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Second edition
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The Royal Australian College of General Practitioners
College House
1 Palmerston Crescent
South Melbourne VIC 3205 Australia
Tel 03 8699 0414
Fax 03 8699 0400
www.racgp.org.au

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Project management
Dr Sophie Couzos, Public Health Medical Officer, National Aboriginal Community Controlled Health Organisation
Ms Lauren Cordwell, Manager, the RACGP National Faculty of Aboriginal and Torres Strait Islander Health

Clinical editor
Dr David Peiris, The George Institute for Global Health, on behalf of NACCHO, Tharawal Aboriginal Corporation

Project coordination
Ms Jill Dixon, National Advisor, the RACGP National Faculty of Aboriginal and Torres Strait Islander Health
Ms Nikola Merzliakov, Projects and Community Relationships Coordinator, the RACGP National Faculty of Aboriginal and Torres Strait Islander Health

Editorial committee
Dr David Peiris, Dr Sophie Couzos and Dr Tim Senior

Authors
Dr Penny Abbott, Aboriginal Medical Service Western Sydney
Professor Anne Chang, Menzies School of Health Research
Dr Justin Coleman, Inala Indigenous Health Service
Dr Sophie Couzos, National Aboriginal Community Controlled Health Organisation
Dr Emma Fitzsimons, Danila Dilba Health Service
Dr Gabrielle Hall, locum general practitioner, Aboriginal Community Controlled Health Services
Dr Jenny James, Aboriginal Medical Service Western Sydney
Dr Nadia Lusis, Victorian Aboriginal Community Controlled Health Organisation
Dr Sandra Meihubers, dental public health consultant
Dr Jacki Mein, Apunipima Cape York Health Council
Dr Annapurna Nori, Nunkuwarrin Yunti
Dr David Peiris, The George Institute for Global Health, on behalf of NACCHO, Tharawal Aboriginal Corporation
Dr Eileen Rafter, Wuchopperen Health Service
Dr Tim Senior, Tharawal Aboriginal Corporation
Professor Tim Usherwood, University of Sydney
Dr Nicolette de Zoete, Kimberley Aboriginal Medical Services Council
Reviewers
The following people and organisations contributed information that was used in the National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people and/or reviewed various drafts of this publication which were addressed by authors and the Editorial Committee.

Expert reviewers
Professor Bruce Armstrong
Professor Malcolm Battersby
Professor Jonathan Carapetis
Dr Vijenti Chandra
Professor Stephen Colagiuri
Mrs Patricia Delaney
Professor Gregory Dore
Dr Hasantha Gunasekara
Dr Warren Jennings
Dr Dina LoGiudice
Associate Professor Peter Morris
Professor Sherry Saggers
Professor Hugh Taylor
Associate Professor Mark Thomas
Mr James Ward

Professor David Atkinson
Dr Alex Brown
Associate Professor Wendy Cavilla
Professor Anne Chang
Associate Professor Kate Conigrave
Dr Elizabeth Denney-Wilson
Dr Ben Ewald
Dr Rowena Ivers
Associate Professor Amanda Leach
Dr Vivienne Manessis
Professor Kaye Roberts-Thomson
Dr Steven Skov
Associate Professor David Thomas
Professor Andrew Tonkin

Organisational reviewers
Professor David Atkinson, Australian College of Rural and Remote Medicine and Kimberley Aboriginal Medical Services Council
Professor Bob Batey, Australasian Society for HIV Medicine
Dr Stephen Carbone, Victorian Aboriginal Community Controlled Health Organisation
Dr Sophie Couzos, NACCHO
Mr William Darbishire, The Australian Lung Foundation
Mr Brian Dooley, Heart Support Australia

Editorial Committee. Queensland Health, Royal Flying Doctor Service of Australia (Queensland Section) and Apunipima Cape York Health Council. Chronic Disease Guidelines. 3rd edition, 2010

Healthcare and Education Committee, Diabetes Australia
Dr Robert Grenfell, National Heart Foundation of Australia
Professor David Johnson, Caring for Australasians with Renal Impairment
Dr Erin Lalor, National Stroke Foundation and National Vascular Disease Prevention Alliance
Associate Professor Tim Mathew, Kidney Health Australia
Dr Liz Moore, Aboriginal Medical Services Alliance Northern Territory
Ms Paula Murray, Asthma Foundation
Dr Cathy Pell, Australasian Society for HIV Medicine
Professor David Roder, Cancer Council Australia
Ms Janet Struber, Central Australian Rural Practitioners Association
Dr Katie Panaretto, Queensland Aboriginal and Islander Health Council

**Adult and child preventive health lifecycle charts**
Ms Nikola Merzliakov, the RACGP

**The Royal Australian College of General Practitioners Project Reference Group**
The following people participated in Project Reference Group meetings to direct the implementation of the project:
Ms Dea Delaney Thiele (chair), NACCHO
Ms Donna Ah Chee (chair), NACCHO
Dr Sophie Couzos, NACCHO
Dr David Peiris, The George Institute for Global Health on behalf of NACCHO
Associate Professor Brad Murphy, the RACGP National Faculty of Aboriginal and Torres Strait Islander Health
Professor Mark Harris, University of New South Wales
Dr Joy Eshpeter, Office for Aboriginal and Torres Strait Islander Health
Dr Kerryn Coleman, Office for Aboriginal and Torres Strait Islander Health
Dr Nadia Lusis, Victorian Aboriginal Community Controlled Health Organisation
Dr John Daniels, Redfern Aboriginal Medical Service
Dr Jiri Rada, the RACGP Foundation
Professor David Atkinson, Kimberley Aboriginal Medical Service Council and Australian College of Rural and Remote Medicine
Ms Lauren Cordwell, the RACGP National Faculty of Aboriginal and Torres Strait Islander Health
Ms Jill Dixon, the RACGP National Faculty of Aboriginal and Torres Strait Islander Health
Ms Nikola Merzliakov, the RACGP National Faculty of Aboriginal and Torres Strait Islander Health

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Ms Donna Ah Chee (Chief Executive Officer, NACCHO)
Ms Dea Thiele (former Chief Executive Officer, NACCHO)
Mr Justin Mohamed (Chair, NACCHO)
NACCHO Board of Directors
The RACGP National Faculty of Aboriginal and Torres Strait Islander Health Board
The RACGP National Standing Committee – Quality Care
The RACGP Council
Australian College of Rural and Remote Medicine

NACCHO and the RACGP acknowledge the contribution made by the following RACGP staff:
Ms Jill Dixon, National Advisor, National Faculty of Aboriginal and Torres Strait Islander Health
Ms Helen Bolger-Harris, Manager, Clinical Improvement Unit
Mr Stephan Groombridge, Program Manager, Quality Care
Ms Nikola Merzliakov, Projects and Community Relationships Coordinator, National Faculty of Aboriginal and Torres Strait Islander Health
Ms Denese Warmington, Managing Editor, Publications Unit
Mr Jason Farrugia, Senior Graphic Designer, Publications Unit
Ms Morgan Liotta, Production Coordinator, Publications Unit

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Foreword

It is my pleasure to release the second edition of the National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people for use throughout Australia. This valuable resource is the product of intense research by authors with experience within Aboriginal Community Controlled Health Services, and by the continued collaboration between the National Aboriginal Community Controlled Health Organisation (NACCHO) and The Royal Australian College of General Practitioners (RACGP).

The prevention of disease is a core element of primary healthcare. For over four decades, Aboriginal Community Controlled Health Services have provided comprehensive and culturally appropriate primary healthcare to Aboriginal and Torres Strait Islander people. They know what works and how services must be delivered to reach those who are most vulnerable.

The National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people will assist health providers in unlocking the health system – the socioeconomic, geographical and health literacy barriers that prevent many Aboriginal and Torres Strait Islander people from accessing the services and the opportunities to be healthy to the same extent as other Australians. Supported by the latest national and international evidence and good practice points, the guide will assist health providers to maximise the opportunity for the prevention of disease at each clinic visit, and inform the set-up of information management systems for prevention of disease throughout a patient’s lifespan.

The National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people was conceived and started by NACCHO in 2001 and went on to be supported by the RACGP from 2002. The first edition was published in 2005 and has proven to be widely used by health services and health policy makers to inform best practice in preventing disease in Aboriginal and Torres Strait Islander populations. This second edition has been significantly updated and improved, with appraisal and endorsement from peak bodies across Australia.

On behalf of the NACCHO Board of Directors, I wish to acknowledge the efforts of the RACGP, who worked with NACCHO to update this resource and commend the National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people. I encourage health providers to implement its recommendations to bring about significant improvements in health service access and health status for the Aboriginal and Torres Strait Islander population.

Mr Justin Mohamed, Chair
National Aboriginal Community Controlled Health Organisation
May 2012
Introduction

The review and updating of the first (2005) 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) National Faculty of Aboriginal and Torres Strait Islander Health. The National Guide is a practical resource intended for all health professionals delivering primary healthcare to Aboriginal and/or Torres Strait Islander people. Its purpose is to provide GPs and other health professionals with an accessible, user-friendly guide to best practice in preventive healthcare for Aboriginal and Torres Strait Islander patients.

This second edition of the National Guide comprises:

- the National Guide, which contains evidence statements, recommendations, risk calculation tables and an outline of the development of the guide
- the evidence base: the collection of evidence underpinning the guide and recommendations (electronic only) (see the Methodology section ‘Searching the evidence base and drafting recommendations’)
- a child and adult lifecycle summary chart listing activities recommended at each age group.


The National Guide is being integrated into clinical software over time to support primary healthcare professionals to implement best practice by providing them with accessible, accurate and up-to-date preventive health information relevant to Aboriginal and Torres Strait Islander people. For further information contact the RACGP National Faculty of Aboriginal and Torres Strait Islander Health on 03 8699 0499 or email aboriginalhealth@racgp.org.au.

Purpose

The National Guide is intended for all health professionals delivering primary healthcare to the Aboriginal and Torres Strait Islander population. This includes general practitioners (GPs), Aboriginal and Torres Strait Islander health workers, nurses and those specialists with a role in delivering primary healthcare. The National Guide makes specific recommendations regarding the elements of a preventive health assessment across the lifecycle of the Aboriginal and Torres Strait Islander population.

The aim of the National Guide is to provide an up-to-date, evidence-based national resource that can help inform health providers and policy makers on a defined set of activities that are of particular relevance to Aboriginal and Torres Strait Islander people.

These activities may 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 people is very similar to that of the Aboriginal population, and the information in the National Guide can be applied to both population groups.
How to use the guide

Using the recommendations
All health professionals delivering primary healthcare to Aboriginal and/or Torres Strait Islander patients 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 (the ‘red book’) by dealing with health issues that are specific to the Aboriginal and Torres Strait Islander population.

Cross referencing with the RACGP 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/guidelines/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
Healthcare providers (particularly in regional and remote areas) are also encouraged to refer to local guidelines, where appropriate and available, in order to optimise preventive health assessments. 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 patient who was raised in a trachoma endemic area (see Chapter 6: Eye health). Consequently, many recommendations highlight the importance of clinical discretion in decision making.

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 patients. Providers may also benefit by appraising certain screening activities for which there are ‘good practice points’ (ie. 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, such as risk factor modification and immunisation programs.

Why preventive health assessments are necessary
A systematic and comprehensive approach to prevention
There is strong evidence that the delivery of clinical preventive health services improves health outcomes. These services include immunisation, screening for asymptomatic disease, chemoprophylaxis (using medication to prevent the onset of disease), counselling and other ways to encourage patient behavioural change, as well as primary healthcare influences over environmental factors.

See the Methodology section ‘Developing recommendations’.
Opportunity to improve Aboriginal and Torres Strait Islander health equality

Primary care providers often miss opportunities for the prevention of chronic disease and associated complications in the Aboriginal and Torres Strait Islander population, and miss opportunities to identify if patients are of Aboriginal and/or Torres Strait Islander origin.

Health service utilisation data indicate that Aboriginal and Torres Strait Islander people are high users of publicly provided services such as public hospitals and community health services and low users of medical, pharmaceutical, dental and other health services that are, for the most part, privately provided.\(^1\)

Overall, in 2008–09, the potentially preventable hospitalisation rate for Aboriginal and Torres Strait Islander people (14 564 per 100 000 population) was 4.9 times the rate for other Australians (2956 per 100 000).\(^2\) Potentially preventive chronic diseases and injury are conditions causing the greatest proportion of excess deaths for Aboriginal and Torres Strait Islander people.\(^3\)

Despite the overall health needs being higher for Aboriginal and Torres Strait Islander people, in 2008–09, average Medicare Benefits Schedule (MBS) expenditure per person was $363 for Aboriginal and Torres Strait Islander people and $621 for non-Indigenous Australians, a ratio of 0.58.\(^1\) The average Pharmaceutical Benefits Schedule (PBS) expenditure per person was $250 for Aboriginal and Torres Strait Islander people and $338 for non-Indigenous Australians, a ratio of 0.74.\(^1\)

When preventive opportunities are missed, this can lead to a higher dependency on hospital care, which 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.\(^2\) Consequent life expectancy is much lower – Aboriginal and Torres Strait Islander males in 2005–07 had a life expectancy of 67 years, 11.5 years fewer than non-Indigenous males\(^2\) (based on the Australian Bureau of Statistics revised ‘direct method’ to account for the under-identification of Aboriginal and Torres Strait Islander deaths adopted in 2009).

Return on investment

Many chronic diseases within the Aboriginal and Torres Strait Islander population are unrecognised by patients. This has been well documented for diseases known for their insidious onset, such as diabetes, hypertension, cardiovascular disease and chronic renal failure. The preventive approach requires the ‘service to seek the patient’ while the patient is asymptomatic. It involves activity for primary prevention (to prevent the onset of disease), secondary prevention (to detect preclinical disease for cure or prevention of disease progression) and to a less extent, tertiary prevention (to minimise the consequences for those who already have disease). Preventive health assessments also involve the assessment of comorbidities in patients who already have a chronic disease.

The preventive approach to health has shown return on investment in non-Indigenous Australians, especially federal expenditure on immunisation, public health campaigns and the incorporation of preventive measures into primary care.\(^4\) Aboriginal and Torres Strait Islander people have a significant capacity to benefit from preventive healthcare. Given the reduced access to preventive healthcare by Aboriginal and Torres Strait Islander people and the huge burden of undiagnosed disease, effort needs to focus on measures to ensure that Aboriginal and Torres Strait Islander patients who are symptomatic of disease,
as well as those who do not yet know they have disease (subclinical), have access to help.

**Identifying Aboriginal and Torres Strait Islander patients**

Implementing 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 number of correctly identified patients. Identifying Aboriginal and Torres Strait Islander status is a necessary precondition for participating in the Closing the Gap initiative, agreed 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 measures in the Australian Government’s Indigenous Chronic Disease Package. These include key measures available under the Practice Incentives Program Indigenous Health Incentive and PBS Co-payment Measure. For more information see www.medicareaustralia.gov.au/provider/incentives/pip/forms-guides.jsp#N10068.

The RACGP paper, Identification of Aboriginal and Torres Strait Islander people in Australian general practice, assists health professionals in identifying Aboriginal and Torres Strait Islander patients; this is available at www.racgp.org.au/aboriginalhealth.

All health professionals have an important role in facilitating the identification of Aboriginal and Torres Strait Islander patients. 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. Several guidelines have been developed to assist GPs with this issue.

**Implementing preventive health interventions**

Most preventive interventions are efficiently delivered opportunistically in the clinical encounter where primary healthcare services are available. 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**

Implementing preventive health assessment and interventions ideally involves strategies for both patients and healthcare providers. Usually multiple strategies are most effective, as exemplified by those used to increase adult vaccination (see Chapter 11: Respiratory health). These strategies may include opportunistic screening (case finding) and reminder systems within clinic settings, as well as outreach programs such as vaccination in non-traditional settings.

A preventive assessment may be undertaken in a single session between patient 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 patient in recognition of the interdependence of many risk factors and determinants of disease.

**Undertaking interventions**

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. Providers should 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 for the screening and adequate counselling provided when the patient is advised of the result.

**Appropriate health policies**

A supportive health policy is critical to implementing a preventive health assessment. Examples include financial incentives and workforce support. Those who have been screened need to be treated, so an effective screening program will increase the demand for care, yet many health services for Aboriginal and Torres Strait Islander people are under-resourced. Plans to reduce premature and excess Aboriginal and Torres Strait Islander morbidity and mortality need to include investment in the management of previously unrecognised diseases.

**Medicare and the Practice Incentives Program Indigenous Health Incentive**

General practitioners may undertake preventive activities recommended in the National Guide as part of their usual consultations. Medicare benefits are payable for a medical examination or test on a symptomless patient by that patient’s own medical practitioner in the course of normal medical practice, to ensure the patient receives any medical advice or treatment necessary to maintain his/her state of health.

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 (Medicare Item 715). General practitioners are advised to check the requirements in the current online MBS before claiming these items. They need to be aware of, and comply with, the requirements of the specific MBS descriptors when providing services. The National Guide contains advice on almost all elements of the requirements to claim this rebate.

Other MBS rebates can support preventive health assessments of the Aboriginal and Torres Strait Islander population, including:

- telehealth rebates (eg. item 2100)
- follow up assessments by allied health professionals including Aboriginal and Torres Strait Islander health workers (AHWs) across Australia (eg. item 81300) or AHWs in the Northern Territory only or practice nurses (eg. item 10987)*
- follow up of GP management plans by AHWs across Australia (eg. item 10950) or AHWs in the Northern Territory only (eg. item 10997)*
- immunisation by AHWs in the Northern Territory only (eg. item 10988)*
- antenatal services in RRMA 3–7 areas by AHWs in the Northern Territory only* (or midwives/nurses) (eg. 16400).

In addition, preventive health assessments can be supported through ‘CTG’ scripts, which provide copayment relief for PBS prescriptions for patients who identify as Aboriginal and/or Torres Strait Islander. Health services can also receive incentive payments for identifying Aboriginal and/or Torres Strait Islander patients and offering these patients a health assessment. The Practice Incentives Program is outlined at www.medicareaustralia.gov.au/provider/incentives/pip/index.jsp.

