disorder, non-specific symptoms, pain, suicidal ideation, alcohol and other drug issues, and with other presenting complaints that appear to be unrelated. Health providers, therefore, need to be comfortable with asking if these symptoms may be related to FAV and to assess safety concerns for the victim and children.[10] There is evidence that Aboriginal and Torres Strait Islander people are less likely to disclose FAV than non-Indigenous Australians, with one study finding that around 90% of violence against Aboriginal and Torres Strait Islander women was not disclosed.[10] This highlights the need to talk about confidentiality and to ask about the possibility of abuse in a sensitive and empathic manner that takes account of the needs of children living in these families.[5] Mandatory reporting may be required, depending on the type of abuse and legislative requirements in accordance with state and territory requirements.

It is also critical to be aware that perpetrators may also be presenting to care providers for other medical care, and there may be opportunities to discuss what is happening in the family and provide appropriate support for both perpetrators and victims. More information can be found in the RACGP *Abuse and violence: Working with our patients in general practice* (White Book) chapters specific to Aboriginal and Torres Strait Islander communities (Chapter 11) and to perpetrators (Chapter 5) (refer to 'Resources').[11] Aboriginal medical services and general practices are encouraged to discuss how to address these issues and to work out ways of making sure that the victim and perpetrator are being seen by different health practitioners. This is important for confidentiality and acknowledges that it is not possible for one person to safely care for both parties.

Interventions

Primary healthcare has an important role to play in dealing with FAV, particularly where early identification can trigger interventions that work by asking women about FAV and working with them around safety and management. This will involve primary healthcare providers accepting that they have a role, understanding the way patients may speak about what is happening,[7] asking and working with safety, and being able to refer and coordinate care with other community services when appropriate.[5] This may take time and is more like treating a chronic illness than a one-off intervention. Children can experience major harm from FAV, which can affect their development and can be a major contributor to future social and health issues[12] (refer to Chapter 3: Child health, 'Preventing child maltreatment').

There is limited high-quality evidence on the effectiveness of mainstream and Aboriginal and Torres Strait Islander–specific FAV prevention programs. Despite this, expert consensus has identified the following principles as being important for successful implementation of FAV interventions in Aboriginal and Torres Strait Islander communities:[13]

- community involvement, engagement and a strong acceptance; it is important to recognise that establishing meaningful community engagement can be a lengthy process
- consideration of cultural factors
- service delivery and program integration
- planning for long-term sustainability
- holistic focus and flexible approach.

Barriers to effective programs include:

- lack of integrated and coordinated service delivery practices
- expecting unrealistically large and rapid improvements
- over-simplistic policy frameworks to address entrenched issues
- operating with a lack of cultural awareness
- unsustainable responses that rely solely on short-term government funding.

If healthcare providers were to routinely ask all women about domestic violence (screening), this might encourage women who were reluctant to disclose their abuse to do so, or to recognise their own situation as abusive. A 2015 Cochrane review concluded that while screening led to an increase in the identification of intimate partner violence, there was no clear indication this increased referrals or women's engagement with support services, or decreased such violence.[14]

However, the US Preventive Services Task Force recommended in 2013 that screening for intimate partner violence should occur for **adult women** who do not have signs or symptoms of abuse, and that women found to screen positive should be referred to intervention services. They found that the risk of harm from screening was small. They defined that all women were at potential risk for abuse but women of young age, with a history of substance abuse, marital difficulties and economic hardship, were at higher risk. An appropriate interval for screening was not able to be recommended. Several valid screening tools, with high levels of sensitivity and specificity, are available when screening for intimate partner violence. These include the Hurt, Insult, Threaten, Scream (HITS) tool, which asks four questions to ascertain if the partner is causing physical hurt, being insulting, threatening, or screaming/cursing at the victim, and scores responses according to a Likert scale.[15]

Kaiser Permanente (an integrated healthcare organisation in California with nearly four million patients) has demonstrated that making intimate partner violence assessments a 'part of everyday care' (through eHealth record prompts) has the potential to make a difference. Visible posters in clinics, routine enquiry and brief intervention are used. All patients that screen positive are referred to community services, many of which are onsite, and are provided with behavioural supports including safety planning, mental health supports and

follow-up. Partnerships with local community organisations ensure referral systems for crises support, emergency shelter and legal assistance as well as women's groups for support.[16] The integrated attention needed to respond to family abuse and violence identified in primary healthcare settings may explain why studies in other US settings suggest limited improvements in the identification of partner violence, interventions and referrals from screening.[16]

Case finding, on the other hand, refers to actively asking women about FAV **if they show signs of abuse or are in high-risk groups**,[14] or when they present with symptoms such as depression, anxiety, headaches, drug and alcohol abuse and many other issues with which FAV is associated. Rather than screening all women, it may be more effective to identify these women through a routine social history and then provide them with supportive safety planning, follow-up and referral when the person is ready.[14]

In view of the lack of good evidence that screening all women will produce better outcomes, case finding is the current recommendation.[12]

There is a stronger case for routine screening of pregnant women in Australia as FAV prevalence rates are higher during pregnancy.[12]

In working to prevent FAV, family visits and programs for adolescents on healthy relationships are showing promise.[17,18] There is good evidence that early identification and intervention can help make victims and children much safer.[9] There is also recognition that more intensive support needs to be provided to perpetrators, and several programs are now emerging to assist with this.[19,20] Health professionals need to be aware that the strongest risk factors for being a victim of physical violence are alcohol and other drug use by the perpetrator.[21] Other risk factors are being in lone-parent families and experiencing financial stress.

FAV affects whole communities, hence the community and support services need to work together to find solutions. Programs that involve working with the whole community are essential, and several promising programs are emerging that take a community-based approach to FAV,[13] such as spiritual interventions and working with communities to help individuals to heal from past abuse and violence.[22,23]

Working with victims and perpetrators of FAV can place additional stress on primary healthcare providers, and it is important that health services have systems and protocols in place to ensure staff safety and support.[24,12]

Recommendations: Family abuse and violence

Prevention intervention type	Target group	What should be done?	How often?	Level/ strength of evidence	References
Screening	Victims of family abuse and violence (FAV)* Perpetrators of FAV	Establish a high level of awareness of the risks of FAV and actively case find† by taking a social history and asking sensitively about the potential for FAV	Opportunistic and as part of an annual health assessment	IIIA	9
	Pregnant women	Assess for the risk of FAV as part of a comprehensive antenatal assessment (refer to Chapter 2: Antenatal care)	At least once in every pregnancy	GPP	25
Behavioural	Victims of FAV, and women and children at risk of FAV (high-risk groups include women of young age, with history of substance abuse, marital difficulties and economic hardship)	Assess for social and emotional wellbeing (refer to Chapter 17: Mental health) Refer to local social support services (refer to 'Resources')	Opportunistic	GPP	17
	Pregnant women who are at high risk of, or are victims of, FAV	Promote regular health professional contact via nurse, Aboriginal health worker or practitioner-initiated home visits	Assess regularly in antenatal period and continue until child is aged two years (using specially trained staff and addressing safety issues)	GPP	17