* Check MBS eligibility requirements. The Australian Health Practitioner Regulation Agency is currently nationally registering Aboriginal and Torres Strait Islander health practitioners, which may affect the eligibility of AHWs (those not registered as ‘practitioners’) to claim MBS rebates, while broadening eligibility for practitioners.
Methodology

The review and updating of the first (2005) edition of the *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* was undertaken by NACCHO and the RACGP in 2010, and funded by the Office for Aboriginal and Torres Strait Islander Health. It 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 Office for Aboriginal and Torres Strait Islander Health, the Australian College of Rural and Remote Medicine and selected Aboriginal Community Controlled Health Services and GP representatives.

The development of the second edition comprised three stages:

- Review of the first edition of the National Guide
- Evidence review and formulation of recommendations
- Editorial review, expert review and stakeholder consultation.

Review of the first edition

A formal review of the first edition of the National Guide was conducted to determine current usage and how the structure, content and modes of dissemination could be improved. An online survey involving 86 healthcare practitioners – comprising GPs, nurses and AHWs – was conducted in September 2010. Following this, 11 key informant interviews were conducted with a purposive sample to gain a more in-depth understanding of ways to improve the National Guide. A diverse sample was sought to include representatives from Aboriginal Community Controlled Health Services, other Aboriginal health services, general practices and government departments working in urban, rural and remote settings. Some key findings from this consultation process are summarised below.

Use of the National Guide varied considerably, with staff from Aboriginal Community Controlled Health Services reporting greatest usage. A range of health professionals accessed the National Guide including GPs, public health medical officers, practice nurses and AHWs. The National Guide was used for clinical care, teaching, developing policies and guidelines for best practice, general information, designing health practice protocols, and developing research and quality improvement questions. Features that made the National Guide easy to use included the summary charts, layout and provision of evidence for recommendations and its use as a resource when explaining health issues with staff, patients, students and trainees. The main barriers to use included general lack of awareness of the National Guide, out-of-date recommendations, excessively ‘busy’ charts and summaries, and a lack of electronic integration with clinical software.
Suggestions to improve the content included:
- provision of more regular updates
- a summary of disease burden data
- practical actions that primary care practitioners can undertake to improve access to best practice care, including activities that can be undertaken by non-medical staff.

Formatting suggestions included:
- the provision of practice points
- arranging the content in themes
- evidence of recommendations to be provided in a full reference document.

It was generally considered important that the National Guide be accessible in a range of formats to enhance accessibility. Both print and electronic versions were considered necessary. Incorporation into clinical software was frequently suggested as an effective publication method. Respondents also felt that greater awareness of the National Guide could be attained through public presentation opportunities and a targeted marking strategy to various primary care stakeholders. While most respondents considered it important to have a separate preventive health guide for Aboriginal and Torres Strait Islander people, a number of people recommended greater consistency in recommendations between it and the RACGP Guidelines for preventive activities in general practice (‘red book’).9

Evidence review and formulation of recommendations

Defining the scope
The review of the first edition of the National Guide underscored the importance of providing practical recommendations to primary care practitioners in the prevention of disease affecting Aboriginal and Torres Strait Islander people. The focus is on health issues that were preventable and amenable to primary healthcare intervention and contributed greatly to the morbidity and mortality of Aboriginal and Torres Strait Islander people. Existing topic areas from the first edition were reviewed by the project reference group and all were considered appropriate for inclusion in the second edition. It was agreed that the following new topics would also be included: antenatal care, adolescent health, rheumatic heart disease prevention, asthma, depression prevention, bronchiectasis and the health of older people.

Despite its breadth, for mainly practical reasons related to time and resource constraints, it was not possible to include a number of other important preventive health issues. Examples include genetic testing, pre-conception counselling, certain cancers and urinary incontinence. Readers are therefore encouraged to consult other preventive health guides for advice in these areas.

Preventive activities are typically classified as:10

Primary prevention, which avoids the development of a disease. Population-based health promotion activities are examples of primary preventive measures.

Secondary prevention, which focuses on early disease detection 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 the National Guide was on primary prevention activities. Additionally, for some topic areas, it was considered important to include secondary prevention activities if these were considered effective, feasible to implement and able to make a substantial contribution to reduction in overall disease burden. For example, it is well established that a large number of cardiovascular disease (CVD) events occur in people who have had a prior event and consequently secondary prevention interventions targeting this group play a key role in reducing overall CVD-related disease burden. Thus, a pragmatic approach was taken for each topic area to determine if any 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.

Developing recommendations

Preventive interventions were:

- classified according to their type and assessed for their effectiveness based on critical review of established guidelines and empirical literature (see ‘appraisal process’)
- 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.11

- **Immunisation** involves the administration of vaccines to prevent the onset of infectious disease.
- **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.
- **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.
- **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 and the use of antiviral drugs to prevent influenza.
- **Environmental** influences include community and public health focused 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.
include community based programs to ensure improved food supply, school based interventions, implementation of systematic recall and reminder system, advocacy to government stakeholders for local/regional liquor licencing regulations, and involvement of the health service in social marketing activities.

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

The National Guide was developed with the view that there had to be specific evidence against generalising national and international recommendations, before interventions were deemed not to apply to Aboriginal and Torres Strait Islander populations. Further, the vast heterogeneity of Aboriginal and Torres Strait Islander populations means that statements based purely on genetic predisposition to disease are generally unhelpful. Individual predisposing risk factors such as family history and genetic markers may, however, be relevant.

Factors to consider when assessing whether the evidence was 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 sociocultural factors might predicate a different approach
- whether the effectiveness of the intervention is known to exhibit wide variation depending on geographical region.

**Relevance and applicability to primary healthcare**

Interventions were also assessed for the context of service delivery in which they would be principally implemented. Some preventive activities, although clearly linked to improved health outcomes, were omitted because they are generally implemented outside the primary healthcare context. Examples include screening for tuberculosis, interventions to increase workforce participation and housing and education initiatives.

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. Published guidelines from several national and international guideline developer groups were sourced. Where Australian guidelines were being updated or newly developed, the guideline developers were contacted to review the most current drafts.

The following guideline developers groups/repositories were reviewed:

- Australian National Health and Medical Research Council (NHMRC) guidelines portal
- UK National Institute for Health and Clinical Excellence (NICE)
- New Zealand Guidelines Group (NZGG)
Clinical practice guidelines developed by non-government organisations were also reviewed. Examples included the RACGP Guidelines for preventive activities in general practice, the Central Australian Rural Practitioners’ Association manual and the Therapeutic Guidelines.

Where existing or newly developed guidelines were considered insufficient for particular topic areas, systematic reviews and meta-analyses of the primary research literature were 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 June 2005 (the date of completion of evidence reviews for the first edition) to December 2011. 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 Health Infonet, evidence reviews from the British Medical Journal’s Clinical Evidence and Dynamed, and the USA Centers for Disease Control.

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 (see below) and record the relevant references (see below). To update chapters from the first edition authors were provided with documents outlining the evidence base used for the relevant chapter draft. 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 covered in the first edition, authors conducted reviews of national and international guidelines and the empirical literature via the process described above.

The RACGP Guidelines for preventive activities in general practice format for providing recommendations was adapted to incorporate the five prevention categories used to guide the scope of interventions. It was assumed that the populations of interest for all recommendations in the National Guide are Aboriginal and Torres Strait Islander people. Although a recommendation may have been equally applicable to other populations, this was considered outside the scope of this project. A reporting template was used to guide authors in the format of the recommendations. An example follows.

<table>
<thead>
<tr>
<th>Topic: Smoking prevention and cessation</th>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening</td>
<td>People aged ≥10 years</td>
<td>Smoking status should be assessed for every patient over 10 years of age on a regular basis</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IA</td>
<td>9,20–22</td>
<td></td>
</tr>
</tbody>
</table>
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, NZGGG. For other guidelines, authors were recommended to use the AGREE critical appraisal tool to assess for guideline quality.\textsuperscript{15} For systematic reviews and randomised controlled trials the SIGN appraisal tools were recommended.\textsuperscript{24,25}

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 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 (\textit{Table 1}) and strength (\textit{Table 2}).\textsuperscript{26} For some 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 (see generalisability above). Expert opinion based recommendations were assigned as good practice points (GPP). In determining GPP, there was regular discussion between authors, the editors and, at the later stages of the project, the project reference group 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 people than in the general population. Where needed the project reference group was also consulted to assist writers by taking a consensus approach to recommendations.
NHMRC levels of evidence and grades for recommendations

These are derived from the NHMRC Levels of evidence and grades for recommendations for developers of guidelines (2009).²⁶

<table>
<thead>
<tr>
<th>Table 1. Level of evidence hierarchy</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td>III–1</td>
</tr>
<tr>
<td>III–2</td>
</tr>
<tr>
<td>III–3</td>
</tr>
<tr>
<td>IV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2. Body of evidence matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>Evidence base*</td>
</tr>
<tr>
<td>Consistency†</td>
</tr>
<tr>
<td>Clinical impact</td>
</tr>
<tr>
<td>Generalisability</td>
</tr>
<tr>
<td>Applicability</td>
</tr>
</tbody>
</table>

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 editor, who reviewed and provided feedback for suggested revisions. Several chapters, including those authored by the clinical editor, were also reviewed by the public health medical officer from NACCHO. Following this a three-member editorial team comprising the clinical editor, the NACCHO public health medical officer and the medical advisor to the RACGP Faculty of Aboriginal and Torres Strait Islander Health held several meetings, each of two days duration, 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 good practice points 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. Members of the project reference group and 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. The contributing authors, external reviewers and external peak body organisations invited to comment are listed in the acknowledgements.

Role of the funding source and conflicts of interest

The revision and updating of the National Guide is a joint project of the NACCHO and the RACGP National Faculty of Aboriginal and Torres Strait Islander Health. A grant from the Australian Government Department of Health and Ageing was provided to the RACGP, to assist in the development of the content and to assist with the editing and dissemination process. The funding body for this project had no involvement in the conception and design of the National Guide, and development of the content. Australian Government departmental representatives were invited to appraise drafts and make recommendations to NACCHO and the RACGP for improvements and the decision to act on these recommendations was independently made by the editorial team. 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 organisations were not funded and the generosity of their contribution is greatly appreciated.
What’s new in the second edition?

The format of the second edition of the National Guide has been significantly revised to give some structure to the different types of preventive activities delivered by primary healthcare providers. All the evidence underpinning the recommendations is included in the preamble to the recommendations, which is available at www.racgp.org.au/aboriginalhealth/nationalguide.

The format of the National Guide is now also better aligned with the RACGP red book. The guide aims to complement the 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), health professionals are encouraged to cross reference with the red book, which is available on the RACGP website at www.racgp.org.au/guidelines/redbook.

<table>
<thead>
<tr>
<th>New chapters</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gambling</td>
<td>Recommends interventions to prevent gambling related harms: the identification and management of problem gambling and gambling prevention strategies including community activities</td>
</tr>
<tr>
<td>The health of young people</td>
<td>Focuses on three key preventive health issues for young people: psychosocial assessment, unplanned pregnancy and illicit drug use</td>
</tr>
<tr>
<td>Rheumatic heart disease</td>
<td>Provides recommendations for all people in addition to those with a history of acute rheumatic fever/rheumatic heart disease and communities where Group A streptococcal infections are common and acute rheumatic fever is prevalent</td>
</tr>
<tr>
<td>Antenatal care</td>
<td>Focuses on five key preventive health issues for pregnant women: general assessment at the first antenatal visit, smoking cessation, alcohol consumption, genitourinary and bloodborne virus infections and nutritional assessment and supplementation</td>
</tr>
<tr>
<td>Mental health</td>
<td>Focuses on screening for depression and suicide prevention</td>
</tr>
<tr>
<td>Preventive health for the elderly</td>
<td>Focuses on three key preventive health issues for elderly people: osteoporosis, falls and dementia</td>
</tr>
</tbody>
</table>
### Key changes to existing chapters

<table>
<thead>
<tr>
<th>Topic</th>
<th>Key changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>New recommendations include assessing smoking status regularly, assessing level of nicotine dependence and implementing a system to identify all smokers and document tobacco use</td>
</tr>
<tr>
<td>Overweight/obesity</td>
<td>New behavioural recommendations for overweight/obese people including assessing the risk/benefit of orlistat and bariatric surgery, and the need to advocate for community based interventions to increase access to healthy food</td>
</tr>
<tr>
<td>Physical activity</td>
<td>New behavioural recommendations for people that are insufficiently active, have diabetes and/or cardiovascular disease. Levels of physical activity align with the Australian National Physical Activity Guidelines 2010</td>
</tr>
<tr>
<td>Alcohol</td>
<td>New recommendations include screening for hazardous drinking in high risk groups, considering screening for people 10–14 years and advising women to limit their alcohol intake to no more than 2 standard drinks/day if they choose to drink while breastfeeding. Health professionals to promote community-led strategies to reduce alcohol supply</td>
</tr>
<tr>
<td>Child health</td>
<td>Includes a significant number of key changes under immunisation, anaemia, growth failure and childhood kidney disease</td>
</tr>
<tr>
<td>Dental health</td>
<td>New recommendations include non-dental professionals undertaking oral health reviews in addition to regular dental health professional reviews, application of fluoride varnish for 0–5 year olds, and antibiotic prophylaxis prior to dental procedures for people at high risk of endocarditis. Health professionals to advocate for fluoridation of the community water supply</td>
</tr>
<tr>
<td>Eye health</td>
<td>New recommendations for eye examinations and visual acuity assessments throughout the lifecycle as well as specialised assessments for people with cataracts or diabetes. Advice for smokers and reducing ocular exposure to UV-B light to reduce cataracts. New trachoma and trichiasis recommendations for those in trachoma endemic areas include community screening programs, eye examinations for adults &gt;40 years and prevention and control strategies. Assessing housing situations for overcrowding and providing support is also relevant for people outside of trachoma endemic areas</td>
</tr>
<tr>
<td>Hearing loss</td>
<td>New recommendations include various vaccinations for children aged &lt;15 years and pregnant women, providing hearing screening throughout the lifecycle, and new behavioural, chemoprophylaxis and environmental recommendations</td>
</tr>
<tr>
<td>Sexual health and bloodborne viruses</td>
<td>Adds general prevention advice that includes behavioural and environmental recommendations and screening for chlamydia, gonorrhoea, trichomonas vaginalis, syphilis and hepatitis B. Updated immunisation advice has been included for hepatitis B, human papilloma virus, hepatitis A, hepatitis C and human immunodeficiency virus</td>
</tr>
</tbody>
</table>
### Respiratory health
This chapter focuses on five key preventive respiratory health issues: pneumococcal disease, influenza, asthma, chronic obstructive pulmonary disease (COPD), bronchiectasis and suppurative lung disease. Asthma, bronchiectasis and suppurative lung disease are new topics.

- New recommendations for influenza prevention, encouraging good hygiene practice and minimising exposure risk for healthcare workers. Other changes include consideration of chemoprophylaxis for people at high risk of influenza complications and community based strategies to improve vaccination uptake.
- New recommendations for pneumococcal disease prevention include promotion of strategies to improve pneumococcal vaccination uptake such as reminder/recall systems and community awareness.
- New recommendations for COPD include offering vaccination, screening for symptoms of COPD, discussing smoking cessation and minimising other risk factors for COPD and pharmacotherapy to improve quality of life.

### Cardiovascular disease
This chapter focuses on recommendations to determine the absolute risk for cardiovascular disease (CVD) based on multiple risk factor assessment for people without an established diagnosis of cardiovascular disease. Framingham, non-Framingham risk factors and clinically high risk conditions are presented as well as recommendations for chemoprophylaxis. Recommendations for those with an established diagnosis of CVD are also presented. The Australian cardiovascular risk charts are given in Appendix 1.

### Chronic kidney disease
New recommendations include screening for chronic kidney disease (CKD) risk factors for those without risk, screening for CKD with eGFR and urinary albumin-creatinine ratio for those with a risk factor, and supporting population-based strategies to reduce scabies and pyoderma among children. Numerous behavioural and chemoprophylaxis recommendations have also been included.

### Diabetes prevention
New recommendations include screening for diabetes from >18 years of age in regions with high diabetes prevalence and/or with high risk conditions, but consider an AUSDRISK assessment only in populations with low prevalence. Behavioural recommendations focus on diet, physical activity and breastfeeding. Pharmacotherapy is discussed for people with a high risk condition and advocacy for community based interventions are recommended.

### Cancer
Focuses on five areas for prevention and early detection of cancer: cervical, breast, liver, prostate and bowel cancer. Liver, prostate and bowel cancer are new topics.

- New recommendations for cervical cancer include promoting human papilloma virus (HPV) vaccination and commencing Pap screening regardless of HPV vaccination status. Other recommendations include assessing smoking status and offering a sexual health review.
- New recommendations for breast cancer include discussing familial breast cancer and breast awareness, while mammographic screening differs depending on age and level of risk. New behavioural recommendations cover physical activity, diet, alcohol consumption, smoking and breastfeeding. Hormone replacement therapy and other pharmacotherapy are discussed.
**References**

3. Office for Aboriginal and Torres Strait Islander Health, Aboriginal and Torres Strait Islander Health Performance Framework. Canberra: Department of Health and Ageing, 2010.
5. The RACGP National Faculty of Aboriginal and Torres Strait Islander Health. Identification of Aboriginal and Torres Strait Islander people in Australian general practice. South Melbourne: The RACGP, 2011.
6. Close the Gap is ‘a commitment made in 2008 by all Australian governments to work towards a better future for Aboriginal and Torres Strait Islander people under the National Indigenous Reform Agreement of the Council of Australian Governments (COAG). It aims to close the gap of Aboriginal and Torres Strait Islander disadvantage in areas such as health, housing, education and employment’. See www.health.gov.au/tackling-chronic-disease.
Chapter 1

Lifestyle

Smoking
Author Penny Abbott
Expert reviewers Rowena Ivers, David Thomas

Overweight/obesity
Author David Peiris
Expert reviewer Elizabeth Denney-Wilson

Physical activity
Author David Peiris
Expert reviewer Ben Ewald

Alcohol
Author Penny Abbott
Expert reviewer Kate Conigrave

Gambling
Author Penny Abbott
Expert reviewer Malcolm Battersby
Overview

This section provides recommendations for interventions to improve health outcomes related to tobacco smoking, overweight/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 originally proposed are outlined in Table 1.1.1

Table 1.1. The 5As model for behavioural and other interventions related to lifestyle risk factors

<table>
<thead>
<tr>
<th><strong>Assess</strong></th>
<th>Ask about/assess behavioural health risk(s) and factors affecting choice of behaviour change goals/methods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advise</strong></td>
<td>Give clear, specific, and personalised behaviour change advice, including information about personal health harms and benefits. It recognises that the health practitioner can be a catalyst for action and can enhance motivation for change</td>
</tr>
<tr>
<td><strong>Agree</strong></td>
<td>Collaboratively select appropriate treatment goals and methods based on the patient’s interest in and willingness to change the behaviour. This involves joint consideration of treatment options, consequences and patient preferences and setting management goals</td>
</tr>
<tr>
<td><strong>Assist</strong></td>
<td>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)</td>
</tr>
<tr>
<td><strong>Arrange</strong></td>
<td>Schedule follow up contacts (in person or by 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 4As</td>
</tr>
</tbody>
</table>

*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 Healthcare and used by the US Public Health Service to report on the effectiveness of interventions to support tobacco cessation.3 It has since been adapted for use with broader preventive health interventions that are administered in a clinical setting.1,4 The model is well informed by systematic reviews of the evidence on behavioural interventions and is recognised as an effective mechanism for translating evidence into practice. It has demonstrated widespread utility in Australia and internationally.5,6
Smoking

Background

Aboriginal and Torres Strait Islander people over the age of 15 years are twice as likely to smoke as their non-Indigenous counterparts, with 45% self reporting as current daily tobacco smokers in 2008. Sixty-eight percent of Aboriginal and Torres Strait Islander children aged 0–14 years live with a smoker. With such high prevalence rates, the use of tobacco is a major preventable cause of premature mortality and morbidity among Aboriginal and Torres Strait Islander people. Factors contributing to these high smoking rates include past government policies where tobacco was included in rations and in lieu of pay, socioeconomic disadvantage, high levels of community acceptance of smoking and lack of access to adequately resourced tobacco control interventions.

Those at higher risk of developing smoking related complications include those with diabetes and other cardiovascular risk factors, pregnant women, those with a mental illness and those with other chemical dependencies. Tobacco smoking was calculated to be responsible for one-fifth of the total deaths of Aboriginal and Torres Strait Islander people in 2003, with particularly high mortality rates due to ischaemic heart disease, chronic obstructive pulmonary disease and lung cancer. Smoking in pregnancy is linked to poorer perinatal and child health. Exposure to environmental tobacco smoke is also a significant cause of mortality and morbidity and children are particularly sensitive to its effects.

Tobacco dependence can be related to marijuana use. Young people can initially become dependent on tobacco from mixing it with cannabis. Cannabis addiction may complicate efforts to quit smoking tobacco. (See Chapter 3: The health of young people.)

Smokeless tobacco, including native tobaccos such as pituri, has been a historic form of nicotine delivery in Aboriginal and Torres Strait Islander communities. The tobaccos are chewed or pasted inside the mouth. There has been little research into the modern day use or effects of smokeless tobacco in Aboriginal and Torres Strait Islander communities, though this is still practised, particularly in central Australia.

Interventions

Health practitioners play a vital role in the prevention of smoking and the reduction of adverse health effects from smoking. All smokers should be advised to stop smoking and all interested smokers should be offered support to do so. General practitioners are advised to incorporate risk factor assessment and preventive health interventions within normal consultations whenever possible and at least annually. Such interventions are likely to involve management of multiple risk factors including smoking. There is strong evidence for the effectiveness of brief advice, brief interventions, cessation counselling, proactive quitlines and pharmacotherapy in increasing quit rates in general populations. Although there are relatively few interventions assessing the effectiveness of these interventions for Aboriginal and Torres Strait Islander people, there is no evidence to suggest these interventions are any less effective.
Brief advice to quit has a small but significant effect on cessation rates. Assuming an unassisted quit rate of 2–3%, brief advice can increase quitting by a further 1–3%. Brief advice to stop smoking, which can be done in as little as 30 seconds, probably works mainly by motivating a quit attempt and seems to have its greatest effect in less dependent smokers. More effective than brief advice alone is a ‘brief intervention’ delivered by a health professional, which typically lasts 5–10 minutes. There are many frameworks for the structure of brief interventions, including the commonly recommended 5As: ask, assess, advise, assist, arrange (see the introduction to this chapter). Typical brief intervention activities include screening, providing brief advice, counselling techniques such as motivational interviewing, and recommending specialist support and/or pharmacotherapy as required. There is a dose-response effect to these intervention activities: the longer the duration of the person-to-person intervention the more effective it is. 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 multisession support (preferably four or more sessions) are important. Relapse prevention advice for quitters in the first year after smoking cessation is recommended; however there is insufficient evidence to recommend any specific relapse prevention interventions.

Assessment of readiness to quit assists in planning treatment, and tailoring interventions according to whether the patient is willing or unwilling to quit is helpful. Traditionally patients have been classified into the following stages of readiness to quit: pre-contemplation, contemplation, preparation, action and maintenance. However, there is no evidence the stages of change model is any more useful in smoking cessation than any other approach and should not limit health professionals from using interventions such as motivational interviewing for people who profess unwillingness to quit. Smoking cessation advice should be sensitive to the patient’s preferences, needs and circumstances. Factors consistently associated with higher abstinence rates are high motivation, readiness to quit, moderate to high self efficacy, supportive social networks and lower nicotine dependence. The Fagerström test for nicotine dependence is a validated measure for assessing nicotine dependence and may be useful in predicting relapse to smoking and guide a clinician on the intervention needed (see Resources).

Flexible and culturally targeted modes of delivery of smoking cessation interventions are likely to be important to, and improve their effectiveness for, Aboriginal and Torres Strait Islander people. The effect of training health professionals to give cessation advice appears to be modest in reducing smoking rates on an individual basis but on a population health level it is effective. Treatment delivered by a range of health professionals increases tobacco cessation rates. At the health service level, instituting a practice system designed to identify and document tobacco use, such as a clinic screening systems and the use of computer prompts, almost doubles the rate of health professional intervention and results in higher rates of cessation.

Referral to quitlines should be strongly considered for all smokers. There is conflicting evidence of their effectiveness in Indigenous or minority communities; however quitlines have been shown to be effective in many populations worldwide and are likely to be beneficial for Aboriginal and Torres Strait Islander people.
Self help materials are defined as resources provided to an individual unaccompanied by any intervention provided by a health practitioner. They may be written, internet based or other media. Self help resources appear to have a small effect in increasing quit rates compared to no intervention. There is no current evidence that they have an additional benefit when used alongside other interventions such as advice from a healthcare professional or nicotine replacement therapy (NRT). Tailoring of materials increases their benefit. Aboriginal and Torres Strait Islander people are likely to prefer resources that are targeted and relevant to their community.

Pharmacotherapies increase the effectiveness of smoking cessation counselling and should be offered to all smokers who wish to quit, except those in whom there are medical contraindications or insufficient evidence of effectiveness, such as pregnant women, light smokers and adolescents. Nicotine replacement therapy doubles the rate of successful quit attempts. Bupropion and varenicline triple the rate of success, but have a greater side effect profile than NRT. Varenicline and bupropion are not recommended for use in pregnancy; NRT can be considered during pregnancy after discussion of the risks and benefits.

Smoking cessation counselling has been shown to be effective for adolescents, but there is a lack of clear evidence as to the specific interventions of most use in this group. It is recommended that interventions that are known to be effective in adults are also offered to adolescents. There is still a lack of evidence as to the effectiveness of school education programs in reducing the uptake of smoking. There are several as yet unevaluated school education programs that have been developed for Aboriginal and Torres Strait Islander children and adolescents. Computer and internet cessation programs are potential vehicles for smoking cessation programs for young people. Multicomponent community interventions appear to have some effect in reducing uptake of tobacco use in young people. Mass media campaigns can prevent the uptake of smoking by young people and work best when combined with broader tobacco control measures such as restricting adolescents’ access to tobacco.

Environmental tobacco smoke (ETS), or secondhand smoke, causes asthma, ischaemic heart disease, COPD and lung cancer in non-smokers and is linked to multiple other diseases. Children are particularly susceptible to ETS, of particular importance given the high rates of ETS exposure for Aboriginal and Torres Strait Islander children both in utero and after birth. Intensive efforts to reduce children’s exposure to secondhand smoke are required and may include parental education and legislative initiatives.

Public health initiatives are important in reducing smoking prevalence. Broad initiatives, such as raising standards of living and improving educational and employment opportunities, are critical to reducing smoking and the harm it causes for Aboriginal and Torres Strait Islander people. Multicomponent smoking cessation interventions are likely to increase abstinence rates and should be encouraged. This includes key public health initiatives such as price increases and taxation, restricting tobacco industry marketing, smokefree regulations (smoking bans), particularly in workplaces, and mass media campaigns.
## Recommendations: Primary prevention

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>People aged ≥10 years</td>
<td>Smoking status should be assessed for every patient over 10 years of age on a regular basis</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IA</td>
<td>20,21,26,43</td>
</tr>
<tr>
<td></td>
<td><strong>Current smokers</strong></td>
<td>A system for identifying all smokers and documenting tobacco use should be used in every health service</td>
<td>As part of a systematic health service approach</td>
<td>IIB</td>
<td>14,26</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Assess the level of nicotine dependence to help predict relapse to smoking and guide intervention choice (eg. Fagerström test: see Resources)</strong></td>
<td>Opportunistic</td>
<td>GPP</td>
<td>22,23,44</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>Non-smokers</td>
<td>Advise non-smokers to limit their exposure to tobacco smoke, especially parents of babies, young children and pregnant women Parents who smoke should be counselled not to smoke in the house or in a confined space such as a motor vehicle</td>
<td>Opportunistic</td>
<td>IIIC</td>
<td>14,16,21,26,36,45</td>
</tr>
</tbody>
</table>
### Recommendations: Interventions for smokers

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavioural</strong></td>
<td>Current smokers</td>
<td>All patients who smoke, regardless of the amount they smoke and whether they express a desire to smoke or not, should be offered brief cessation advice at every visit (consider using the 5As framework – see Chapter 1: Lifestyle, introduction)</td>
<td>Opportunistic at every visit and as part of an annual health assessment</td>
<td>IA</td>
<td>14,20,21,26,43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brief interventions should be adapted to local cultural setting (see Resources: SmokeCheck)</td>
<td>N/A</td>
<td>GPP</td>
<td>12,13,21,25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoking cessation counselling should be offered to all people at every opportunity, and if possible, should comprise at least four face-to-face or group support sessions</td>
<td>Opportunistic</td>
<td>IA</td>
<td>20,26,46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consider referral to a proactive smoking cessation telephone service such as a quitline, particularly for people with limited access to face-to-face counselling</td>
<td>Opportunistic</td>
<td>IIA</td>
<td>10,12,20,21,23,26,30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make available tailored self help quit smoking materials, both print and electronic</td>
<td>Opportunistic</td>
<td>IB</td>
<td>16,20,26,32,46</td>
</tr>
<tr>
<td></td>
<td>People who have stopped smoking in the past year</td>
<td>Offer follow up visits for smokers attempting to quit</td>
<td>Within 1 week of quitting Then within 1 month of abstinence Then opportunistic for at least 1 year</td>
<td>IIC</td>
<td>14,20,26,27,47</td>
</tr>
<tr>
<td></td>
<td>Pregnant women who are current smokers</td>
<td>Offer intensive smoking cessation counselling (see Chapter 9: Antenatal care, for detailed recommendations)</td>
<td></td>
<td>IA–IIIC</td>
<td>16,21,43,48,49</td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>Current smokers</td>
<td>Recommend smoking cessation pharmacotherapies to patients interested in quitting. First line treatments are NRT, bupropion and varenicline Pregnant women may be offered NRT if the benefits outweigh the risks (see Chapter 9: Antenatal care)</td>
<td>Opportunistic</td>
<td>IA</td>
<td>20,26,30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GPP</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td>Complement the above individual based strategies with a community based approach to tobacco control (eg. promotion of smoke free workplaces)</td>
<td></td>
<td>IIIIC</td>
<td>10,50,51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Promote training of Aboriginal and Torres Strait Islander health workers in brief interventions for smoking cessation to increase quit rates</td>
<td>N/A</td>
<td>GPP</td>
<td>10,12</td>
</tr>
</tbody>
</table>
Resources

Educational and quitting resources (Centre for Excellence in Indigenous Tobacco Control)
www.ceitc.org.au

Tobacco in Australia: a comprehensive review of the major issues in smoking and health in Australia (Cancer Council Victoria)
www.tobaccoinaustralia.org.au

Fagerström nicotine dependency test

Detailed information on tobacco resources, publications, programs and projects (Australian Indigenous HealthInfoNet)
www.healthinfonet.ecu.edu.au/health-risks/tobacco

Brief intervention and self help resources to promote smoking cessation for Aboriginal people (SmokeCheck)

Medicines to help Aboriginal and Torres Strait Islander people stop smoking: a guide for health workers
Email IndigenousTobacco@health.gov.au for a copy

Medicines to help you stop smoking: a guide for smokers
Email IndigenousTobacco@health.gov.au for a copy

Supporting smoking cessation: a guide for health professionals (RACGP)
www.racgp.org.au/guidelines/smokingcessation

National Tobacco Campaign including ‘Break the Chain’ campaign for Aboriginal and Torres Strait Islander people and Quitline (proactive telephone support) information and referral forms (Australian Government)

Closing the Gap clearinghouse (AIHW)

Quitting resources (NSW Health)

Internet smoking cessation programs and resources

National youth smoking website
www.OxyGen.org.au

Quitcoach
Overweight/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. It is associated with other cardiovascular risk factors including insulin resistance, blood pressure elevation, elevated triglycerides and reduced high density lipoprotein (HDL) cholesterol levels.

Body mass index (BMI) is an approximate measure of total body fat represented by weight/(height in metres) squared. BMI is the recommended measure for classifying overweight (BMI >25 kg/m² for adults and >85th centile for children aged 2–18 years) and obesity (BMI >30 kg/m² for adults and >90th centile for children aged 2–18 years). 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 people. While there are presently no adjusted thresholds validated for Aboriginal and Torres Strait Islander people, a BMI of 22 kg/m² for overweight adults has been proposed as a more accurate representation of risk, particularly in remote populations.

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. Waist circumference may be easier to measure by the patients themselves and thus an appropriate alternative measure for self assessment and monitoring (see Resources). World Health Organization guidelines provide thresholds that combine BMI and waist circumference to assess disease risk of type 2 diabetes, elevated blood pressure and cardiovascular disease. These are shown in Table 1.2.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Body mass index (kg/m²)</th>
<th>Disease risk (relative to normal measures)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Waist circumference</td>
</tr>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>–</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>18.5–24.9</td>
<td>–</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0–29.9</td>
<td>Increased</td>
</tr>
<tr>
<td>Obesity</td>
<td>30.0–39.9</td>
<td>High to very high</td>
</tr>
<tr>
<td>Severe obesity</td>
<td>&gt;40</td>
<td>Extremely high</td>
</tr>
</tbody>
</table>

* Risk of type 2 diabetes, elevated blood pressure and cardiovascular disease

Source: NHMRC 2003a
The 2004–05 National Aboriginal and Torres Strait Islander Health Survey is the most recent comprehensive survey of dietary activity and overweight/obesity. It found Aboriginal and Torres Strait Islander males and females were 1.5 and 2 times more likely respectively to be obese than non-Indigenous males and females. 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.

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. In both urban and remote areas food access is affected by low income and inadequate transport, overcrowding, poor housing and inadequate cooking and food storage facilities are additional environmental factors. Community store and takeaway food is often nutritionally poor and apart from traditional food sources is the principal source of food in many areas. Even if nutritious, less energy dense food is available it is disproportionately more expensive than energy dense food and therefore less accessible to people on low incomes.

Counselling to promote healthy eating 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. A combination of advice on diet and exercise is more effective than advice on either diet or exercise alone. A low energy diet is the most effective intervention for weight loss.

The Australian Dietary Guidelines for adults are highlighted in Table 1.3. Two recommendations that may be more relevant to some Aboriginal and Torres Strait Islander communities are also included.

<table>
<thead>
<tr>
<th>Table 1.3. Dietary guidelines for Australian adults*</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enjoy a wide variety of nutritious foods</td>
</tr>
<tr>
<td>• Eat plenty of vegetables, legumes and fruits</td>
</tr>
<tr>
<td>• Eat plenty of cereals (including breads, rice, pasta and noodles), preferably wholegrain</td>
</tr>
<tr>
<td>• Include lean meat, fish, poultry and/or alternatives</td>
</tr>
<tr>
<td>• Include milks, yoghurts, cheeses and/or alternatives. Reduced-fat varieties should be chosen, where possible</td>
</tr>
<tr>
<td>• Drink plenty of water</td>
</tr>
<tr>
<td>• Choose store foods that are most like traditional bush foods*</td>
</tr>
<tr>
<td>• Enjoy traditional bush foods whenever possible*</td>
</tr>
<tr>
<td>• And take care to:</td>
</tr>
<tr>
<td>– limit saturated fat and moderate total fat intake</td>
</tr>
<tr>
<td>– choose foods low in salt</td>
</tr>
<tr>
<td>– limit your alcohol intake if you choose to drink</td>
</tr>
<tr>
<td>– consume only moderate amounts of sugars and foods containing added sugars</td>
</tr>
</tbody>
</table>

Source: NHMRC 2003b

* Recommendations specific to some Aboriginal and Torres Strait Islander communities
Cognitive focused behavioural interventions include situational control and stimulus control avoiding cues, 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.\textsuperscript{58}

Orlistat is the most effective agent in the treatment of obesity and 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.\textsuperscript{58,66} Orlistat in combination with behavioural interventions can lead to greater weight loss than behavioural interventions alone.\textsuperscript{66} 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. The risks and benefits should therefore be thoroughly discussed before considering adding Orlistat to behavioural interventions.