Recommendations: Family abuse and violence					
Prevention intervention type	**Target group**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Behavioural	Perpetrators of FAV	Engage perpetrators in men's behaviour change programs (refer to 'Resources')	Opportunistic	GPP	19, 20
	Victims and perpetrators of FAV where there is high household use of alcohol and other drugs	Assess for alcohol and other drug-related harm and work to limit use (refer to Chapter 1: Lifestyle, 'Alcohol'; and Chapter 4: The health of young people)	Opportunistic and as part of an annual health assessment	GPP	21, 26–28
	Healthcare providers	Implement service-level systems and protocols to train and support staff in identifying and responding to FAV‡ Offer support services to staff experiencing stress from working with victims/perpetrators of FAV	Opportunistic and annually as part of staff professional development activities	GPP	24, 12
Environmental	Children of high school age and adolescents	Encourage the implementation of school-based programs to promote development of healthy personal relationships	As part of school curriculum	GPP	18, 23
	Community	Create referral pathways for crises support, women's support groups, emergency shelter and legal assistance by establishing partnerships with local community organisations Support community and government initiatives to reduce alcohol-related harm (eg price, access restrictions; refer to Chapter 1: Lifestyle, 'Alcohol')		GPP	12, 13, 22, 23, 27

*The term 'family abuse and violence' (FAV) encompasses domestic violence, intimate partner violence or abuse, the effects on children and perpetrator issues. Abuse and violence may involve physical, psychological, financial harms, social isolation, sexual abuse and violence, stalking, and use of digital technologies to inflict harm.

†Case finding refers to actively asking women about FAV if they show signs of abuse or are in high-risk groups,[14] or when they present with symptoms such as depression, anxiety, headaches, drug and alcohol and many other issues that FAV is associated with.

‡Make FAV assessments a 'part of everyday care' through eHealth record prompts, posters in clinics, routine enquiry through social history, and provide brief intervention. Streamline referral pathways to community services, and provide onsite behavioural supports, including safety planning, mental health supports and follow-up.

Resources

- 1800RESPECT (1800 737 732), 24-hour, national sexual assault, domestic family violence counselling service – information and support to Aboriginal health workers and general practitioners, as well as telephone counselling service for patients and their families, www.1800respect.org.au
- *Australian Family Physician* (*AFP*), relevant articles:
  - 'Family violence across the life cycle', www.racgp.org.au/afp/2014/november/family-violence-across-the-life-cycle
  - 'Identifying and responding to men who use violence in their intimate relationships', www.racgp.org.au/afp/2016/april/identifying-and-responding-to-men-who-use-violence-in-their-intimate-relationships
  - 'Intimate partner violence', www.racgp.org.au/afp/2011/november/intimate-partner-violence

- Australian Institute of Health and Welfare, Australian Institute of Family Studies, *Family violence prevention programs in Indigenous communities*, Closing the Gap Clearinghouse resource sheet no. 37, www.aihw.gov.au/getmedia/c0e5bdde-e9c4-4a1f-808e-256191835cde/ctgc-rs37.pdf.aspx?inline=true
- National Family Violence Prevention Legal Services, www.nationalfvpls.org/images/files/Membership_Details_National_FVPLS_Forum-_JULY_2014.pdf
- The Royal Australian College of General Practitioners (RACGP) resources:
  - *Abuse and violence: Working with our patients in general practice* (White Book), www.racgp.org.au/whitebook
  - White Book, Chapter 5: Dealing with perpetrators in clinical practice, www.racgp.org.au/your-practice/guidelines/whitebook/chapter-5-dealing-with-perpetrators-in-clinical-practice
  - Professional Development Program on Family Violence, www.racgp.org.au/familyviolence (login required)
  - Webinar: Working with men who use violence in their relationships, www.racgp.org.au/education/courses/faculty-webinars/national/men-who-use-violence

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Chapter 17: Mental health

Prevention of depression

Background

The National Mental Health Plan 2003–08 noted that mental health is an area where 'diverse views exist and ... terms are used in different ways'.[1] The term 'social and emotional wellbeing' is often inaccurately considered synonymous with 'mental health'. Social and emotional wellbeing implies a holistic, strengths-based approach, and is distinguished from a disease-oriented medical model (Box 1).

Box 1. Concepts of social and emotional wellbeing[2]

'In broad terms, social and emotional wellbeing is the foundation for physical and mental health for Aboriginal and Torres Strait Islander peoples. It is a holistic concept which results from a network of relationships between individuals, family, kin and community. It also recognises the importance of connection to land, culture, spirituality and ancestry, and how these interact and affect the individual.

Social and emotional wellbeing may change across the life course: what is important to a child's social and emotional wellbeing may be quite different to what is important to an Elder. However, across the life course a positive sense of social and emotional wellbeing is essential for Aboriginal and Torres Strait Islander people to lead successful and fulfilling lives.'

Social and emotional wellbeing is a key component of the Aboriginal definition of health. It includes concepts of connection to country, kin and community and is applicable across the whole lifecycle.[3] However, much of the research in this area is performed in settings outside Aboriginal and Torres Strait Islander communities, without Indigenous ownership, and is grounded within a more Western, individualistic, medical model of health. As such, inclusion criteria and outcomes are determined by Western-centric diagnostic categories, such as those in the *Diagnostic and statistical manual of mental disorders*, 5th edition (DSM-5),[4] and do not incorporate Indigenous perspectives. In looking at evidence to make recommendations for the prevention of depression and suicide, this chapter recognises there can be tensions between biomedical-oriented and Indigenous-oriented concepts of mental health.

There is increasing evidence that symptoms associated with depression are differently expressed across various cultures[5] and by gender.[6] Clinicians need to be aware of local cultural and contextual issues in which symptoms suggestive of depression might be expressed. There is a need for Indigenous-led and community-owned studies to be conducted within the Australian context to work towards increasing awareness around the varying expressions of depressive and suicidal behaviours.

Depression is recognised to be a major health and wellbeing issue in Aboriginal and Torres Strait Islander communities. The National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) of 2012–13 showed that 30% of Aboriginal and Torres Strait Islander adults reported high to very high levels of psychological distress. This was 2.7 times the age-adjusted rate for non-Indigenous people. High levels of psychological distress were associated with being unemployed and with education to year 9, compared with reaching year 12.[7]

The NATSIHS also found high rates of self-reported stress for Aboriginal and Torres Strait Islander adults (aged >18 years), with at least one stressor being reported by Aboriginal and Torres Strait Islander peoples 1.4 times as often as by the non-Indigenous population (Table 1).[1] These stressors are interrelated and often linked to the social determinants of health and wellbeing, such as poverty, unemployment, exposure to racism and exclusion from economic and community resources.

The proportion of Aboriginal and Torres Strait Islander people self-reporting psychosocial stress also differs by remoteness. A significantly higher proportion of people reported experiencing one or more stressors (in the previous year), such as the inability to get a job, mental illness, or other serious illness, in non-remote compared with remote areas. However, a higher proportion in remote (than in non-remote) areas cited the death of a family member and overcrowding at home as family stressors.[8]

The rates of hospitalisation for mental and behavioural disorders are approximately three times as high for Aboriginal and Torres Strait Islander peoples compared to non-Indigenous people.[9]

The NATSIHS also found high rates of self-reported stress for Aboriginal and Torres Strait Islander adults (aged >18 years) compared to the general population (Table 1).[1] These stressors are interrelated, often linked to broader life experiences, and contribute to comorbidity associated with other medical conditions.

The high prevalence of these stressors in adults also has effects on children. The West Australian Aboriginal Child Health Survey found that 70% of children were living in families that had experienced three or more significant life events in the previous 12 months.[10]

Table 1. Proportion of Aboriginal and Torres Strait Islander people around Australia self-reporting psychological distress and significant life events[7,8]

Type of stressor	Proportion of Aboriginal/Torres Strait Islander people reporting this stressor in previous year
Death of a family member or friend	37%
Serious illness or disability	23%
Not able to get a job	23%
Alcohol-related problems	14%
Drug-related problems	11%
The person/family member/close friend spent time in jail	10%
Witness to violence	8%
Trouble with police	13%
Treated badly because they are an Aboriginal and/or Torres Strait Islander person	7%
Any stressor	73%

Adapted from Australian Bureau of Statistics. Australian Aboriginal and Torres Strait Islander Health Survey: First results, Australia, 2012–13. Canberra: ABS, 2013.

Conversely, cultural and social factors can have a profound protective effect on Aboriginal and Torres Strait Islander peoples' social and emotional wellbeing. Continuing connection to country and culture are, for example, protective, as are increasing income, increased level of education and participation in the labour force.[11]

Instruments used to assess social and emotional wellbeing

A number of instruments can be used to assess the psychological distress affecting Aboriginal and Torres Strait Islander peoples. Most have been used to assess non-Indigenous populations, and may not adequately cover Indigenous concepts of social and emotional wellbeing.[12] This lack of validation of these tools for use with Aboriginal and Torres Strait Islander Australians means their widespread use is not recommended. To quote the Australian Psychological Association, 'Particular caution should be exercised where tests have not been extensively tried with Indigenous people and where test norms for those Indigenous populations are non-existent'.[13] Moreover, Aboriginal and Torres Strait Islander communities are very diverse, and use of any instrument will require clinical discretion to account for this diversity.

One of the most widely used tools in Australia for monitoring and assessing psychological distress is the Kessler Psychological Distress Scale (K-10). This tool has not been validated as a screening tool for depression. Moreover, there are concerns from Aboriginal and Torres Strait Islander people that the K-10 is not culturally appropriate for use within their communities. For this reason, the K-10 was adapted in an Australian Bureau of Statistics stakeholder workshop, which included representatives from the National Aboriginal Community Controlled Health Organisation (NACCHO), to make it more appropriate for use in Aboriginal and Torres Strait Islander communities. The resulting questionnaire has five questions, and is known as the K-5. The K-5 questions are shown in Box 2.

Box 2. K-5 questionnaire to measure psychological distress[14]

Instructions
The following five questions ask about how you have been feeling in the last four weeks. For each question, mark the circle under the option that best describes the amount of time you felt that way.

	None of the time	A little of the time	Some of the time	Most of the time	All of the time
1. In the last four weeks, about how often did you feel nervous?	1	2	3	4	5
2. In the last four weeks, about how often did you feel without hope?	1	2	3	4	5
3. In the last four weeks, about how often did you feel restless or jumpy?	1	2	3	4	5
4. In the last four weeks, about how often did you feel everything was an effort?	1	2	3	4	5
5. In the last four weeks, about how often did you feel so sad that nothing could cheer you up?	1	2	3	4	5

The total score is obtained by adding the score for each item. Minimum score = 5; maximum score = 25.
Psychological distress can be classified as: low: 5–7; moderate: 8–11; high: 12–14; very high: 15–25.

Other non-Indigenous questionnaires have been adapted for use with Aboriginal and Torres Strait Islander peoples. One example is the Pearlin Mastery Scale,[15] adapted for use in Arnhem Land with extensive involvement of the Yolgnu community.

Brown and colleagues adapted the Patient Health Questionnaire 9 (PHQ-9),[16] involving the expertise of focus groups of men from primary language groups in central Australia. Given that the PHQ-9 is one of the most validated tools for screening for depression, this adaptation may prove to be very useful once it has been further validated. The adapted PHQ-9 questions are contained in Box 3.

Box 3. PHQ-9 questions, adapted for potential screening of Aboriginal men in central Australia for depression

Questions		None	A little bit	Most of the time	All of the time
In the last two weeks, how often have you been feeling the following:					
1	Have you been feeling slack, not wanted to do anything?	0	1	2	3
2	Have you been feeling unhappy, depressed, really no good, that your spirit was sad?	0	1	2	3
3	Have you found it hard to sleep at night, or had other problems with sleeping?	0	1	2	3
4	Have you felt tired or weak, that you have no energy?	0	1	2	3
5a[$]	Have you not felt like eating much even when there was food around?	0	1	2	3
5b[$]	Have you been eating too much food?	0	1	2	3
6	Have you been feeling bad about yourself, that you are useless, no good, that you have let your family down?	0	1	2	3
7	Have you felt like you can't think straight or clearly, it's hard to learn new things or concentrate?	0	1	2	3
8a[$]	Have you been talking slowly or moving around really slow?	0	1	2	3
8b[$]	Have you felt that you can't sit still; you keep moving around too much?	0	1	2	3
9	Have you been thinking about hurting yourself or killing yourself?	0	1	2	3
					Total score (0–27)

[$]Note: Scores for depressive symptoms – record only the highest in each of these sub-questions.

Scoring (from the non-adapted PHQ-9):

<5 = minimal; 5–9 = mild; 10–14 = moderate; 15–19 = moderately severe; 20–27 = severe.

An adaptation of the PHQ-9 has been tested in Aboriginal and Torres Strait Islander people who have ischaemic heart disease attending an Aboriginal Medical Service in Darwin.[17] The adaptation of the PHQ-9 achieved 71% specificity and 80% sensitivity, which is lower than the PHQ-9 in other populations. A subset of just two questions was also tested in this study:[17]

> *Over the last 2 weeks how often have you been bothered by any of the following problems? Never/A little/A lot/All the time*
>
> 1. *Not enjoying things like you used to.*
> 2. *Feeling down, depressed or hopeless.*

In this study, a 'Yes' answer to either question was 100% sensitive and 12.5% specific for depression. This means that a negative result rules out depression but there are many false positives. It is not clear how applicable this result is to other Aboriginal and Torres Strait Islander communities or peoples without ischaemic heart disease. The cultural appropriateness of these questions has not been assessed more broadly in Aboriginal and Torres Strait Islander communities. Use of these tools to screen for depression in Aboriginal and Torres Strait Islander peoples cannot currently be recommended.