There has been one systematic review which has found that bariatric surgery, mainly in people with a BMI $\geq$35 kg/m$^2$, is an effective weight loss intervention.\textsuperscript{58,67} Bariatric surgery encompasses a range of procedures that are either restrictive (eg. laparoscopic banding, sleeve gastrectomy), malabsorptive (eg. bilio-pancreatic diversion) or a combination of the two. It has also been shown to reduce all-cause mortality and have a number of other clinically significant health outcomes (eg. improved cardiovascular risk, glycaemic control and renal function). The degree of weight loss is influenced by the type of surgery that is performed, with malabsorptive procedures tending to produce the greatest weight loss. One large cohort study found that surgery is associated with some harms (wound complications, bleeding, thromboembolism, pulmonary complications)\textsuperscript{68} and so the decision to recommend surgery should be balanced against these harms.

There are few robust evaluations of health promotion strategies to prevent overweight/obesity in Aboriginal and Torres Strait Islander communities. 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 reducing social isolation. Interventions that employ a peer-to-peer education model are likely to be more effective in enhancing food security.

One reason for the limited success of prevention programs is the failure to incorporate an intersectoral approach. 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:

- Food supply in remote and rural communities
- Food security and socioeconomic status
- Family focused nutrition promotion
- Nutrition issues in urban areas
- The environment and household infrastructure
- Aboriginal and household nutrition workforce
- National food and nutrition information systems.
More recently the National Preventative Health Strategy has stressed that multicomponent, community based programs are critical to reducing the obesity related disease burden experienced by Aboriginal and Torres Strait Islander people. A number of environmental 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.

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 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.

<table>
<thead>
<tr>
<th>Recommendations: Overweight/obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventive intervention type</td>
</tr>
<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td>Screening</td>
</tr>
</tbody>
</table>
|                                    | All people aged ≥18 years     | Assess BMI and waist circumference (see Table 1.2) Groups associated with improved outcomes from BMI/waist circumference monitoring include:  
\* individuals seeking advice on weight management  
\* those with conditions associated with overweight/obesity (CVD, diabetes, stroke, gout, liver or gallbladder disease) | Opportunistic and as part of an annual health assessment | GPP 58, 1B 58 |
| Behavioural                        | All people aged ≥18 years     | Provide brief advice to promote healthy eating and physical activity as per Australian guidelines (see Table 1.1 and Chapter 1: Physical activity) | Opportunistic              | GPP                         |
|                                    | Adults with overweight/obesity | Develop a weight management plan that must include:  
\* targeted information as per Australian dietary guidelines (see Table 1.3)  
\* goal setting  
\* at least one follow up consultation | Opportunistic and as part of an annual health assessment | IB 58, 65, 71 |

Encourage regular self weighing
<table>
<thead>
<tr>
<th>Lifestyle</th>
<th>Encourage a net energy deficit through combined dietary and physical activity interventions as per Australian dietary and physical activity guidelines</th>
<th>IB 58,72</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider referral to specialist services, dietitian and/or exercise physiologist if available</td>
<td>GPP</td>
<td></td>
</tr>
<tr>
<td>Individual or group based psychological interventions* are recommended in combination with dietary and physical activity advice</td>
<td>IA 58,66</td>
<td></td>
</tr>
<tr>
<td>Children with overweight/obesity</td>
<td>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</td>
<td>Opportunistic and as part of an annual health assessment</td>
</tr>
<tr>
<td>Except in severe obesity, weight maintenance rather than weight loss is recommended for healthy growth and development</td>
<td>IB 58</td>
<td></td>
</tr>
<tr>
<td>Recommend referral for specialist review for children with severe obesity</td>
<td>IVD 58</td>
<td></td>
</tr>
<tr>
<td>Chemoprophylaxis</td>
<td>People aged ≥18 years with one or more weight related comorbidities present (severe mobility restriction, arthritis, type 2 diabetes) and a BMI ≥28 kg/m²</td>
<td>Opportunistic and as part of an annual health assessment</td>
</tr>
<tr>
<td>Assess risk/benefit of orlistat on an individual basis in conjunction with lifestyle interventions</td>
<td>IA 58,66</td>
<td></td>
</tr>
<tr>
<td>Surgical</td>
<td>People aged ≥18 years with one or more weight related comorbidities present (as above) and a BMI ≥35 kg/m²</td>
<td>Opportunistic</td>
</tr>
<tr>
<td>Assess risk/benefit of bariatric surgery on an individual basis in conjunction with lifestyle interventions</td>
<td>IIC 58,67</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>Communities</td>
<td>N/A</td>
</tr>
<tr>
<td>Advocate for multifactorial and coordinated community based interventions to increase access to healthy and nutritious food (eg. subsidised healthy food in stores)</td>
<td>GPP 69,70</td>
<td></td>
</tr>
</tbody>
</table>

* Cognitive focused behavioural interventions include: situational control and stimulus control, avoiding cues to overeating, cognitive reframing and reinforcement techniques, self recording of calorie intake and eating behaviours, goal setting and relapse prevention strategies.
Resources
Growth charts (Centers for Disease Control and Prevention)
www.cdc.gov/growthcharts/cdc_charts.htm

BMI charts (WHO)
children 5–19 years
children under 5 years
www.who.int/childgrowth/standards/bmi_for_age/en/index.html

Helpful tips for measuring waist circumference (Australian Government)
Physical activity

Background
Physical activity is any bodily movement produced by skeletal muscles that results in energy expenditure. 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. 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 5 days a week) compared with no activity is associated with a reduction in mortality risk of 19%, while 7 hours per week of moderate activity compared with no activity reduces mortality risk by 24%. 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.

By contrast with most other risk factors, physical inactivity is equally and highly prevalent among Aboriginal and Torres Strait Islander people when compared with non-Indigenous people. Based on 2004–05 National Health Survey and National Aboriginal and Torres Strait Islander Health Survey data, no exercise or low levels of exercise was reported by 75% of those aged 15 years and over in the 2 weeks prior to interview.

Interventions
There is evidence that interventions to increase physical activity can lead to significant risk reductions in vascular disease and diabetes. Further, a health benefit accrues to people who increase their physical activity levels, even in the absence of weight reduction. Secondary prevention interventions for people with diabetes and both postacute and stable CVD are also effective. Targeted interventions involving professional guidance and continued support can lead to moderate short and midterm increases in self reported physical activity, achievement of a predetermined level of physical activity and improved cardiorespiratory fitness.

The specific components of successful interventions are difficult to discern owing to large heterogeneity in the types of interventions previously studied. When translating clinical trial based interventions into real world settings there appears to be a substantial reduction in the effectiveness of those interventions. A World Health Organization 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:

- 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
- support with targeted information
- linked 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)
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.\textsuperscript{88} Long term effects are not known.

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.\textsuperscript{86,87} 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.\textsuperscript{89} Health promotion strategies in the school and workplace are also effective in increasing physical activity,\textsuperscript{86,87} but have not been well studied in Aboriginal and Torres Strait Islander community settings.

* Moderate physical activity is activity at a level that causes your heart to beat faster and some shortness of breath, but you can still talk comfortably. Vigorous physical activity is activity at a level that causes your heart to beat a lot faster and shortness of breath, which makes talking difficult between deep breaths (i.e. physical activity at a heart rate of 70–85\% of maximum heart rate [MHR]). MHR is calculated as 220 minus age.
Table 1.4. Australian physical activity guidelines: Recommendations by age group

<table>
<thead>
<tr>
<th>Age group</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 2 years</td>
<td>For children under 1 year supervised floor based play in safe environments should be encouraged from birth&lt;br&gt;For children under 2 years no time watching television or using other electronic media</td>
</tr>
<tr>
<td>2–5 years</td>
<td>Toddlers and preschoolers should be physically active every day for at least 3 hours, spread throughout the day&lt;br&gt;Watching television and the use of other electronic media (DVDs, computer and other electronic games) should be limited to less than 1 hour per day</td>
</tr>
<tr>
<td>5–12 years</td>
<td>At least 60 minutes (and up to several hours) of moderate to vigorous physical activity every day&lt;br&gt;No more than 2 hours per day using electronic media for entertainment (eg. computer games, TV, internet), particularly during daylight hours</td>
</tr>
<tr>
<td>12–18 years</td>
<td>At least 60 minutes of moderate to vigorous physical activity every day&lt;br&gt;No more than 2 hours per day using electronic media for entertainment (eg. computer games, TV, internet)</td>
</tr>
<tr>
<td>18–54 years</td>
<td>The following 4 steps are recommended:&lt;br&gt;• Think of movement as an opportunity, not an inconvenience&lt;br&gt;• Be active every day in as many ways as you can&lt;br&gt;• Put together at least 30 minutes of moderate physical activity on most, preferably all days. 30 minutes can be accumulated throughout the day in 10–15 minute sessions or done in one session&lt;br&gt;• If you can, also enjoy some regular vigorous activity for extra health and fitness</td>
</tr>
<tr>
<td>55 years and over</td>
<td>Older people should do some form of physical activity, no matter what their age, weight, health problems or abilities&lt;br&gt;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&lt;br&gt;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&lt;br&gt;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 the recommended amount, type and frequency of activity&lt;br&gt;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</td>
</tr>
</tbody>
</table>

Source: Department of Health and Ageing 201092
## Recommendations: Physical activity

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All people</td>
<td>Assess current level of physical activity</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IB</td>
<td>86,87,90</td>
</tr>
</tbody>
</table>
| **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 exercise goals aiming to achieve National Physical Activity Guideline recommendations (see Table 1,4)  
  - record these goals and provide patients with a written copy  
  - consider cognitive behavioural support and follow up  
  - consider additional social support (e.g. buddy system, involvement in a group activity, referral for coaching) | | |
| **People with diabetes**    | For sedentary people, a gradual introduction and initial low intensity of physical activity with slow progressions in volume and intensity is recommended  
  Those on insulin should be given individualised advice on avoiding hypoglycaemia when exercising (e.g. adjustment of carbohydrate intake, reduction of insulin dose, and choice of injection site)  
  Consider referral to an exercise physiologist for coaching if facilities are available | Opportunistic and as part of an annual diabetes assessment | GPP | 91 |
| **People with cardiovascular disease** | Those with recent acute coronary syndrome event or revascularisation surgery (CABG, PCI) should be advised to participate in a short period (up to 12 weeks) of supervised exercise rehabilitation | Opportunistic | IA | 82 |
| | Those who are well compensated and clinically stable should commence an initial low intensity of physical activity with slow progressions in volume and intensity  
  Consider referral to an exercise physiologist for coaching if facilities are available | | IIB | 82 |
| **Environmental**           | All people      | Refer to appropriate community based physical activity programs and encourage use of public facilities that promote activity (e.g. advocate for increased availability of sports and recreational facilities in remote communities) | Opportunistic and as part of an annual health assessment | IB | 88,90 |
Alcohol

Background

Any level of drinking alcohol can increase the risk of ill health and injury. Alcohol is responsible for a considerable burden of death, disease and injury in Australia. Drinking is a major factor in much of the injury resulting from road crashes and other accidents, and in social problems such as violence, family breakdown, child abuse and neglect. As such, alcohol related harm is not restricted to individual drinkers but has relevance for families, bystanders and the broader community.93 Although most surveys show that Aboriginal and Torres Strait Islander people are less likely than the general population to drink, the prevalence of harmful drinking and alcohol attributable injury and disease in the Aboriginal and Torres Strait Islander population is about twice that of the non-Indigenous population.94 The rate of alcohol attributable death among Aboriginal and Torres Strait Islander people is similarly twice that of the non-Indigenous population.95 There is a strong association between alcohol use and associated harms such as suicide and violence.96 Alcohol causes and exacerbates common mental health conditions such as anxiety, depression and insomnia.94

The current Australian guidelines for healthy men and women recommend that drinking no more than two standard drinks on any one day reduces the lifetime risk of harm from alcohol related disease or injury.93 Every drink above this level continues to increase the lifetime risk of both disease and injury; drinking less frequently over a lifetime (eg. drinking weekly rather than daily), and drinking less on each drinking occasion, reduces this risk.93 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. Not drinking is the safest option for pregnant or breastfeeding women and for children and adolescents under 18 years of age.93

There is clear evidence to support the effectiveness of primary care screening in detecting at-risk levels of alcohol consumption using quantity-frequency estimates.97 Given the late presentation of alcohol problems in many Aboriginal and Torres Strait Islander people, active screening and detection is recommended.97 The appropriate frequency of alcohol screening in Aboriginal and Torres Strait Islander settings is uncertain, with no clear evidence base to draw on. Screening can be done by a drinking history taken as part of the routine interview. Brief questionnaires are also available as an aid to systematic screening and can be incorporated into adult health assessments. The AUDIT tool, comprising 10 questions that cover level of consumption, evidence of dependence and experience of harms, is the most sensitive of the currently available screening tools (see Resources). There is high level evidence to support its use in the general population, although it has not been validated specifically in the Aboriginal and Torres Strait Islander community.97,98 A shorter version, AUDIT-Consumption (AUDIT-C), comprises the first three questions of AUDIT and may also be used for practical purposes when time is limited. These questions assess alcohol consumption, asking: ‘How often do you have a drink containing alcohol?’, ‘How many drinks containing alcohol do you have on a typical day when you are drinking?’ and ‘How often do you have six or more drinks on one occasion?’98,100 Another structured questionnaire, the Indigenous
Risk Impact Screen (IRIS), is a 13-item structured questionnaire that can be used to help in identification of alcohol and drug problems and mental health risks for Aboriginal and Torres Strait Islander people (see Resources).94,101–103

Several barriers to successful integration of these tools in Aboriginal and Torres Strait Islander settings have been identified104,105 and screening tool questions may require rephrasing to allow for cultural differences.94,102 Nevertheless it is likely they will assist in the earlier detection of alcohol problems in Aboriginal and Torres Strait Islander people.94,105 Indirect biological markers (such as liver function tests) should only be used as an adjunct to other screening measures as they have lower sensitivity and specificity in detecting people risk of alcohol related harm than structured questionnaire approaches.97

Brief interventions for problem drinking can decrease alcohol misuse and alcohol related harm.105 Brief interventions are particularly effective in non-dependent drinkers who are drinking at risky levels, but are also useful in dependent drinkers as a precursor to engaging them in more intensive treatments.99,105 These treatments include measures that can be provided by primary healthcare services, including psychosocial counselling, and where suitable, home detoxification and use of relapse prevention medications. Other drinkers may benefit from referral to specialist services.97

Positive outcomes in the management of problem and dependent drinking are likely in Aboriginal and Torres Strait Islander settings if they are delivered in a respectful and non-judgemental manner.94,104,106,107 Training is available to increase skills in providing appropriate brief intervention.94,106

Aboriginal and Torres Strait Islander people are acutely aware of the costs of alcohol and there are several examples of active community engagement in responding to alcohol misuse.9,4 This includes primary prevention activities such as school and family education programs and programs aimed at fostering self esteem and cultural connectedness in youth.94,108 Environmental strategies such as reducing access to alcohol have also been used in some communities with evidence of effect in decreasing alcohol related harm.108
### Recommendations: Alcohol

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
</table>
| **Screening**               | All people aged ≥15 years | Ask about the quantity and frequency of alcohol consumption to detect hazardous drinkers (see Table 1.5) Focus particularly on the following high risk groups:  
  • adolescents and young adults  
  • women who are pregnant or planning a pregnancy  
  • illicit drug users  
  • those with a family history of alcohol dependence  
  • people with medical conditions made worse by alcohol (chronic liver disease, hypertension, other major organ disease)  
  • people suffering from mental illness made worse by alcohol such as anxiety and depression | As part of an annual health assessment | Opportunistic | 1B | 97–99 |
|                             |                 | Consider the use of structured questionnaires such as AUDIT, AUDIT-C or IRIS to assess drinking (see Resources – these tools may require some adaptation to local community needs) | As part of an annual health assessment | 1B | 99,109 |
| People aged 10–14 years     | Consider sensitive and age appropriate alcohol intake screening in aged 10–14 years (see Chapter 3: The health of young people) Parental or carer involvement may be required and referral should be considered | As part of an annual health assessment | IIIIB | 98,109,110 |
| People with hazardous and harmful drinking levels | Review for comorbid disease and other chronic disease risk factors | As part of an annual health assessment | 1A | 97,111 |
### Recommendations: Alcohol (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Intervention</th>
<th>Opportunity</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavioural</strong></td>
<td>People with hazardous and harmful drinking levels</td>
<td>Offer brief interventions. Consider using tools such as FLAGS and 5As approach (see Table 1.1 and 1.6 and Chapter 1: Lifestyle, Introduction) Brief interventions alone are not sufficient for people with severe alcohol related problems or alcohol dependence who require referral or extended intervention. (Treatment specific guidelines should be consulted in these circumstances)</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IA 97–99</td>
</tr>
<tr>
<td>Women who are pregnant, breastfeeding, seeking pre-conception counselling</td>
<td>Advise to abstain from alcohol, emphasising the risks to the unborn child Advise breastfeeding mothers that not drinking is the safest option, especially in the first month postpartum. For those choosing to drink, alcohol intake should be limited to no more than two standard drinks per day. Continue to promote breastfeeding</td>
<td>Pregnant women: At first and subsequent antenatal visits as appropriate For all others opportunistic and as part of an annual health assessment</td>
<td>IA 93</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Promote community led strategies to reduce alcohol supply including: • advocacy for ‘dry communities’ • restrictions to liquor licensing hours • better policing of responsible service of alcohol • community development initiatives</td>
<td></td>
<td>GPP 108,112,113</td>
<td></td>
</tr>
</tbody>
</table>
### Table 1.5. National Health and Medical Research Council guidelines for safer alcohol use

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.

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.

For children and young people under 18 years of age, not drinking alcohol is the safest option:
- 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.
- for young people aged 15−17 years, the safest option is to delay the initiation of drinking for as long as possible.

Maternal alcohol consumption can harm the developing fetus or breastfed baby:
- for women who are pregnant or planning a pregnancy, not drinking is the safest option.
- for women who are breastfeeding, not drinking is the safest option.

Source: NHMRC 200993

### Table 1.6. The FLAGS framework for brief intervention

<table>
<thead>
<tr>
<th>Feedback</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listen</td>
<td>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.</td>
</tr>
<tr>
<td>Advice</td>
<td>Give clear advice about the importance of changing current drinking patterns and a recommended level of consumption. A typical 5–10 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.</td>
</tr>
<tr>
<td>Goals</td>
<td>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.</td>
</tr>
<tr>
<td>Strategies</td>
<td>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.</td>
</tr>
</tbody>
</table>

Source: Haber P, Lintzeris N, Proude E, Lopatko O 200997
Resources
Quick reference guide to the treatment of alcohol problems: companion
document to the guidelines for the treatment of alcohol problems (Australian
Government)

Guidelines for safer alcohol use (NHMRC)

AUDIT tool (Northern Territory Government)
pdf&siteID=1&str_title=Alcohol%20Screen%20(AUDIT)%20Tool.pdf

AUDIT-C tool
www.cqaimh.org/pdf/tool_auditc.pdf

IRIS tool (Queensland Government)

Talking about alcohol with Aboriginal and Torres Strait Islander patients
flipchart (the flipchart includes tear off prescription pads)
www.alcohol.gov.au

Standard drink definition and calculator
Gambling

Background
Gambling has been formally defined as ‘an entertainment based on staking money on uncertain events driven by chance’.114 Gambling disorders are often categorised in the literature into problem and pathological gambling; the latter currently medically defined as an impulse disorder. Problem gambling is more loosely defined,115 but in the Australian context the term problem gambling is generally used to refer to the full continuum of gambling related harm.116 Gambling disorders are characterised by difficulties in limiting money and/or time spent on gambling, which leads to adverse consequences for the gambler, for others, or for the community.114

Recreational gambling takes many forms, with electronic gaming machines (‘pokies’) and table games such as roulette and blackjack accounting for the bulk of expenditure. The main form of gambling in Aboriginal and Torres Strait Islander communities has traditionally been card playing. While this has been problematic for some individuals, where ‘pokies’ have become available locally they have replaced traditional forms of gambling, often with more harmful consequences.114

Gambling is a significant issue for many Aboriginal and Torres Strait Islander people, and can have serious consequences for individuals, families and communities.117–119 Aboriginal and Torres Strait Islander people are more likely to be regular and problem gamblers than non-Indigenous people and to start gambling at a younger age.117,119,120 Problems that have been reported as associated with gambling in surveys of Aboriginal and Torres Strait Islander communities include financial hardship, social and emotional difficulties, substance abuse and contact with the criminal justice system.117,118 Gambling disorders are highly associated with psychiatric comorbidities, particularly substance use disorders.115

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, including through family activities such as gifting lottery tickets and involvement in sport associated gambling.120–122 Children whose parents and/or siblings have issues with problem gambling or substance abuse are at higher risk of becoming problem gamblers.123 Adolescents who gamble are at particularly high risk for problem gambling and develop problem gambling behaviours at 2–3 times the rate of adults.120,121 There is limited information on the early identification of adolescents with gambling problems.121 Warning signs of adolescent problem gambling include multiple visits to internet gaming sites, finding instant lottery tickets, excessive interest in sports events and significant unexplained monetary outlays.122 Family cohesiveness and school connectedness may protect adolescents from problem gambling.122
Interventions

Interventions involving a broad group of stakeholders, including government, industry and community, are important to reduce harms caused by gambling.117,123,124 Public health interventions, such as safety controls for technology based gambling and prevention of access to instant lottery tickets for those under 18 years of age, may assist to reduce uptake of gambling and harms from gambling.122,125,127 There is currently little published information internationally on culturally specific prevention initiatives for problem gambling.123 Interventions are likely to be more effective if they take a broad approach to preventing gambling related harms. In Aboriginal and Torres Strait Islander communities this must include attention to the social and environmental context of gambling, and take into account individual community needs and promote whole of community health.117,119

The first Australian guideline on the prevention and treatment of problem gambling has been released, with Cochrane systematic reviews to follow.116 The goal of gambling prevention activities is to encourage responsible and non-harmful gambling activities in those who choose to gamble.123 It should be approached by health professionals in a similar way to other risk behaviours such as smoking and alcohol.122,123

Screening for problem gambling is not generally part of routine general practice in Australia, despite GPs and other primary care workers being well placed to provide early identification and intervention for problem gamblers.125,128 Primary care workers may become more confident and effective at detecting problem gambling through recognising that stress related medical disorders may be a presenting complaint of a person with underlying problem gambling and that problem gambling is commonly associated with other health problems including substance abuse and mental health disorders.125–127 Other vulnerable groups are the elderly, people with intellectual disability and people from poorer, disadvantaged communities.114

There are several tools that can be used to screen for problem gambling behaviours,115,116,125 although some are quite long and therefore, it has been argued, impractical for primary care screening.127 Validated screening measures are most likely to be useful in high risk groups such as those with mental health problems, and recently released Australian clinical guidelines have a guide to available tools.116 The EIGHT questionnaire has been used successfully in general practice settings.129 A simple question as to whether a patient is experiencing problems with their gambling may be as effective as more detailed tools and more appropriate for primary care screening.127 No screening tools have been validated for use with Aboriginal and Torres Strait Islander groups.117 Work is currently being undertaken in New South Wales to develop and test a tool for use with Aboriginal people.130

More research is needed into screening and intervention for adolescents who gamble.131 Most current research has been done in the context of school based interventions.131 Given gambling behaviours begin around 12 or 13 years of age, preventive interventions, such as school based strategies educating young people on basic principles of gambling, should begin before then.123–132 Increasing the awareness of teachers, parents and healthcare professionals in recognising adolescent gambling may assist in the identification of at risk adolescents.122
Reviews and randomised controlled trial evidence around treatment of pathological gambling provide some evidence for the effectiveness of cognitive behaviour therapy.\textsuperscript{133,134} There is a need for clear local referral pathways and training of staff in Aboriginal and Torres Strait Islander health services to improve the prevention, detection and management of problem gambling.\textsuperscript{117} Shame and stigma may prevent Aboriginal and Torres Strait Islander people from accessing help for gambling related problems.\textsuperscript{117}

<table>
<thead>
<tr>
<th>Recommendations: Gambling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preventive intervention type</td>
</tr>
<tr>
<td>Screen</td>
</tr>
<tr>
<td>Screen</td>
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<tr>
<td>Screen</td>
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<tr>
<td>Screen</td>
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</tbody>
</table>
### Recommendations: Gambling (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>Description</th>
<th>Management options for problem gambling include:</th>
<th>Opportunity</th>
<th>Code</th>
<th>Page Range</th>
</tr>
</thead>
</table>
| 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 coexistent and complicating factors such as depression and substance abuse  
• referral to gambling support helplines and websites (see Resources)  
• referral to gambling treatment centres | Opportunistic | GPP | 115,122,125–127 |

| Environmental | Young people aged from 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 | N/A | IIIIB | 122,123,132,135 |

| Communities | | Adopt or support community focused activities (eg. community campaigns) that promote strategies to control gambling and related harms | N/A | GPP | 114,117,119 |

### Resources

- ‘Let’s talk about gambling’ (Aboriginal Health and Medical Research Council)  
  [www.aboriginalgamblinghelp.org.au](http://www.aboriginalgamblinghelp.org.au)

- Gambling Help 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](http://www.gamblinghelponline.org.au)

- National problem gambling telephone counselling services  
  National Problem Gambling Hotline: 1800 858 858  
  Gamblers Anonymous: 1800 002 210

- Problem Gambling Research and Treatment Centre  
  Guidelines for screening, assessment and treatment in problem gambling  

### References


60. Australian Institute of Health and Welfare. The health and welfare of Australia’s Aboriginal and Torres Strait Islander people, an overview 2011. Cat. no. IHW 42. Canberra: AIHW, 2011.


Chapter 2

Child health

Author Jenny James
Expert reviewer Hasantha Gunasekara
Immunisation

Background

Immunisation has had a powerful impact in preventing disease in Aboriginal and Torres Strait Islander children. However, Aboriginal and Torres Strait Islander children still have higher rates of vaccine preventable diseases and decreased rates of vaccination coverage when compared to non-Indigenous children. Coverage rates from universally funded vaccines are similar in Aboriginal and Torres Strait Islander children and non-Indigenous children by 24 months of age, but delayed vaccination is more common in Aboriginal and Torres Strait Islander children and fewer are fully vaccinated at 12 months of age. Recent data from the Australian Childhood Immunisation Register showed 91% of children Australia wide were fully vaccinated at 12 months of age, while only 83% of Aboriginal and Torres Strait Islander children were fully vaccinated at the same age.

The Australian Childhood Immunisation Register coverage estimates are reliable with regards to identifying Aboriginal and Torres Strait Islander status of children, however, routine reports on immunisation coverage allow for significant lags in immunisation. The Australian Childhood Immunisation Register’s reporting of coverage rates at 1 year of age are based on completion of vaccinations scheduled at age 6 months or earlier, so data on delays in vaccination in Aboriginal and Torres Strait Islander children may underestimate the magnitude of the problem.

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 sometimes 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 and 23vPPV, both of which are vaccinations recommended for Aboriginal and Torres Strait Islander children only. There is also evidence that non-vaccine serotypes cause a disproportionate amount of disease in Aboriginal children compared to non-Aboriginal children with regards to some vaccine preventable diseases. This has been seen with mumps, invasive pneumococcal disease and meningococcal disease. Therefore, 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 and non-vaccine preventable disease in Aboriginal and Torres Strait Islander children.

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

The National Health and Medical Research Council Australian Immunisation Handbook, 9th edition, identifies no diseases in New South Wales, Victoria, the Australian Capital Territory or Tasmania requiring specific immunisation coverage for Aboriginal and Torres Strait Islander people up to and including the age of 14 years. In other states and territories (health authorities should be
consulted to determine exact geographic boundaries) the following diseases have vaccination requirements specific to Aboriginal and Torres Strait Islander children:

- hepatitis A
- tuberculosis
- pneumococcal disease (requiring a booster dose at 18–24 months of age with 23vPPV)
- Hib infections requiring PRP-OMP vaccine.

They have also identified two diseases requiring immunisation coverage in Aboriginal and Torres Strait Islander people aged from 15–49 years:

- influenza with yearly vaccination recommended for all Indigenous adolescents (and adults) in that age group
- pneumococcal disease with 23vPPV recommended for Aboriginal and Torres Strait Islander adolescents (and adults) with a chronic disease.\(^{14}\)

A large number of interventions can improve immunisation coverage. They can be summarised 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.\(^{15}\)

**Resources**

Catch-up immunisation calculator

Australian Immunisation Handbook
## Recommendations: Immunisation

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunisation*</td>
<td>All children</td>
<td>Conduct regular postnatal review of all infants and offer vaccination</td>
<td>As per Australian standard vaccination schedule</td>
<td>IA</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use the catch-up schedule for all children behind in their vaccination schedule</td>
<td>Opportunistic</td>
<td>IA</td>
<td>14</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
<td>Implement provider/system based interventions: review vaccination status at each clinic visit and make a documented plan for the next vaccination</td>
<td>Every visit</td>
<td>IA</td>
<td>16,17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ascertain local clinic vaccination rates via audits of health records and Australian Childhood Immunisation Register records</td>
<td>N/A</td>
<td>IA</td>
<td>16,18–20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implement recall and reminder systems and computer prompts for staff and patients to address immunisation gaps, particularly in the first 12 months</td>
<td>N/A</td>
<td>IA</td>
<td>16–22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implement an adverse events reporting system</td>
<td>N/A</td>
<td>IA</td>
<td>16–22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
<td>N/A</td>
<td>IA</td>
<td>16–20,22,23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase community demand for vaccinations by: • promoting vaccination to parents, child care staff, and community workers such as Aboriginal and Torres Strait Islander liaison officers • using posters and other visual materials in public places • personalising health records • giving all parents/carers a record in card or book form of their child’s immunisation status • commencing promotional activities for parents of neonates early and in places where parents of very young babies attend</td>
<td>Ongoing</td>
<td>IA</td>
<td>15,16,18,20–24</td>
</tr>
</tbody>
</table>

* Vaccination should be implemented according to best practice recommendations in the Australian Immunisation Handbook and state and territory immunisation schedules
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 to be of public health significance; the data that are available indicate rates of IDA in Aboriginal and Torres Strait Islander children in remote Australia are significantly higher.24,25 IDA is associated with developmental delay of cognitive and psychomotor functions. It is not clear whether the relationship is causal or associative.24,26–31 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 as iron deficient individuals have an increased absorption capacity for other heavy metals, including toxic metals such as lead and cadmium.32

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, and cow’s milk in the first year.26,31–35 Moderate to severe infestations with hookworm, via intestinal blood loss, can also contribute to IDA.24,33,35,36

There are different approaches to the diagnosis of IDA. Haemoglobin (Hb) levels combined with erythrocyte indices are commonly used. Iron indices can also be measured. Another diagnostic pathway is to measure the response in Hb to oral iron therapy, without any measurement of iron indices. 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. In Aboriginal and Torres Strait Islander children, anaemia is most commonly diagnosed by Hb and red cell indices.24,26,31,35 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.37

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. However, there are differing recommendations on the cutoff levels of haemoglobin for definition of anaemia. The Kimberley Aboriginal Medical Services Council defines anaemia in children aged 6–24 months as being Hb <105 g/L, and in children aged 2–11 years as being Hb <115 g/L. The Central Australian Rural Practitioners’ Association define anaemia in children from 6 months of age as being Hb <110 g/L. This has implications for treatment decisions.24,26,35,38–41

Interventions

International guidelines state there is insufficient evidence to recommend either for or against universal screening for IDA in children.28,42 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.\textsuperscript{35} Screening can be done with venous blood, but if there is good training and quality control, point-of-care testing can correlate well with the lab testing.\textsuperscript{24,35,43} Though \textit{Helicobacter pylori} infection is associated with IDA in children, benefits of mass screening are not clear.\textsuperscript{44–46}

Evidence differs with regards 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 older than 6 months. This is a preventive use of iron supplementation, aimed at preventing IDA,\textsuperscript{28,31,32,34,47} as opposed to using it only for therapeutic effect.\textsuperscript{24,26,35,48} This preventive rationale is sometimes considered in areas where there are high prevalence rates of anaemia in the communities of children under question.

There is good evidence to support the widespread use of multicomponent interventions that don't involve medicinal iron supplementation in prevention of IDA. This includes delaying cord clamping beyond 3 minutes, which increases iron stores from birth.\textsuperscript{49–51} 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 health prevention programs such as immunisation and micronutrient supplementation for children with failure to thrive. Interventions can be delivered through local healthcare providers including GPs and Aboriginal and Torres Strait Islander health workers, and through government funded nutritional supplementation programs.\textsuperscript{24,26,31,32,34,35,47,52}

There is good evidence that oral iron supplementation has a beneficial effect on some cognitive domains in iron deficiency and IDA in children older than 6 years of age. Iron supplementation provided as ‘sprinkles’ shows promise,\textsuperscript{53–55} as it may have fewer side effects and improve adherence to daily iron supplementation. However, this has not been borne out in all studies.\textsuperscript{56} It is not clear whether oral iron supplementation in children with IDA younger than 6 years 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.\textsuperscript{34,48,57}

Exclusive breastfeeding until 6 months has many benefits and is currently recommended Australia wide,\textsuperscript{52,58} however, there are concerns that this may not provide enough iron to babies at increased risk of IDA.\textsuperscript{26,31,33} In such instances, introduction of iron fortified weaning foods at 4 months or supplementation with oral iron have been suggested. While IDA is often associated with failure to thrive in Aboriginal and Torres Strait Islander children, treatment of iron deficiency does not appear to improve growth.\textsuperscript{48,59}

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.\textsuperscript{60–62}

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.\textsuperscript{31,42,47,52,63}
## Recommendations: Anaemia

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All children aged &gt;6 months from communities with a high prevalence of iron deficiency anaemia (IDA)</td>
<td>Take a nutritional history asking about intake of iron rich foods such as meat and fortified cereals, leafy green vegetables and vitamin C intake with meals</td>
<td>At age 6–9 months and repeat at 18 months</td>
<td>GPP</td>
<td>28,42</td>
</tr>
<tr>
<td></td>
<td>Children in other areas with risk factors:</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• history of low birthweight or pre-term birth</td>
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</tr>
<tr>
<td></td>
<td>• maternal anaemia</td>
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</tr>
<tr>
<td></td>
<td>• twin</td>
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<tr>
<td></td>
<td>• failure to thrive</td>
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<tr>
<td></td>
<td>• chronic infections</td>
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<tr>
<td></td>
<td>Perform haemoglobin (Hb) via point-of-care capillary sample or venous blood (including blood film)†</td>
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</tr>
<tr>
<td></td>
<td>Test at age 6–9 months and repeat at 18 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>More frequent testing if IDA is diagnosed</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>GPP 30,35 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>Babies born without risk factors for IDA (see below)</td>
<td>Recommend exclusive breastfeeding to 6 months</td>
<td>Opportunistic</td>
<td>IB</td>
<td>26,31,52,58</td>
</tr>
<tr>
<td></td>
<td>Babies born with low birthweight (&lt;2500 g), prematurity (&lt;37 weeks) or to mothers who had maternal anaemia</td>
<td>Recommend exclusive breastfeeding to 4 months</td>
<td></td>
<td>GPP</td>
<td>26,31,33</td>
</tr>
<tr>
<td></td>
<td>All babies</td>
<td>Introduce iron rich foods at weaning. Examples include meat (three serves per week), fortified cereals, leafy green vegetable, eaten with vitamin C rich food (e.g. fresh citrus fruit) Also discuss withholding cow’s milk until 12 months of age and avoiding tea</td>
<td></td>
<td>IB</td>
<td>26,31,52,58</td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>Babies aged &lt;6 months with IDA risk factors as above</td>
<td>Consider oral iron supplementation in consultation with a paediatrician</td>
<td></td>
<td>GPP</td>
<td>35</td>
</tr>
<tr>
<td>Environmental</td>
<td>Children with IDA</td>
<td>Include children on recall registers for regular review and Hb repeat testing as per above</td>
<td>N/A</td>
<td>GPP</td>
<td>31</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>-----</td>
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<td>----</td>
</tr>
<tr>
<td>Communities with a known high prevalence of IDA</td>
<td>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 (see Chapter 1: Lifestyle, section on overweight/obesity)</td>
<td>Immediately and ongoing</td>
<td>IA</td>
<td>GPP</td>
<td>31,42,47,52,63</td>
</tr>
</tbody>
</table>

* Diagnose IDA using erythrocyte indices (eg. blood film, mean cell volume) and Hb levels of less than 110 g/L in children over 6 months of age. Consult local laboratories for reference limits of Hb levels in children >2 years

† There are jurisdictional differences in the screening for anaemia (eg. Queensland and the Northern Territory) and local guidelines should be consulted

**Resource**
Iron deficiency anaemia assessment, prevention and control: a guide for programme managers (WHO)
Growth failure

Background
Growth failure is the principal manifestation of malnutrition in children. The terms growth failure 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. There are three different growth charts (Centers for Disease Control, World Health Organization and National Center for Health Statistics) used in Australia by various health authorities and medical software companies, so it is important to be consistent with the chart being used and to consider the growth parameters in the context of the health of the child.