Additional tools have been developed specifically by and for Aboriginal and Torres Strait Islander peoples that take a strengths-based approach to assessing wellbeing. The two most useful for community settings are the Growth and Empowerment Measure and the Here and Now Aboriginal Assessment.

The **Growth and Empowerment Measure (GEM)**[18] takes a positive wellbeing perspective and includes concepts of connectedness to family and cultural identity. It is currently the only tool to include these.

The **Here and Now Aboriginal Assessment (HANAA)**[19] takes the form of a yarning circle, promoting a conversation in a range of areas relating to social and emotional wellbeing, rather than a series of rated questions. It takes a broad approach to social and emotional wellbeing, but is still oriented toward mental health diagnosis and treatment in mental health settings. The tool has been designed for use by those working in health and mental health services and community-based services. It is a screening tool exploring a range of social and emotional wellbeing domains and is intended to determine if a formal mental health assessment is needed. It is not intended to be diagnostic for depression. The HANAA has been used in a variety of Aboriginal medical services, and appears to be useful and culturally appropriate by those using the tool.[20] It still requires validation in a broad range of settings.

Although further evidence is needed before these tools can be recommended for routine use, healthcare providers may find them useful in promoting discussions with patients about their social and emotional wellbeing. They may be especially useful for clinicians who do not have established relationships within an Indigenous community, and may lack expertise in assessing social and emotional wellbeing. Further, non-Indigenous clinicians must be reminded of the importance of cultural competency and the continual and developmental nature of such awareness when ensuring the safety of their Aboriginal and Torres Strait Islander clients.

Evidence for screening programs for depression

A 2005 Cochrane review concluded that screening or case-finding instruments for depression had little or no impact on the recognition, management or outcome of depression in primary care or hospital settings.[21] Evidence of benefit from screening programs for depression has been demonstrated only in settings where there is a substantial degree of supportive infrastructure. Improved outcomes may be achievable where patients identified by the screening program receive intensive support as part of a multifaceted intervention.[22]

In a more recent systematic review commissioned by the US Preventive Services Task Force (USPSTF),[22,23] the minimum support needed to demonstrate a beneficial effect from depression screening was the availability of a nurse who screened patients, reported the results to the physician, and provided a protocol that facilitated referral for behavioural treatment. Interventions with the greatest beneficial effect tended to be complex.

As a consequence of this review, the USPSTF recommends screening for depression on the basis that the supports and services for intervention are now more widely available. In Australian Aboriginal and Torres Strait Islander communities where there are comprehensive treatment services available, health professionals may wish to screen those at higher risk of depression (Box 4).[24]

It should also be noted that there is evidence to suggest that scores indicative of probable depression detected with one particular screening tool – the Center for Epidemiologic Studies Depression Scale [CES-D], which measures severity of depression – fluctuate, and that 22% of people will not meet the criteria for probable depression two weeks later.[25] Applied more broadly, this suggests that with any screening tool, repeat screening may be needed. The optimal screening frequency is not known.

The USPSTF systematic review found that harms from screening for depression were ‘small to none’.[23] However, there are potential harms from medical treatment. Increased prescription of selective serotonin reuptake inhibitor medications for depression is associated with an increased risk of suicidal ideation and, in older people or those taking concurrent non-steroidal anti-inflammatory drugs, there is an increased risk of upper gastrointestinal bleeding.[22]

Despite uncertainties on optimal screening recommendations, the mainstay of depression care should continue to be the use of a careful clinical assessment. In relation to the care of Aboriginal and Torres Strait Islander people, this assessment must be guided by culturally appropriate tools assessing social

and emotional wellbeing, as described above. Of primary importance is the presence of an ongoing therapeutic relationship. Treatment for depression might include judicious use of antidepressants as part of a management plan that includes ongoing support from skilled healthcare professionals who are aware of the local culture and context.

A core component to team-based care in Aboriginal and Torres Strait Islander health includes contributions from Aboriginal health practitioners. Referral pathways to local social and emotional wellbeing teams, psychologists and mental health workers will also be important. There is increasing evidence that online therapies based on cognitive behavioural therapy methods are effective,[26] and these may be useful for some people where they are able to access it.

Given the disproportionately high prevalence of stressors and trauma experienced by Aboriginal and Torres Strait Islander peoples, and the knowledge that current assessment tools are not always culturally appropriate, it is reasonable to ensure that those who are at higher risk are assessed for symptoms of depression. The people in whom depression risk is greater and the situations in which depression is more likely to be missed are outlined in Box 4. These are the people for whom asking about symptoms is recommended.

Box 4. People in whom depression risk is greater[24]

- Exposure to adverse psychosocial events, such as unemployment, divorce or poverty
- A previous history of depression or suicide attempts
- A history of physical or sexual abuse
- A history of substance misuse
- Presence of other chronic diseases, including chronic pain
- Multiple presentations to health services may also be an indicator of depression

Factors that make it more likely that depression will be missed include:

- Limited consultation time
- Presentations of mostly physical or atypical symptoms
- Health professional attitudes – for example, the belief that nothing can be done, or that depression is a normal response to stress
- Communication difficulties

Interventions

There is insufficient evidence to recommend behavioural programs to prevent depression. There is weak evidence that psychosocial interventions in the elderly may have a small effect on preventing depression.[27] There is some evidence that exercise is mildly beneficial in the prevention of depression for children and adolescents,[28] although there is little research exploring this impact with regard to Aboriginal and Torres Strait Islander people.

There is currently limited evidence that interventions targeting children and adolescents in other settings such as communities, schools and workplaces are effective for children or adolescents in the long term.[29] There is weak evidence that social activities for older people can produce statistically significant reductions in symptoms of depression; however, the magnitude of effect is unlikely to be clinically significant.[27]

There is no evidence to support the use of antidepressant medication for primary prevention of depression in the general population.

Recommendations: Prevention of depression					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Screening	All people aged ≥15 years	Universal screening for depression is not recommended. Identify those people in whom the risk of depression is greater (Box 4)	As part of annual health assessment	IB	22
				GPP	30
	People in whom depression risk is greater (Box 4)	For those with a higher risk of depression, ask about symptoms of depression. Consider using one of the 'social and emotional wellbeing' or mental health assessment tools to guide the conversation. Options include the Kessler Psychological Distress Scale (K-5) (Box 2), the Here and Now Aboriginal Assessment (HANAA) tool, the Patient Health Questionnaire 9 (PHQ-9), PHQ-9 adapted (Box 3), and the PHQ-2 (refer to 'Resources')		GPP	24
Behavioural	All people aged ≥15 years	Behavioural interventions are not recommended for primary prevention of depression		ID	27–29
Chemo-prophylaxis	All people aged ≥15 years	Medications are not recommended for primary prevention of depression		GPP	
Environmental	All people aged ≥15 years	Community-based psychosocial programs are not recommended for primary prevention of depression		IC	27, 29

Resources

- beyondblue, Aboriginal and Torres Strait Islander mental health resources, www.beyondblue.org.au/who-does-it-affect/aboriginal-and-torres-strait-islander-people
- Black Dog Institute, www.blackdoginstitute.org.au
- Brown AD, Mentha R, Rowley KG, Skinner T, Davy C, O'Dea K. Depression in Aboriginal men in central Australia: Adaptation of the Patient Health Questionnaire 9. BMC Psychiatry 2013;13(1):271, https://bmcpsychiatry.biomedcentral.com/articles/10.1186/1471-244X-13-271
- Department of Health, Kessler Psychological Distress Scale (K5), www.pmhc-mds.com/doc/pmhc-scoring-k5.pdf
- eheadspace – online resource for young people wanting advice on mental health, www.eheadspace.org.au
- Head to Health – Australian digital mental health resources, https://headtohealth.gov.au
- Here and Now Aboriginal Assessment (HANAA) tool – to obtain copy of HANAA tool and guidelines, email Winthrop Professor Aleksandar Janca (aleksandar.janca@uwa.edu.au) or Assistant Professor Zaza Lyons (zaza.lyons@uwa.edu.au)
- Lifeline, www.lifeline.org.au
- The Royal Australian College of General Practitioners (RACGP), General Practice Mental Health Standards Collaboration – for training in mental health for general practitioners, www.racgp.org.au/education/gpmhsc
- Telethon Kids Institute, Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice, www.telethonkids.org.au/globalassets/media/documents/aboriginal-health/working-together-second-edition/working-together-aboriginal-and-wellbeing-2014.pdf

Prevention of suicide

Background

There were very few reports of suicide among Aboriginal and Torres Strait Islander peoples prior to the 1960s. Suicide rates began increasing in the late 1980s[31] and now Aboriginal and Torres Strait Islander peoples die from suicide at a rate of 23 per 100,000.[11] After adjusting for age, this is twice the rate of the non-Indigenous population.[11] Hospitalisation for intentional self-harm is at least 2.5 times higher for Aboriginal and Torres Strait Islander people than for non-Indigenous Australians. The overall mortality rates from suicide in Aboriginal and Torres Strait Islander peoples are also twice as high as for non-Indigenous Australians, and are almost entirely among young Aboriginal and Torres Strait Islander people.[5]

Given these high rates of death by suicide, it is crucial to understand the causes and to run effective prevention programs. The Aboriginal and Torres Strait Islander Suicide Prevention Evaluation Project (ATSISPEP)[6] was carried out by Aboriginal and Torres Strait Islander researchers and mental health professionals from the University of Western Australia. Based on numerous community consultations and roundtables, and a review of the evidence, it sets out a comprehensive summary of the evidence on suicide prevention in Aboriginal and Torres Strait Islander communities across Australia. While suicidal ideation and acts of self-harm do bring people into contact with health services, and are closely associated with mental health problems, the underlying problems are not predominantly medical. Important and often overlooked antecedents relate to historical and contemporary colonising policies and practices, forced removal from ancestral lands, and forced removal of children from families. The resulting, and indeed continuing, intergenerational trauma and disempowerment results in a range of health problems, and contributes to the increased rate of suicide and self-harm.[32]

Research from mainly remote Aboriginal communities suggests that suicide and suicidal behaviour are not well explained by biomedical concepts of mental health and are influenced by sociocultural phenomena specific to those communities.[6] Suicide in Aboriginal and Torres Strait Islander communities therefore needs health services and health professionals to understand the ongoing effects of colonisation, exclusion and disadvantage, and their health consequences. This can be difficult for non-Indigenous health professionals to put into practice and, consequently, makes it difficult to implement preventive measures as they tend to be based on biomedical models of care and may not meet community expectations. This may adversely affect help-seeking behaviour such that well-intentioned suicide prevention strategies can actually do harm.[33,34] Suicide prevention measures are only likely to succeed if they are developed and implemented by the local Aboriginal and Torres Strait Islander community. In fact, the ATSISPEP report recommends that suicide prevention projects in Australian Indigenous communities that are not led by the community themselves should not proceed. This underscores the importance of health practitioners working closely with the local Aboriginal and Torres Strait Islander mental health workforce or social and emotional wellbeing teams, and privileging the knowledge and experience of these people.

It is clear that all health professionals consulting Aboriginal and Torres Strait Islander patients are very likely to treat people who have personal experience of suicide, either in friends or family, or in thoughts or an attempt themselves. Clearly, then, health professionals have an obligation to ensure they maintain cultural competency through ongoing training and feedback within their local communities.

Health professionals are also often influential locally in the development of programs and policies, and so have an opportunity to advocate effectively that local Aboriginal and Torres Strait Islander community leadership is crucial for success in any suicide prevention program.

Evidence from population studies strongly suggests that improving access to primary healthcare services in general, and mental health services in particular, is associated with reduced suicide rates.[35] This is particularly relevant for Aboriginal and Torres Strait Islander peoples, who access health services less frequently than non-Indigenous people prior to a suicide attempt.[36] It is crucial, then, that all primary care services are accessible and affordable, and are culturally safe places for Aboriginal and Torres Strait Islander peoples to attend, to maximise the likelihood of attendance for those at risk.

There is also evidence that education of 'gatekeepers' can improve knowledge about suicidal behaviour. This is the training of specific key people in a community, including general practitioners, nurses and Aboriginal and Torres Strait Islander health practitioners on effective responses to people with behaviours indicative of suicidal risk.[6,37]

Screening

Routine screening for suicide risk is not recommended as there is little evidence it reduces rates of intentional self-harm or suicide.[38] The tools available for screening for suicidal ideation have not been assessed for cultural safety when working with Aboriginal and Torres Strait Islander peoples and communities. The tools examined by the USPSTF[39] had low positive predictive values – 33% being the highest – meaning many false positive screening test results. The performance of these tools in adolescents was even worse, which would particularly limit their effectiveness in Aboriginal and Torres Strait Islander communities, even if they were culturally appropriate. No harms arising from the use of screening tests for suicide were identified in the USPSTF systematic review. In an Aboriginal and/or Torres Strait Islander community setting, the harms are even less clear. There is a clear risk, however, in using a tool that is culturally inappropriate, that not only will it be ineffective in identifying those at risk of self-harm, but it could affect help-seeking behaviour. In the absence of any clear evidence on screening, clinicians should use their clinical judgement based on knowledge of the person and their community to assess the risk of suicide. Clinicians must be alert to the possibility of suicide risk and be comfortable discussing this with patients. This is especially true for people with a history of:[37]

- intentional self-harm
- mood disorders and other mental health illnesses, such as schizophrenia
- hazardous alcohol consumption or misuse of other drugs.