The most common dietary problem in Aboriginal and Torres Strait Islander children is insufficient weaning foods from 6–24 months of age. In Aboriginal and Torres Strait Islander children this usually involves a vicious cycle of malnutrition and infection. In all populations it may reflect any one or a combination of the following: multicomponent feeding difficulties (often related to lack of food security), chronic ill health, living in a context of poor 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 show high rates of other paediatric complex and chronic conditions such as chronic suppurative otitis media, rheumatic fever, rheumatic heart disease and fetal alcohol syndrome. Such communities may also have high rates of notifications of child abuse and neglect, though how many of these notifications are substantiated is not clear from the data.

The long term health sequelae from childhood growth failure are significant. There is evidence that intrauterine growth restriction and growth failure in early childhood is associated with the development of obesity in later childhood and adult cardiovascular disease. Increased risks for secondary disability from FTT, including cognitive, neurological and psychomotor deficits persist despite interventions. However, permanent growth retardation may be able to be prevented with early and intensive secondary interventions once a child has FTT. These findings underscore the importance of primary prevention of FTT, because despite rapid and appropriate interventions in a child diagnosed with FTT, some of the serious secondary disabilities will be unable to be prevented.

Approaches to FTT in different parts of the world share some similarities, but need to be context specific. In Aboriginal and Torres Strait Islander community settings, interventions to prevent FTT need to address the social determinants of health, which implies improvements in areas such as overcrowded living conditions, housing, hygiene, education and employment. Evacuating children to hospital for tube-feeding in an attempt to achieve rapid catch-up growth may have deleterious effects in the long term.

Interventions
A detailed history, physical examination and assessment for psychosocial deprivation and developmental assessment are important. In the primary care setting, major organic disease is uncommon (<5%) and can usually be suspected on clinical assessment and appropriate lab testing. 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.\textsuperscript{23,24,75} There is evidence that action plans are lacking after identification of growth faltering in Aboriginal and Torres Strait Islander children. This is of particular concern in areas with high staff turnover, where there are practitioners providing services for short blocks of time. Existing systems may not always be providing for adequate follow up of growth faltering.\textsuperscript{62}

Growth monitoring is often recommended as an opportunistic activity to undertake with usual clinical care, rather than as a specific screening tool. This is particularly the case when growth monitoring is reviewed with regards to its usefulness in diagnosis of FTT.\textsuperscript{76} One important systematic review\textsuperscript{67,77} recommended that growth monitoring be integrated into a broader primary healthcare program and stressed the need for effective follow-on action. Some guidelines recommend minimum intervals, and the current RACGP \textit{Guidelines for preventive activities in general practice} (\textit{red book}) recommend weight/height/head circumference at 7 days, then at 6–8 weeks, then at 4, 6, 12 and 18 months.\textsuperscript{52,78} It makes the point that weight may need to be monitored more frequently if there are clinical concerns. One guideline for Aboriginal and Torres Strait Islander health settings recommends even more frequent monitoring of weight, height and head circumference.\textsuperscript{75} Some guidelines recommend against such regular monitoring.\textsuperscript{23} Irrespective of frequency, growth monitoring in situations of malnutrition should be coupled with history gathering and counselling, finding out about food intake patterns and understanding from the caregiver’s perspectives what they feel about their child’s development and growth. In many growth monitoring programs it has been noted that the skill and experience necessary for such counselling are not available because use is made of low skilled staff or volunteers. Health professionals do not often engage in counselling because they do not receive adequate training in counselling, are not supervised when beginning to practise it or because workloads do not permit it.\textsuperscript{76} Interpretation of growth charts is not necessarily straightforward either. 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.\textsuperscript{79} Interpretation of growth charts needs to be done with a knowledge of the health context of the community within which a health professional works.

FTT has been associated with depressed developmental test scores.\textsuperscript{71} There is strong evidence to support publicly funded, centre based, comprehensive early childhood development programs for children from low income backgrounds aged 3–5 years, 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.\textsuperscript{80} However, such programs may be useful as secondary 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.\textsuperscript{78} Other Australian guidelines also recommend developmental surveillance be tied in with routine child checks rather than singled out.\textsuperscript{23} 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. Use of parent reporting as in ASQ or PEDS can be used, or others administered by the health professional such as DDST.\textsuperscript{23,81}
While 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. There is some evidence that neglect may be more common in communities that 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 of how other people in similar circumstances have been able to meet those needs. The effects of many programs to prevent neglect are not known and outcome evaluations of child maltreatment prevention interventions are exceedingly rare in low and middle income countries. A Cochrane review showed insufficient evidence to support parenting programs as an intervention in child abuse including neglect. 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 an Indigenous child health worker.

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. Cost effectiveness of home visiting programs aimed at preventing neglect has been evaluated in vulnerable families with maternal sensitivity and infant co-operativeness being among the operational outcomes. No author judgement was made on whether the benefits were worth the costs. 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.

There is evidence that fetal alcohol syndrome, independent of the effects of poor nutrition, is associated with growth deficits in children. Not drinking during pregnancy is the safest option. Brief interventions have been shown to be effective in reducing alcohol use during pregnancy and postnatally.

There are many studies providing evidence that providing multiple micronutrients (MMN) to pregnant women improves birthweights of babies, and may have other beneficial effects on pregnancy outcomes as well. Supplementation with single nutrients does not appear to have the same effect. Single micronutrient (MN) zinc supplementation given during pregnancy may decrease prematurity of infants but does not increase birthweight. In contrast, the evidence is more mixed with regards to whether MMN given to children in the first 2 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. Study variability is large, in terms of what was given, what dose, what duration, baseline characteristics of children, and whether MN were combined with other strategies to enhance growth. Some studies show that MN do not improve growth, and others show that MMN do improve growth. It has also been noted that 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, rather than to prevent growth faltering. Most evidence states that zinc supplements given to children in the first year of life can reduce
illnesses such as respiratory infections or acute and chronic diarrhoea. There is evidence that zinc supplementation is of no benefit in preventing growth faltering. There is evidence of benefit from vitamin A supplementation in populations with moderate to severe vitamin A deficiency. Chemoprophylaxis using deworming regimens has also been shown to confer benefit to children living in areas known to have high rates of infestation. 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. However, it has been noted to be very context specific 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 ‘hands-on’ skills development, be tailored to the educational level and needs of the mother’s and to family resources and include strategies for behaviour change, and be ongoing and delivered by nutrition paraprostessionals and/or peer supporters. One important systematic review found evidence that effective nutrition counselling was often part of a multifaceted intervention and involved education to not only carers, but also to community health workers and community representatives. Parenting in an Aboriginal and Torres Strait Islander community often includes the role of 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. 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. In the context of Aboriginal and Torres Strait Islander health, home visits to relay nutritional information are recommended. There is evidence that if doctors improve their knowledge and counselling skills around nutrition this may be helpful in the prevention of FTT.

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 7 days. Guidelines recommend confirmation of lactose intolerance with Clinistest tablets before treatment. There is evidence that encouraging certain eating behaviours may be helpful in improving nutrition for children in low income households. This includes 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.

There are similarities and differences in scientific versus lay perspectives on growth. Scientific perspectives focus on the extreme ends of poor health and look forward to adult outcomes, but lay perspectives are 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 very poor and that their idea of a ‘norm’ may not reflect a healthy nutritional status.24,106,107

Food insecurity is a major problem in many remote and urban Aboriginal and Torres Strait Islander communities (see Chapter 1: Lifestyle, overweight/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 refrigerator, lack of transport to get to the shop, and excess expenditure on substances such as cigarettes and alcohol, and other substances. Such problems need to be addressed by long term co-operation and commitment of intersectoral bodies working with local communities so that appropriate action plans can be enacted.108

Community feeding programs supply supplementary foods to children at risk of FTT, often on a population basis, though children can be individually targeted if there are risk factors for FTT. Food may be distributed for no cost through childcare centres and schools, exceeding what is usually provided in such places or given out through health services. Such programs have been used to overcome food insecurity barriers, without the need to alter community infrastructure. Using community feeding programs has mixed evidence, with one systematic review67,77 stating such programs should only be relatively short term and must be supported by the community. Another review shows support for this approach.74

Recommendations: Growth failure

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All children</td>
<td>Recommend growth monitoring (including weight, length, head circumference, nutritional and psychosocial assessment to coincide with child health visits for immunisation* (see Table 2.1)</td>
<td>At 2, 4, 6, 12, 18, 24 and 36 months and between 4 and 5 years</td>
<td>Monitor weight more frequently if there are concerns</td>
<td>IA 52,62,67,104</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24,52,67,75,77,78</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All children</td>
<td>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</td>
<td>Opportunistic</td>
<td>IA 24,74,106,107</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assess developmental milestones (gross motor, fine motor, speech and language, social interactions) with growth monitoring checks Consider using parent report questionnaires and questions in patient held record (see Chapter 7: Table 7.1)</td>
<td>At 2, 4, 6, 12, 18, 24 and 36 months, and between 4 and 5 years</td>
<td>IA 25,78</td>
<td></td>
</tr>
</tbody>
</table>
Mothers

Promote breastfeeding by discussing the health benefits, use of peer support, face-to-face health professional and postnatal home visits

Opportunistic

IB

52

All families

Provide nutrition education counselling targeting both families and community workers

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

Opportunistic

IB

23,52,67,73,77

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

67,77,85,109

GPP

Chemoprophylaxis

Children living in areas with high rates of helminth infections

Recommend anti-helminth treatment with a single dose of albendazole

Refer to Australian Therapeutic Guidelines for dosing regimen

Opportunistic

IA

67,75,77

Environmental

Community food supplementation programs may be used short term to overcome issues of lack of food security, providing they have the support of the community and are part of a multifaceted intervention

N/A

IA

67,77

* Correction for prematurity must be made until 18 months for head circumference, 2 years for weight and 40 months for height. Measure length if <2 years and height if >2 years. Measure head circumference until 36 months of age and body mass index (BMI) from 2 years of age. Be sure equipment is calibrated and measurements are accurately done.

### Table 2.1. 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 (refrigerator) availability, numbers of people living at home, food preferences, food preparation equipment availability, facilities to maintain hygiene and hygiene practices
- Involve the carer in finding 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 the child to a team approach involving an Aboriginal and Torres Strait Islander health worker, community nurse, family support worker and dietitian if there are indications that the child is at risk of FTT or showing early signs of growth faltering
- Document review dates and begin next review by review of previous action plan
Childhood kidney disease

Background

Aboriginal and Torres Strait Islander adults have very high rates of end stage renal disease (ESRD) and there is evidence it is increasing.\(^4,110,111\) Renal disease can start in utero and has been linked with low birthweight.\(^112\) Aboriginal and Torres Strait Islander children have higher rates of urinary tract infection (UTI), renal calculi and glomerulonephritis than non-Indigenous children, though much of the current evidence for this comes from the more remote parts of Australia. There is a lack of studies into incidence rates of these diseases from urban areas. The vast majority of these children will make a full clinical recovery from these renal illnesses.\(^24,113–117\)

There is mixed evidence as to whether renal disease occurring in childhood contributes to high rates of chronic kidney disease (CKD) in Aboriginal and Torres Strait Islander adults. Risk factors for CKD seen in children, such as haematuria and proteinuria, are often transient\(^116,118–120\) with the exception of microalbuminuria in children with pre-pubertal and pubertal onset diabetes.\(^121,122\) 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. Baseline CKD risk factors are frequent in both Aboriginal and non-Aboriginal primary school aged children, though there is evidence that, at a single test, Aboriginal children have a greater risk of haematuria than non-Aboriginal children. Higher rates of transient haematuria may reflect the higher incidence of transient disease seen in Indigenous children, such as post-infectious glomerulonephritis.\(^23,42,81,116,118,119,123,124\)

Though most children make an apparent full recovery from acute post-streptococcal glomerulonephritis (APSGN), in some Aboriginal and Torres Strait Islander communities children who had APSGN have six times greater risk of developing renal disease as an adult. Thus it is not clear whether the link between APSGN and adult onset CKD is causative or associative. However, the possibility of a causative link makes the prevention of streptococcal skin disease an important issue for Aboriginal and Torres Strait Islander children. There is good evidence that prevention and treatment of skin infections may be helpful in prevention of APSGN. Children with skin sores and household contacts of such children should be given targeted treatment with antiscabietics and benzathine penicillin. However, there are different recommendations regarding the extent of chemoprophylaxis coverage that is required in the community. At a population level, regular community based programs may be useful to screen and treat all children in a target age group (eg. ages 0–3 years) 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.\(^115,120,125\) There is good evidence that improvements in housing to reduce overcrowding and promotion of regular washing for children will also help prevent skin sores.\(^113,117,125,126\)

There is a similar lack of certainty around the link between childhood UTI and adult ESRD. It is not clear what the true rate of ESRD caused by pyelonephritic scarring/reflux nephropathy is, nor is it clear what proportion of these people had a UTI in childhood.\(^127\) The lack of certainty surrounding this link is reflected in the recommendations, where there is mixed evidence for the use of antibiotic prophylaxis routinely following first time UTI. Some studies show that even in children with vesicoureteric reflux, antibiotic prophylaxis is not superior to supportive care in preventing subsequent UTIs or renal
parenchymal injury, and in fact can produce harm. Other studies support the use of prophylactic antibiotics following a first-time UTI at least until any imaging studies are completed. However, asymptomatic bacteriuria in infants and children should not be treated with prophylactic antibiotics, though it is reasonable to consider antibiotic prophylaxis in infants and children who have had recurrent UTI. Some behavioural and environmental preventive activities for children who have had one UTI can decrease the chances of further UTIs. However, there is no evidence that long term outcomes, after a first-time typical UTI, are improved by the use of investigations in children over the age of 6 months.

While high grade vesicoureteric reflux (VUR) is associated with kidney damage, there is no evidence that continuous antibiotic prophylaxis in children with this condition is effective in reducing the rate of pyelonephritis recurrence and the incidence of renal damage in children with VUR. Some of the kidney damage caused by high grade VUR occurs prenatally. Even though the incidence of VUR is increased in the siblings and children of those with VUR, there is no evidence that screening for VUR in these subgroups will result in any benefit as the value of identifying and treating VUR is unproven. Circumcision reduces the risk of UTI in boys but has a significant complication rate of haemorrhage and infection, so is not recommended routinely to prevent UTIs. However, in boys with recurrent UTI or high grade VUR there may be a possibility of a net clinical benefit from circumcision given this particular subset of boys has a higher chance of UTI recurrence.

Renal calculi in Aboriginal children are predominantly radiolucent uric acid stones and present on average at 24 months of age, though some have been apparent in children as young as 8 months. They usually occur in the upper renal tract and are rare in children living in urban areas. They have been linked with chronic diarrhoea and environmental induced enteropathy. There is no evidence linking childhood renal calculi to the higher rates of ESRD seen in Aboriginal and Torres Strait Islander adults.

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 3 years, and younger if there are risk factors for high blood pressure such as obesity. However, this screening is not primarily recommended for 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. Other evidence either makes no comment about screening for blood pressure in children, or supports explicit recommendations for not using blood pressure to screen for renal disease. This is particularly so when blood pressure screening is discussed with regards to being a marker of undiagnosed kidney disease in children. Screening recommendations include much discussion about the importance of taking blood pressure correctly and interpreting the findings carefully. This includes recommendations for:

- auscultation to be used in conjunction with mercury or aneroid sphygmomanometers rather than use of automated devices
- correct positioning of the child
- correct cuff size according to the size of the child’s arm
- being particular in interpretation of blood pressure values according to age, gender and height
- repeat measurements of blood pressure to validate an abnormal finding followed by referral for appropriate work-up if hypertension is confirmed.
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 on different fronts. The practice of measuring blood pressure to ensure accuracy of readings and the interpretation of values is more complicated in children than for adults and is thus vulnerable to a fair degree of equipment and practitioner error. It may make community based screening unnecessarily difficult, and divert efforts into directions where the evidence of gain for the child is only mixed and not validated for Aboriginal and Torres Strait Islander populations.