In some Aboriginal and Torres Strait Islander communities, the phenomenon of suicide clusters is described, where several people die by suicide in a short space of time. These are thought to be suicides copying the actions of another, often relating to hanging.[31] Practitioners should be aware of this and consider the impact on other community members, and the response of the health service to those affected. The strategy of 'postvention' – intervening/intervention particularly for those affected by a recent suicide or suicide attempt – is important at a time when some people will most need it.[40] (Refer to 'Resources' for useful information for health professionals.) Postvention interventions can be directed to individuals or be community-wide.[41]

Interventions

The ATSISPEP report identified community-wide strategies effective at suicide prevention in Aboriginal and Torres Strait Islander communities. Crucial for success is that programs are led by those communities affected and address the problems they identify. This includes tackling poverty and the social determinants of health, education and awareness raising with programs that do not depend on literacy. Community empowerment, including local Elders and a cultural framework, are also components of successful programs. Local service delivery must be available; but again, this must be led by the community.[42]

There is currently no evidence demonstrating a favourable effect of behavioural interventions for people with suicidal ideation or suicidal behaviour, though there are some promising results for cognitive behavioural therapy or interpersonal therapy for those at risk. However, these studies had high withdrawal rates, which may affect the ability to generalise the findings.[43] There is also some evidence that these interventions may work by enhancing effective contact with those who have suicidal ideation, and that other services such as telephone support or befriending services may also have some positive impact.[44]

Within the context of suicide prevention, chemoprophylaxis relates mainly to the use of pharmacological agents to optimise the management of mental health conditions that may prevent suicidal behaviour or deliberate self-harm. The goal of antidepressant medication is improvement in symptoms and functioning from anxiety or depression, rather than suicide prevention per se. Populations with higher rates of antidepressant prescribing have lower suicide rates, but there is no evidence that individuals prescribed

antidepressants are at less risk of suicide. Indeed, in some people, especially adolescents, suicidal ideation may be increased if selective serotonin reuptake inhibitor antidepressants are used.[45] There is no reliable evidence that pharmacological treatment is effective at preventing suicide or deliberate self-harm attempts in people with diagnosed personality disorders, bipolar disorder or schizophrenia.[46–48] The lack of evidence of effect may be limited by the quality of the trials conducted to date. As suicide is a rare event, randomised trials may not be sufficiently powered to detect statistically significant reductions in suicide rates.

There is evidence that certain environmental measures are effective in reducing suicide rates. Interventions shown to be effective include restricting the prescription of potentially lethal medications, restricting access to over-the-counter medications, and legislation to restrict access to toxic chemicals and firearms. However, within an Aboriginal and Torres Strait Islander community context, this may not be as effective, as many of these measures have already been taken, and the majority of suicides among Aboriginal and Torres Strait Islander peoples are by hanging.[42]

Recommendations: Prevention of suicide

Preventive intervention type	Who is at risk?	What should be done?	How often?	Level/ strength of evidence	References
Screening	All people	Screening for suicide risk is not routinely recommended		IC	38, 43
	People with any one of the following: • past history of intentional self-harm • history of mood disorders and other mental health problems • hazardous alcohol consumption or misuse of other drugs • close to someone who has recently died by suicide (postvention)	Consider asking about past and current suicidal ideation and intent as part of a comprehensive medical history (Box 5)	Opportunistic	GPP	37, 38, 40
Behavioural	All people	No specific behavioural interventions are recommended for the prevention of suicide		IC	38
	People with a history of self-harm or suicide attempts People who have close friends or family who have died by suicide	Provide support and referral to social and emotional wellbeing services (particularly access to Aboriginal mental health workers) and other locally available community support groups	Ongoing	IIIC	44
Chemo-prophylaxis	All people	Medication is not recommended for the prevention of suicide beyond a clinically indicated use for diagnosed conditions (eg major mental illness)		IB	45–50

Recommendations: Prevention of suicide					
Preventive intervention type	**Who is at risk?**	**What should be done?**	**How often?**	**Level/ strength of evidence**	**References**
Environmental	Communities	Advocate for community-based strategies to remove access to lethal methods of self-harm, both in the community and the household	Ongoing	IC	37
		Advocate for community-led health-promotion programs that holistically address the multifactorial nature of cultural, social and emotional wellbeing (eg sports events, caring for country programs, healthy lifestyle festivals)	Ongoing	GPP	
	Health services	Provide education so that primary healthcare professionals can recognise and respond to psychosocial distress and depression	Ongoing	IC	37
		Take steps to enhance access to mental health and drug and alcohol services, and social and emotional wellbeing services, through integration with primary healthcare services	Ongoing	GPP	35

Box 5. Ways of asking about suicide

Have you ever felt like this before?

Have you ever felt so bad that you've hurt yourself or tried to kill yourself?

Many people when they feel this bad have thought about hurting themselves or even killing themselves. Has this happened to you?

Other people with similar problems sometimes lose hope. Has this happened to you?

Have you thought about how you would kill yourself?

Have you made any plans?

What stops you from doing that?

And as a follow-up question to many of the others: *Can you tell me more about that?*

Asking about suicide intent does not make it more likely

Resources

- Royal Australian and New Zealand College of Psychiatrists, Aboriginal and Torres Strait Islander mental health, http://indigenous.ranzcp.org
- The Royal Australian College of General Practitioners (RACGP) resources:
  - *Suicide prevention and first aid: A resource for GPs*, www.racgp.org.au/education/gpmhsc/gp-resources/suicide-prevention/
  - *After suicide: A resource for GPs*, www.racgp.org.au/education/gpmhsc/gp-resources/after-suicide
- Telethon Kids Institute, Indigenous suicide rate by postcode 2001–2012, www.indigenoussuicidepreventionmaps.com.au/suicides
- Telethon Kids Institute, *Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice*, www.telethonkids.org.au/globalassets/media/documents/aboriginal-health/working-together-second-edition/working-together-aboriginal-and-wellbeing-2014.pdf
- University of Western Australia, Aboriginal and Torres Strait Islander Suicide Prevention Evaluation Project (ATSISPEP), www.atsispep.sis.uwa.edu.au
- University of Western Australia, Aboriginal and Torres Strait Islander Suicide Prevention Evaluation Project (ATSISPEP) fact sheets on Aboriginal and Torres Strait Islander suicide, and a comprehensive list of organisations and screening tools for use in mental health and social and emotional wellbeing work in Indigenous communities, www.atsispep.sis.uwa.edu.au/resources#ui-id-21
- University of Western Australia, *Solutions that work: What the evidence and our people tell us – Aboriginal and Torres Strait Islander Suicide Prevention Evaluation Project*, www.atsispep.sis.uwa.edu.au/__data/assets/pdf_file/0006/2947299/ATSISPEP-Report-Final-Web.pdf

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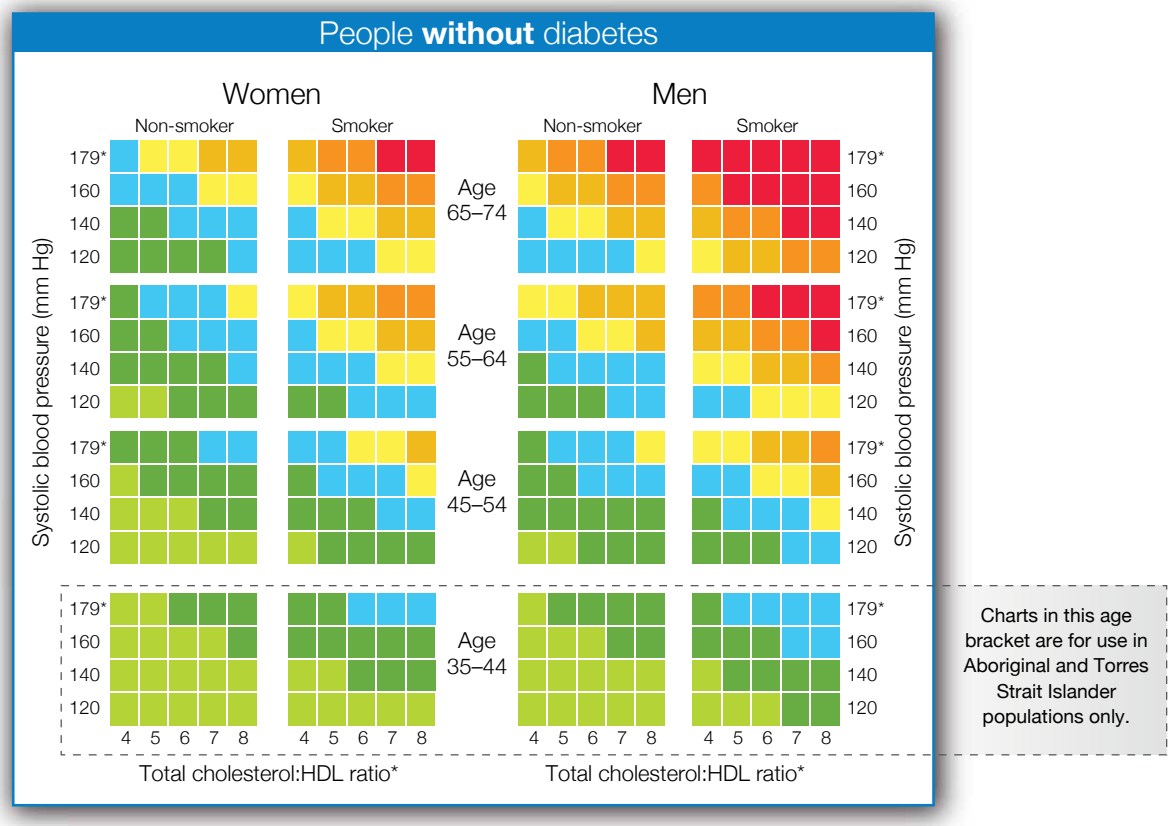
Appendix A: Australian cardiovascular risk charts



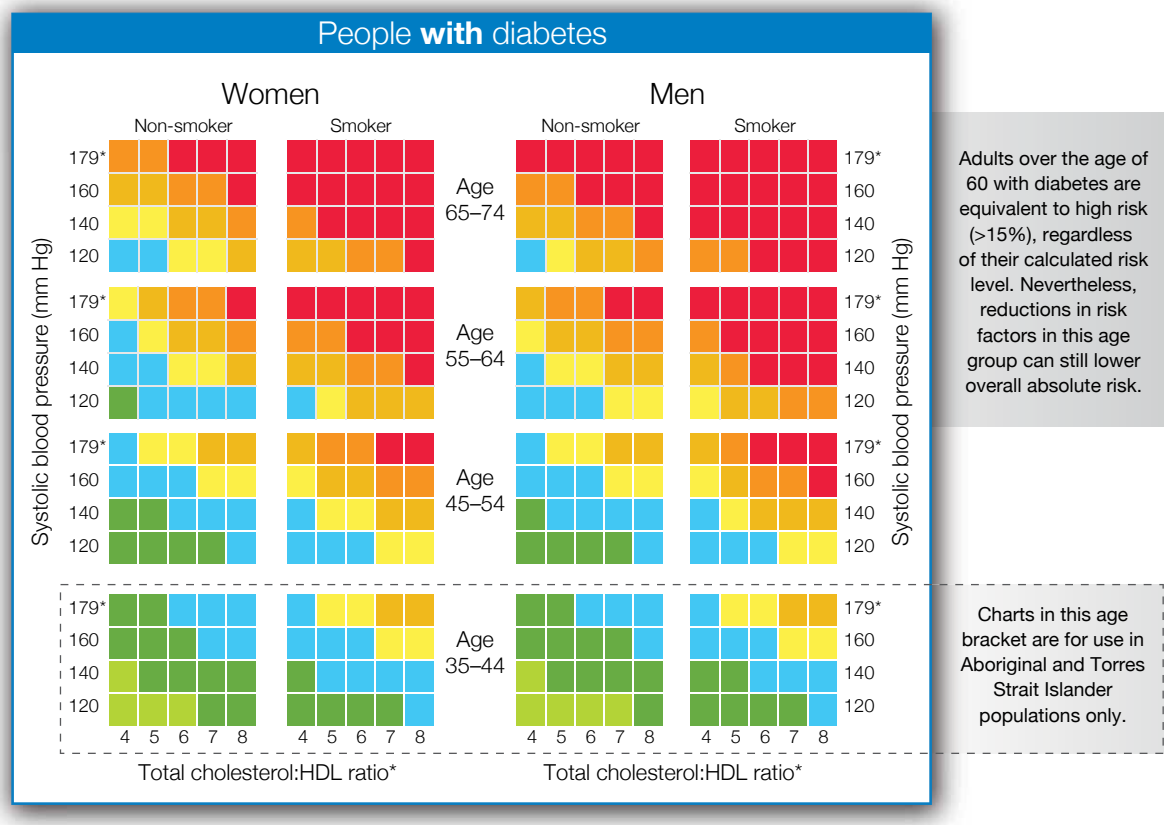
* In accordance with Australian guidelines, patients with systolic blood pressure ≥180 mm Hg, or a total cholesterol of >7.5 mmol/L, should be considered at clinically determined high absolute risk of CVD.