### Recommendations: Childhood kidney disease

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All children without a high risk condition</td>
<td>Routine urinalysis or blood pressure screening for kidney disease is not recommended unless there is a clinical indication</td>
<td>N/A</td>
<td>IA</td>
<td>23, 42, 81, 116, 118, 119, 123, 124</td>
</tr>
<tr>
<td></td>
<td>Children living in areas with high rates of infectious skin disease (scabies and impetigo)</td>
<td>Check the skin for scabies and impetigo and treat according to management guidelines</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>GPP</td>
<td>64, 120</td>
</tr>
<tr>
<td></td>
<td>Children with first episode UTI</td>
<td>Assess need for imaging tests based on treatment response within 48 hours and whether atypical features are present (see Table 2.2)</td>
<td>As needed</td>
<td>IB</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td>Children with pre-pubertal and pubertal onset diabetes</td>
<td>Check albumin to creatinine ratio (ACR) using single voided specimen, morning specimen preferred</td>
<td>5 years after diagnosis or at age 11 years, or at puberty (whichever is earlier), then annually thereafter</td>
<td>IA</td>
<td>121, 122</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>Children who have had at least one episode of UTI</td>
<td>Identify and correct predisposing factors for recurrence (including constipation, dysfunctional elimination syndromes, poor fluid intake and delays in voiding)</td>
<td>As needed</td>
<td>IA</td>
<td>127</td>
</tr>
<tr>
<td><strong>Chemo-prophylaxis</strong></td>
<td>Children living in areas with high rates of infectious skin disease (scabies and impetigo)</td>
<td>Treat household contacts of someone with scabies with 5% permethrin cream if over 2 months old and sulphur 5% or crotamiton cream if &lt;2 months of age in communities where there are outbreaks of infected scabies, offer all household contacts of people with impetigo a single dose of benzathine penicillin G (see Resources)</td>
<td>As needed</td>
<td>IIIC</td>
<td>113, 117, 120</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Children living in areas with high rates infectious skin disease (scabies and impetigo)</td>
<td>Promote good hygiene practices at home Refer to relevant housing support services to promote access to adequate washing facilities and toilets</td>
<td>Opportunistic</td>
<td>IA</td>
<td>113, 120</td>
</tr>
<tr>
<td></td>
<td>Children based interventions that use screening and immediate treatment for skin sores and scabies in targeted age groups should be combined with simultaneous treatment of the whole community for scabies (see Resources)</td>
<td>N/A</td>
<td>IA</td>
<td>113, 117, 120</td>
<td></td>
</tr>
</tbody>
</table>
Table 2.2. Recommended imaging following first presentation with UTI

<table>
<thead>
<tr>
<th>Infants younger than 6 months</th>
<th>Test</th>
<th>Responds well to treatment within 48 hours</th>
<th>Atypical UTI*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ultrasound during the acute infection</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Ultrasound within 6 weeks</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DMSA 4–6 months following the acute infection</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>MCUG</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Children aged 6 months to 3 years</th>
<th>Test</th>
<th>Responds well to treatment within 48 hours</th>
<th>Atypical UTI*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ultrasound during the acute infection</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Ultrasound within 6 weeks</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DMSA 4–6 months following the acute infection</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>MCUG</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Children aged 3 years or more</th>
<th>Test</th>
<th>Responds well to treatment within 48 hours</th>
<th>Atypical UTI*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ultrasound during the acute infection</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Ultrasound within 6 weeks</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>DMSA 4–6 months following the acute infection</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>MCUG</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

DMSA = dimercaptosuccinic acid scan (an intravenous radionuclide scan for assessing renal function), MCUG = micturating cystourethrogram
* Atypical UTI features include: the patient is seriously ill, poor urine flow, abdominal or bladder mass, raised creatinine, septicemia, failure to respond to treatment with suitable antibiotics within 48 hours, infection with non-E. coli organisms
† MCUG should not be performed routinely but should be considered if any of the following features are present: dilatation on ultrasound, poor urine flow, non-E. coli infection, family history of VUR
Source: National Collaborating Centre for Women’s and Children’s Health, 2007. Refer to this resource for imaging recommendations for recurrent UTI.

Resource
Guidelines for community control of scabies, skin sores and crusted scabies in the Northern Territory (Northern Territory Department of Health and Families)
References


Chapter 3

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, the NSW Centre for the Advancement of 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 defined age range of 10–19 years.

The preventive health issues for young people are very broad. To narrow the scope for the National Guide, this chapter focuses on three topics: psychosocial assessment, the prevention of unplanned pregnancies, and illicit substance use. Other areas relevant to youth health, in particular smoking, physical activity, obesity, alcohol, sexual health, depression and suicide, are addressed in other chapters.

According to the World Health Organization, ‘Nearly two thirds of premature deaths and one-third of the total disease burden in adults are associated with conditions or behaviours that began in youth, including tobacco use, a lack of physical activity, unprotected sex or exposure to violence. Promoting healthy practices during adolescence, and efforts that better protect this age group from risks will ensure longer, more productive lives for many’.\(^3\)

Young people’s specific developmental and health needs are distinct from that of children or adults. Their sexual and reproductive health in particular tend to be different from those of adults.\(^4\) 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/sexual abuse and neglect and homelessness. Adolescence is a period of risk taking and experimentation, thereby providing greater potential for adverse health outcomes. Despite this, young people underutilise primary care, are reluctant to seek help for health problems and seldom receive counselling about risk taking behaviours when they do.\(^5–7\) Clinician training and charting tools are associated with increases in rates of screening and counselling of adolescents about risky behaviours.\(^8\)

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

In the 2006 census, around 120,378 people identified as Aboriginal, Torres Strait Islander or both in the age group 12–24 years.\(^9\) They comprise 3.4% of the total Australian population of young people in that age range and 26.5% of the total Aboriginal and Torres Strait Islander population.\(^9\) By contrast, young people comprise 18% of the total Australian population. Most Aboriginal and Torres Strait Islander young people live in major cities and inner and outer regional areas, however, they account for over half of all young people in Australia living in very remote areas.\(^9\)

Among the general Australian youth population, the leading causes of death and illness are accidents and injuries (unintentional and self inflicted), mental health problems (including depression and suicide) and behavioural problems (including illicit drug use). Half of all deaths in those aged under 19 years are caused by injuries.\(^10\) The overall death rate and the injury death rate for Aboriginal and Torres Strait Islander young people are four and five times greater than for non-Indigenous young people respectively.
In 2004–05, young Aboriginal and Torres Strait Islander people aged 15–24 years were less likely to rate their health as excellent or very good, compared to young non-Indigenous people (59% compared to 70% respectively).2 Aboriginal and Torres Strait Islander young people were slightly more likely than non-Indigenous young people to rate their health as fair or poor (9% compared to 7%). They are more likely to experience health risk factors such as obesity, physical inactivity, smoking, lower educational attainment and imprisonment. Fifty percent of Aboriginal and Torres Strait Islander young people aged 18–24 years are smokers, compared to 26% of their non-Indigenous counterparts. In the 18–24 years age group, the prevalence of a long term health condition is 1.5 times greater than for non-Indigenous young people. Hospital separations due to mental and behavioural disorders (including substance and alcohol abuse) are 1.6 times greater than non-Indigenous youth in several Australian states.

Among the general population in 2005, half of sexually transmissible infections (STIs) notifications were for young people aged 12–24 years.2 In the same period 13% of all chlamydia notifications, 64% of all gonococcal notifications and 56% of all syphilis notifications were for Aboriginal and Torres Strait Islander young people. Aboriginal and Torres Strait Islander youth are less likely to access primary healthcare services and are more likely to present to tertiary healthcare services than non-Indigenous young people. 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 providing effective preventive interventions.1,7,11,12

Note: a detailed review of unplanned pregnancy and illicit drug use epidemiology is provided in separate sections.
Psychosocial

Background

Since the aetiology of most illness in young people is psychosocial, a comprehensive psychosocial assessment is considered one of the cornerstones of primary healthcare for young people. There is, however, limited evidence on its effectiveness in improving health outcomes and current recommendations rely on expert opinion. The HEEADSSS assessment is the most widely recommended psychosocial assessment tool both nationally and internationally. It is a systematic, structured and graded approach and designed so that topics perceived to be non-threatening are broached before moving to more sensitive issues. Appendix 3.1 provides a table showing adolescent development stages. Appendix 3.2 provides the assessment questions. HEEADSSS has been endorsed by the University of Melbourne Centre for Adolescent Health, the NSW Centre for the Advancement of Adolescent Health, the RACGP and state funded family planning organisations such as Family Planning Queensland.

The HEEADSSS assessment is recommended to be conducted as part of an annual health assessment. Numerous organisations including the US Preventive Services Task Force, the American Academy of Paediatrics and the American Medical Association have produced guidelines recommending annual screening of young people for high risk behaviours. In Australia, the Medicare health assessment items for Aboriginal and Torres Strait Islander people provide an opportunity to conduct funded annual health assessments. 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 assessment for young people.

<table>
<thead>
<tr>
<th>Recommendations: Psychosocial assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preventive intervention type</strong></td>
</tr>
<tr>
<td>Screening</td>
</tr>
</tbody>
</table>

Useful tools include the HEEADSSS assessment (see Appendix 3.2)
Unplanned pregnancy

Background
In 2008, almost 19% of all births in Australia were to young women aged 15–24 years. In 2003, more than half of pregnancies in young women aged 15–19 years resulted in induced abortions. This implies that many pregnancies in young women are unplanned events. In addition, teenage pregnancies are associated with increased risk of pre-term births, small-for-gestational-age babies and neonatal deaths. Teenage mothers often find it difficult to complete their education, can be separated from the child’s father, often have less financial resources than older mothers, and their children tend to have worse health. Children of adolescent parents have increased risk of developmental delay, behavioural problems, substance abuse, early sexual activity and becoming teenage parents themselves.

Aboriginal and Torres Strait Islander young women are more likely to get pregnant and smoke during pregnancy, and are at greater risk of adverse outcomes for themselves and their babies. In 2005, the age specific fertility rate of Aboriginal and Torres Strait Islander young women in the age group 15–19 years and in the age group 20–24 years was 4.3 times and 2.3 times higher than for non-Indigenous young women respectively. In 2008, 20% of Aboriginal and Torres Strait Islander mothers were teenagers compared to 3.5% of non-Indigenous mothers. Aboriginal and Torres Strait Islander women of all ages have babies with a three times higher prevalence of low birth weight, and two times higher prevalence of pre-term deliveries. Pregnant Aboriginal and Torres Strait Islander young women are also more likely to have fewer antenatal attendances. In 2004–05, 34% of all hospitalisations for Aboriginal and Torres Strait Islander young people were due to pregnancy related complications. Congenital abnormalities are more prevalent in Aboriginal and Torres Strait Islander than in non-Indigenous babies, particularly for babies born to teenage mothers.

Evidence of effectiveness of preventive interventions
The clinic visit can be used to engage the young person in a discussion targeting reproductive health, or within the context of broader and more general health issues. Indeed, commencing the consultation with a more general approach is better suited to the needs of a young person. Experts in Australia, the USA and the UK recommend three interventions for young people: anticipatory guidance/counselling, screening for sexual activity and at risk sexual behaviour, and appropriate counselling for preventing unplanned pregnancies.

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 healthcare’. There is a paucity of good quality studies assessing the effectiveness of counselling on unplanned pregnancies. Consequently recommendations are generally based on expert opinion and suggest that counselling should include ‘advice on how to prevent unplanned pregnancies, all methods of reversible contraception, how to get and use emergency contraception, and to provide supporting information in an appropriate format’. Parents or guardians should also receive health guidance at least one time each during the young person’s early, middle and late adolescence.

Barrier methods of contraception, especially male condoms, are effective for both pregnancy prevention and reducing risk of some 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. Condoms are recommended as a primary prevention intervention but ongoing education with emphasis on consistent and proper use is important.

Chemoprophylaxis

Hormonal contraception includes the oral contraceptive pill (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 include progestogen-only injections, progestogen-only subdermal implants and progestogen-only intrauterine devices (IUDs) while copper intrauterine devices are a form of non-hormonal LARC. Unlike the oral contraceptive pill (OCP), effectiveness of LARC does not depend on daily compliance. There is scant but reassuring literature on the use of IUDs in adolescents. 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 under 18 years. Subdermal progestogen LARCs are not known to be associated with reduced bone mineral density. On the basis of extrapolated evidence, all other hormonal contraception has the same safety and efficacy profile in young women as in adult women.

According to the 2004–05 National Aboriginal and Torres Strait Islander Household Survey, condoms followed by the OCP were the main methods of contraception reported by young Aboriginal and Torres Strait Islander women aged 18–24 years in 2004–05, 25% and 16% respectively. Implants and injections were reported by 6% each. An estimated 14% of young Aboriginal and Torres Strait Islander women reported not using any contraception.

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.

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. 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 a study involving adolescents, experience with emergency contraception was associated with an increased probability of condom use and an increased perceived capacity to negotiate condom use. It is therefore reasonable 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 and middle income countries and high income countries. They include school based programs, community based programs, family planning clinics, workplace programs, mass media programs (social marketing) and health facility based programs. Overall, most programs have a positive impact on knowledge and attitudes, and no impact on sexual activity or delaying initiation of sexual intercourse. There is some evidence that programs can be effective in increasing contraceptive use and to a much lesser extent reducing pregnancy rates. In one systematic review of educational interventions to inform contraceptive choice, theory based groups consistently demonstrated favourable
results. These included social cognition models (particularly social cognitive theory), motivational interviewing and the AIDS risk reduction model. 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. Abstinence programs were the least successful intervention.

## Recommendations: Unplanned pregnancy

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All young people aged 12–24 years</td>
<td>Ask if sexually active and identify at risk sexual behaviours (e.g. unprotected sexual intercourse: see Chapter 8: Table 8.1)</td>
<td>Opportunistic and as part of an annual health assessment (including psychosocial assessment)</td>
<td>GPP</td>
<td>1,11</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All young people</td>
<td>Provide anticipatory guidance* and sexual health education, tailoring the information according to whether a young person is sexually active or not (see Chapter 6: Sexual health and bloodborne viruses) Discuss should include the following: • sexual development and sexual feelings • prevention of unplanned pregnancies including abstinence • resisting sexual and peer pressure • methods of reversible contraception, access to and use of emergency contraception</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>GPP</td>
<td>1,11,27</td>
</tr>
<tr>
<td>Young people who are considering initiating sexual activity or who are sexually active</td>
<td>Recommend use of and/or provide condoms Discuss the proper methods for condom usage</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IIC</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Young people engaging in risky sexual behaviour</td>
<td>Use individual behaviour change techniques such as brief interventions (e.g. information giving, motivational interviewing) and cognitive behavioural therapy 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 (see Table 3.1)</td>
<td>Opportunistic</td>
<td>GPP</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Parents or guardians of young people</td>
<td>Provide health guidance to parents and other guardians regarding youth sexual health following the principles of anticipatory guidance*</td>
<td>At least once at early, middle and late adolescence</td>
<td>GPP</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>
Chemoprophylaxis

Young females who are sexually active or considering initiating sexual activity

Assess suitability for and offer hormonal contraception. Methods include the oral contraceptive pill and long acting reversible contraception (i.e. progestogen only injections, progestogen only subdermal implants, progestogen only IUDs)

Opportunistic IIIC 31,32

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 IIIB 26

Environmental

N/A

Promote youth friendly primary healthcare services

N/A GPP 1

* Anticipatory guidance is a developmentally based counselling technique that focuses on a young person’s stage of development. Counselling is focused towards 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 healthcare1

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

Table 3.1. The AIDS risk reduction model

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

<table>
<thead>
<tr>
<th>Stage</th>
<th>Influences</th>
</tr>
</thead>
</table>
| 1. Recognition and labelling of one’s behaviour as high risk | - Knowledge of sexual activities associated with HIV transmission  
- Believing that one is personally susceptible to contracting HIV  
- Believing that having 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: information seeking  
obtaining remedies  
enacting solutions | - 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 |

Depending on the individual, phases may occur concurrently or phases may be skipped

Source: Family Health International 2002”
Illicit drug use

Background

Young people most commonly acquire illicit drugs through a friend, acquaintance or relative. Curiosity, peer pressure and wanting to do something exciting are the most common reasons for initiating illicit drug use. Reasons for not initiating drug use are not being interested, and concerns over health, addiction and the law. When compared with non-Indigenous people, Aboriginal and Torres Strait Islander people are twice as likely to be recent users of illicit drugs (25% compared to 14.7%), are more likely to engage in risky drug use and polydrug use, experience greater drug related harm and are more likely to begin using illicit drugs at a younger age.40–42

There are social, legal and health related harms associated with illicit drug use. Polydrug use is not common among youth in general, but when it occurs it is a major risk factor for subsequent drug related harm.43,44 The 2010 National Drug Strategy Household Survey 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.40 There was a statistically significant rise in the proportion of recent users with a mental illness between 2007 and 2010.