Risk level for 5-year cardiovascular (CVD) risk

High risk	Moderate risk	Low risk
≥30%	10–15%	5–9%
25–29%		< 5%
20–24%		
16–19%		

How to use the risk charts

1. Identify the chart relating to the person's sex, diabetes status, smoking history and age. The charts should be used for all adults aged 45 years or over (and all Aboriginal and Torres Strait Islander adults aged 35 - 74 years) without known history of CVD and not already known to be at clinically determined high risk.
2. Within the chart choose the cell nearest to the person's age, systolic blood pressure (SBP) and total cholesterol (TC):HDL ratio. For example, the lower left cell contains all non-smokers without diabetes who are 34-44 years and have a TC:HDL ratio of less than 4.5 and a SBP of less than 130 mmHg.
3. The colour of the cell that the person falls into provides their five year absolute cardiovascular risk level (see legend above for risk category). People who fall exactly on a threshold between cells are placed in the cell indicating higher risk.



* In accordance with Australian guidelines, patients with systolic blood pressure ≥180 mm Hg, or a total cholesterol of >7.5 mmol/L, should be considered at clinically determined high absolute risk of CVD.

Risk level for 5-year cardiovascular (CVD) risk

High risk	Moderate risk	Low risk
≥30%	10–15 %	5–9%
25–29%		<5%
20–24%		
16–19%		

Notes: The risk charts include values for SBP alone as this is the most informative of conventionally measured blood pressure parameters for cardiovascular risk.

For specific groups, additional guidance includes:
The Framingham Risk Equation has not been validated for all population groups, the assessment score should be interpreted with caution in the following groups:

- The Framingham Risk Equation may **underestimate CVD risk** in Aboriginal and Torres Strait Islander peoples (EBR Grade D); adults with diabetes aged between 45 and 60 years (EBR Grade C); adults aged over 74 years (CBR) however, available evidence suggests that this approach will provide an estimate of minimum cardiovascular risk.
- The Framingham Risk Equation is likely to **underestimate CVD risk** in adults with socioeconomic deprivation (an independent risk factor for cardiovascular disease) (PP) or depression (PP).
- The predictive value of the Framingham Risk Equation **has not been specifically assessed** in adults who are overweight or obese (EBR Grade D).
- The **increased risk of cardiovascular events and all-cause mortality**, in addition to thromboembolic disease including stroke, should be taken into account for adults with atrial fibrillation (particularly those aged over 65 years) (PP).

Reproduced from the Heart Foundation. Australian cardiovascular risk charts. Melbourne: National Heart Foundation, [no date]. Available at https://www.heartfoundation.org.au/images/uploads/publications/aust-cardiovascular-risk-charts.pdf [Accessed 19 February 2018]; reproduced with permission of the National Stroke Foundation.

Appendix B: Chapter authors and expert reviewers

National Guide chapter/section	Author(s)	Expert reviewer(s)
Chapter 1: Lifestyle		
Smoking	Professor David Thomas Co-author: Dr Penny Abbott	Dr Rowena Ivers
Overweight and obesity	Professor David Peiris	Associate Professor Elizabeth Denney-Wilson
Physical activity	Professor David Peiris	Dr Ben Ewald
Alcohol	Dr Lea Merone Co-author: Dr Penny Abbott	Professor Kate Conigrave Professor Mark Harris
Gambling	Dr Jenny Hunt Co-author: Dr Penny Abbott	Professor Malcolm Battersby
Chapter 2: Antenatal care		
	Dr Jenny Hunt	Dr Marilyn Clarke
Chapter 3: Child health		
Immunisation	Dr Marguerite Tracy Co-author: Dr Jenny James	Dr Frank Beard
Anaemia	Dr Marguerite Tracy Co-author: Dr Jenny James	Professor David Atkinson
Growth failure	Dr Marguerite Tracy Co-author: Dr Jenny James	Associate Professor Patrick Patradoon-Ho
Childhood kidney disease	Dr Hasantha Gunasekera	Professor Jonathan Craig
Fetal alcohol spectrum disorder	Dr James Fitzpatrick Dr Rebecca Pedruzzi	Associate Professor Carmela Pestell
Preventing child maltreatment: Supporting families to optimise child safety and wellbeing	Dr Mary Belfrage	Ms Salina Bernard Dr James Fitzpatrick
Chapter 4: The health of young people		
	Dr Annapurna Nori	Professor Sherry Saggers
Chapter 5: The health of older people		
	Dr Emma Fitzsimons	Professor Leon Flicker
Chapter 6: Eye health		
	Dr Naomi Houston Dr Nitya Malhotra	Professor Hugh Taylor
Chapter 7: Hearing loss		
	Professor Amanda Leach	Associate Professor Kelvin Kong

National Guide chapter/section	Author(s)	Expert reviewer(s)
Chapter 8: Oral and dental health		
	Dr Sandra Meihubers	Dr Simon Wooley
Chapter 9: Respiratory health		
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Influenza prevention	Dr Vicki Slinko	Professor Paul Torzillo
Asthma	Professor Anne Chang	Professor Graeme Maguire
Chronic obstructive pulmonary disease	Dr Penny Abbott	Professor Graeme Maguire
Bronchiectasis and chronic suppurative lung disease	Professor Anne Chang	Professor Graeme Maguire
Chapter 10: Rheumatic fever and rheumatic heart disease		
	Dr Malcolm McDonald	Professor Jonathan Carapetis
Chapter 11: Cardiovascular disease prevention		
	Professor David Peiris	Dr Andrew Boyden Professor Anthony Rodgers
Chapter 12: Type 2 diabetes prevention and early detection		
	Dr Justin Coleman	Dr Lydia Scott
Chapter 13: Chronic kidney disease prevention and management		
	Professor Tim Usherwood	Professor Alan Cass
Chapter 14: Sexual health and blood-borne viruses		
	Dr Jacki Mein Dr Lea Merone	Associate Professor Lewis Marshall Dr Steven Skov
Chapter 15: Prevention and early detection of cancer		
Prevention and early detection of cervical cancer	Dr Nadia Lusis	Professor Gail Garvey Dr Lisa Whop
Prevention and early detection of liver (hepatocellular) cancer	Dr Nadia Lusis	Professor Greg Dore
Prevention and early detection of breast cancer	Dr Nadia Lusis	Professor Jenny Reath
Prevention and early detection of colorectal (bowel) cancer	Dr Nadia Lusis	Professor Bruce Armstrong
Early detection of prostate cancer	Dr Nadia Lusis	Professor Bruce Armstrong
Prevention of lung cancer	Dr Nadia Lusis	Professor Kwun Fong
Chapter 16: Family abuse and violence		
	Dr Elizabeth Hindmarsh	Ms Summer May Finlay Professor Kelsey Hegarty
Chapter 17: Mental health		
	Dr Tim Senior	Professor Ernest Hunter

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