Cannabis use is associated with lower educational attainment, use of other illicit drugs and criminal offending. Regular intoxication may interrupt crucial psychosocial development such as identity formation, and interpersonal and occupational skill development. 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 chronic ill health cycle.45 There has been conflicting evidence that cannabis use leads to mental health disorders. Authoritative reviews conclude that cannabis only exacerbates symptoms and precipitates psychotic episodes in vulnerable individuals.44 The most serious long term effect of inhalant abuse is irreversible neurological damage leading to cognitive impairment. Prenatal exposure is associated with low birthweight, prematurity, developmental delays, neurobehavioral problems and physical malformations.46 There is also emerging evidence that substance use is associated with periodontal disease.46 Risk factors for problematic drug use are highlighted in Table 3.2. Factors that reduce the risk of illicit drug use include a high degree of family attachment, effective parental communication and supervision, and religious participation.
### Table 3.2. Risk factors for illicit drug use

<table>
<thead>
<tr>
<th>Individual influences</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Not completing secondary school</td>
</tr>
<tr>
<td>• Unemployment</td>
</tr>
<tr>
<td>• Delinquency</td>
</tr>
<tr>
<td>• Residing in remote and very remote areas</td>
</tr>
<tr>
<td>• Favourable attitudes to drug use</td>
</tr>
<tr>
<td>• Sensation seeking and adventurous personality</td>
</tr>
<tr>
<td>• Relationships with peers involved in drug use</td>
</tr>
<tr>
<td>• Low involvement in activities with adults</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family influences</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Parental conflict</td>
</tr>
<tr>
<td>• Parent-adolescent conflict</td>
</tr>
<tr>
<td>• Parental attitudes to drug use and rules around drug use</td>
</tr>
<tr>
<td>• Alcohol and drug problems in the family</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Community influences</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Perceived and actual level of community drug use</td>
</tr>
<tr>
<td>• Community disadvantage and disorganisation</td>
</tr>
<tr>
<td>• Availability of drugs within the community</td>
</tr>
<tr>
<td>• Positive media portrayal of drug use</td>
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</table>


In the general population, the 2010 National Drug Strategy Household Survey Data found 21.5% of young people aged 14–19 years had ever used cannabis and 15.7% had used in the previous year.40 Youth in this age group are more likely to be recent users of cannabis than recent users of tobacco.47 In the Aboriginal and Torres Strait Islander population cannabis is the most commonly used illicit drug, followed by amphetamines.48 Aboriginal and Torres Strait Islander youth are also more likely than non-Indigenous youth to smoke cannabis. Since the mid 1990s, there has been a rapid and significant increase in cannabis use within some Aboriginal and Torres Strait Islander communities.42 In the 2004–05 National Aboriginal and Torres Strait Islander Health Survey, 23% of non-remote Aboriginal and Torres Strait Islander people aged over 17 years reported using cannabis in the previous 12 months.49 This may in part be due to increased local trafficking, supply reduction measures to combat petrol sniffing and alcohol dependence and the larger context of the consequences of colonisation such as social and cultural alienation, boredom and a perceived lack of a meaningful future.42,50,51 In the general population, approximately 9% of those who ever use cannabis will develop dependence. Risk factors for cannabis dependency in adolescents are earlier age of initiation and frequency of use. There is almost a fivefold 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, shorter duration between first exposure and dependence, and shorter intervals between first and second drug diagnosis.41

Injecting drug use prevalence is comparatively low in young people (0.3% among 14–19 year olds and 0.9% among 20–29 year olds).40 A study commissioned by the Aboriginal Drug and Alcohol Council of South Australia involving an urban Aboriginal population found no significant differences between those over 25 years and those younger than 25 years in terms of drug
use patterns. However, there is still the problem of injecting drug use and the related harm. The report states ‘the implication of this finding is that those under 25 years may have comparatively poorer outcomes in future years compared to their older counterparts’.52 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%).40

Young people aged 14–19 years are more likely than those in other age groups to have used inhalants or volatile substances (prevalence 1.2%) and are more likely to use it frequently (once or more per month).44 Seventy-five percent of inhalant use occurs in a person’s own home or at a friends.53 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. In some Aboriginal and Torres Strait Islander communities, one study found that young people used sniffing as an expression of power (eg. through its ability to provoke outrage and to control body weight through suppressing appetite).45

The inaugural 2010 National Indigenous Drug and Alcohol Conference recommended the following strategies to address the rising prevalence of illicit drug use among Aboriginal and Torres Strait Islander youth:

- include in preventive health and chronic disease agendas for Aboriginal and Torres Strait Islander people a substantial focus and specific funding for addressing substance use
- greater resources to increase the level of ongoing training and capacity of Aboriginal and Torres Strait Islander health workers in the substance use sector
- greater investment for a wider variety of sports and other cultural activities for Aboriginal and Torres Strait Islander youth.54

**Evidence of effectiveness of preventive interventions**

Australia is an international leader in addressing drug related problems with the three-pronged approach of supply reduction, demand reduction and harm reduction/minimisation. This chapter 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.55 (See Chapter 8: Sexual health and bloodborne viruses.)

**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.41 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 psychosocial assessment.51,114 Such assessments can either be done in
a routine manner or opportunistically in young people presenting with respiratory disorders and mental health problems since these are common among cannabis users. Assessment should be done in conjunction with a psychosocial assessment (see psychosocial assessment section).

The following 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. 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. (See 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 over and is included in the Australian Department of Health and Ageing Alcohol treatment guidelines for Indigenous Australians. In July 2009, the Australian Government extended funding for the IRIS program to support a national training rollout. Training is a necessary prerequisite to use of the IRIS tool.

The **Substances and Choices Scale** is a tool developed in New Zealand and validated for use in people aged 13–18 years. 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 (Table 3.2). Prevention programs to prevent initiation of illicit drug use should commence with younger children. 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. 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. Examples include the Multisystemic Treatment and Children at Risk programs in the USA. 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 which form part of the IRIS program are supported and recommended as a culturally validated tool.

**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.60

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.61 Strategies that are devised without community input run the risk of being rejected.62 Successful community engagement strategies include mentorship, encouraging positive school ethos, and youth sport and recreation programs. 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.44 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.63-65

Successful school based drug education programs are those based on social learning theory and which 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.44

There is strong evidence to support needle and syringe exchange programs and supervised injection centres.66–70 (See Chapter 8: Sexual health and bloodborne viruses.)

<p>| Recommendations: Illicit drug use | | | |
|---|---|---|---|---|
| Preventive intervention type | Who is at risk? | What should be done? | How often? | Level/ strength of evidence |
| Immunisation | All young people aged 12–24 years | Review hepatitis B immunisation and immune status and offer vaccination where indicated (see Chapter 8: Sexual health and bloodborne viruses) | As per Australian standard vaccination schedule | GPP 55 |
| Screening | All young people | Assess for presence of risk factors for illicit drug use (see Table 3.2) | As part of an annual health assessment | GPP 1,5,7,11 |
| Behavioural | Young people with risk factors for drug use (see Table 3.2) | Administer one of the following questionnaires to ascertain drug use: CRAFFT screening tool (&lt;21 years) iRIS tool (≥18 years) Substances and Choice scale (13–18 years (see Resources) | Opportunistic | IIIB 1,5,7,11,56–58 |
| | Young people with multiple risk factors for drug use (see Table 3.2) | Refer for preventive case management where services are available* | Opportunistic | IB 44 |
| | Young people who are using illicit drugs | Provide brief interventions (eg, in conjunction with administration of one of the above screening questionnaires). (See also the 5As framework Chapter 1: Lifestyle, introduction) | Opportunistic | IIIB 47,57 |</p>
<table>
<thead>
<tr>
<th>Environmental</th>
<th>N/A</th>
<th>Refer to drug education programs based on social learning theories (eg. life skills program, peer education, youth sport/recreation program)</th>
<th>Opportunistic</th>
<th>IIB</th>
<th>44,61,62</th>
</tr>
</thead>
<tbody>
<tr>
<td>Families of young people who are using illicit drugs</td>
<td>Consider referral where appropriate to parent education programs and family intervention therapy to encourage healthy family development and reduction of parent-adolescent conflict</td>
<td>Opportunistic</td>
<td>IIB</td>
<td>63–65</td>
<td></td>
</tr>
<tr>
<td>Young people who are using injecting drugs</td>
<td>Refer to needle and syringe exchange programs where appropriate</td>
<td>Opportunistic</td>
<td>IIB</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

**Environmental**

- N/A
- Promote school completion
- Promote access to community and school based drug education programs (based on social learning theories)
- Promote youth friendly, primary healthcare services
- Support increased access to youth workers
- Support community driven illicit drug use prevention programs (especially valuable for inhalant abuse)
- Support and promote community engagement strategies such as mentorship
- Support supervised injecting centres

*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 counseling. The approach therefore will involve 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.*

**Resources**

- CRAFFT tool for clinicians
- CRAFFT tool for self administration
- Substances and choices scale manual
- Substances and choices scale questionnaires
  [www.sacsinfo.com/Questionnaires.html](http://www.sacsinfo.com/Questionnaires.html)
- IRIS (Indigenous risk impact screen) tool and brief intervention. The screening tool is made available only after participation in a training workshop
### Appendix 3.1. Stages of adolescent development

<table>
<thead>
<tr>
<th>Central question</th>
<th>Early (10–13 years)</th>
<th>Middle (14–17 years)</th>
<th>Late (18–21 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Am I normal?’</td>
<td>‘Who am I?’</td>
<td>‘Where do I belong?’</td>
<td>‘Where am I going?’</td>
</tr>
</tbody>
</table>

#### Major developmental issues

<table>
<thead>
<tr>
<th>Early</th>
<th>Middle</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coming to terms with puberty</td>
<td>New intellectual powers</td>
<td>Independence from parents</td>
</tr>
<tr>
<td>Struggle for autonomy commences</td>
<td>New sexual drives</td>
<td>Acceptance of sexual identity</td>
</tr>
<tr>
<td>Same-sex peer relationships all important</td>
<td>Experimentation and risk taking</td>
<td>Clear educational and vocational goals, own value system</td>
</tr>
<tr>
<td>Mood swings</td>
<td>Relationships have self centred quality</td>
<td>Developing mutually caring and responsible relationships</td>
</tr>
<tr>
<td></td>
<td>Need for peer group acceptance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emergence of sexual identity</td>
<td></td>
</tr>
</tbody>
</table>

#### Main concerns

<table>
<thead>
<tr>
<th>Early</th>
<th>Middle</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxieties about body shape and changes</td>
<td>Tensions between family and adolescent over independence</td>
<td>Self responsibility</td>
</tr>
<tr>
<td>Comparison with peers</td>
<td>Balancing demands of family and peers</td>
<td>Achieving economic independence</td>
</tr>
<tr>
<td></td>
<td>Prone to fad behaviour and risk taking</td>
<td>Deciding on career/vocation options</td>
</tr>
<tr>
<td></td>
<td>Strong need for privacy</td>
<td>Developing intimate relationships</td>
</tr>
<tr>
<td></td>
<td>Maintaining ethnic identity while striving to fit in with dominant culture</td>
<td></td>
</tr>
</tbody>
</table>

#### Cognitive development

<table>
<thead>
<tr>
<th>Early</th>
<th>Middle</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Still fairly concrete thinkers</td>
<td>Able to think more rationally</td>
<td>Longer attention span</td>
</tr>
<tr>
<td>Less able to understand subtlety</td>
<td>Concerned about individual freedom and rights</td>
<td>Ability to think more abstractly</td>
</tr>
<tr>
<td>Daydreaming common</td>
<td>Able to accept more responsibility for consequences of own behaviour</td>
<td>More able to synthesise information and apply it to themselves</td>
</tr>
<tr>
<td>Difficulty identifying how their immediate behaviour impacts on the future</td>
<td>Begins to take on greater responsibility within family as part of cultural identity</td>
<td>Able to think into the future and anticipate consequences of their actions</td>
</tr>
</tbody>
</table>

### Appendix 3.2. HEEADSSS assessment

<table>
<thead>
<tr>
<th>Assessment area</th>
<th>Suggested questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H – Home</strong></td>
<td>Explore home situation, family life, relationships and stability</td>
</tr>
<tr>
<td></td>
<td>Where do you live? Who lives at home with you?</td>
</tr>
<tr>
<td></td>
<td>Who is in your family (parents, siblings, extended family)?</td>
</tr>
<tr>
<td></td>
<td>What is your/your family’s cultural background?</td>
</tr>
<tr>
<td></td>
<td>What language is spoken at home? Does the family have friends from outside its own cultural group/from the same cultural group?</td>
</tr>
<tr>
<td></td>
<td>Do you have your own room?</td>
</tr>
<tr>
<td></td>
<td>Have there been any recent changes in your family/home recently (eg. moves, departures)?</td>
</tr>
<tr>
<td></td>
<td>How do you get along with mum and dad and other members of your family?</td>
</tr>
<tr>
<td></td>
<td>Are there any fights at home? If so, what do you and/or your family argue about the most?</td>
</tr>
<tr>
<td></td>
<td>Who are you closest to in your family?</td>
</tr>
<tr>
<td></td>
<td>Who could you go to if you needed help with a problem?</td>
</tr>
<tr>
<td><strong>E – Education/Employment</strong></td>
<td>Explore sense of belonging at school/work and relationships with teachers/peers/workmates, changes in performance</td>
</tr>
<tr>
<td></td>
<td>What do you like/not like about school (work)? What are you good at/not good at?</td>
</tr>
<tr>
<td></td>
<td>How do you get along with teachers/other students/workmates?</td>
</tr>
<tr>
<td></td>
<td>How do you usually perform in different subjects?</td>
</tr>
<tr>
<td></td>
<td>What problems do you experience at school/work?</td>
</tr>
<tr>
<td></td>
<td>Some young people experience bullying at school: have you ever had to put up with this?</td>
</tr>
<tr>
<td></td>
<td>What are your goals for future education/employment?</td>
</tr>
<tr>
<td></td>
<td>Any recent changes in education/employment?</td>
</tr>
<tr>
<td><strong>E – Eating/Exercise</strong></td>
<td>Explore how they look after themselves, eating and sleeping patterns</td>
</tr>
<tr>
<td></td>
<td>What do you usually eat for breakfast/lunch/dinner?</td>
</tr>
<tr>
<td></td>
<td>Sometimes when people are stressed they can overeat, or under eat: do you ever find yourself doing either of these?</td>
</tr>
<tr>
<td></td>
<td>Have there been any recent changes in your weight? In your dietary habits?</td>
</tr>
<tr>
<td></td>
<td>What do you like/not like about your body?</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>What do you do for exercise?</td>
</tr>
<tr>
<td></td>
<td>How much exercise do you get in an average day/week?</td>
</tr>
<tr>
<td><strong>A – Activities/peer relations</strong></td>
<td>Explore their social and interpersonal relationships, risk taking behaviour, as well as their attitudes about themselves</td>
</tr>
<tr>
<td></td>
<td>What sort of things do you do in your free time out of school/work?</td>
</tr>
<tr>
<td></td>
<td>What do you like to do for fun?</td>
</tr>
<tr>
<td></td>
<td>Who are your main friends (at school/out of school)?</td>
</tr>
<tr>
<td></td>
<td>Do you have friends from outside your own cultural group/from the same cultural group?</td>
</tr>
<tr>
<td></td>
<td>How do you get on with others your own age?</td>
</tr>
<tr>
<td></td>
<td>How do you think your friends would describe you?</td>
</tr>
<tr>
<td></td>
<td>What are some of the things you like about yourself?</td>
</tr>
<tr>
<td></td>
<td>What sort of things do you like to do with your friends?</td>
</tr>
<tr>
<td></td>
<td>How much television do you watch each night?</td>
</tr>
<tr>
<td></td>
<td>What’s your favourite music?</td>
</tr>
<tr>
<td></td>
<td>Are you involved in sports/hobbies/clubs?</td>
</tr>
</tbody>
</table>
### Appendix 3.2. HEEADSSS assessment (continued)

<table>
<thead>
<tr>
<th>D – Drug use/ cigarettes/alcohol</th>
<th>Explore the context of substance use (if any) and risk taking behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Many young people at your age are starting to experiment with cigarettes/drugs/alcohol. Have any of your friends tried these or other drugs like marijuana, injecting drugs, other substances?</td>
</tr>
<tr>
<td></td>
<td>How about you, have you tried any? If Yes, explore further</td>
</tr>
<tr>
<td></td>
<td>How much do you use and how often?</td>
</tr>
<tr>
<td></td>
<td>How do you (and your friends) take/use them? Explore safe/unsafe use, binge drinking, etc.</td>
</tr>
<tr>
<td></td>
<td>What effects does drug taking or smoking or alcohol have on you?</td>
</tr>
<tr>
<td></td>
<td>Has your use increased recently?</td>
</tr>
<tr>
<td></td>
<td>What sort of things do you (and your friends) do when you take drugs/drink?</td>
</tr>
<tr>
<td></td>
<td>How do you pay for the drugs/alcohol?</td>
</tr>
<tr>
<td></td>
<td>Have you had any problems as a result of your alcohol/drug use (with police, school, family, friends)?</td>
</tr>
<tr>
<td></td>
<td>Do other family members take drugs/drink?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S – Sexuality</th>
<th>Explore their knowledge, understanding, experience, sexual orientation and sexual practices – look for risk taking behaviour/abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Many young people your age become interested in romance and sometimes sexual relationships. Have you been in any romantic relationships or been dating anyone?</td>
</tr>
<tr>
<td></td>
<td>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 or prevent yourself (condoms, contraception)?</td>
</tr>
<tr>
<td></td>
<td>What do you know about contraception and protection against STIs?</td>
</tr>
<tr>
<td></td>
<td>How do you feel about relationships in general or about your own sexual orientation? (For older adolescents) Do you identify yourself as being heterosexual or gay, lesbian, bisexual, transgender or questioning?</td>
</tr>
<tr>
<td></td>
<td>Have you ever felt pressured or uncomfortable about having sex?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S – Suicide/Self harm/ depression/mood</th>
<th>Explore risk of mental health problems, strategies for coping and available support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sometimes when people feel really down they feel like hurting, or even killing themselves. Have you ever felt that way?</td>
</tr>
<tr>
<td></td>
<td>Have you ever deliberately harmed or injured yourself (cutting, burning or putting yourself in unsafe situations eg. unsafe sex)?</td>
</tr>
<tr>
<td></td>
<td>What prevented you from going ahead with it?</td>
</tr>
<tr>
<td></td>
<td>How did you try to harm/kill yourself?</td>
</tr>
<tr>
<td></td>
<td>What happened to you after this?</td>
</tr>
<tr>
<td></td>
<td>What do you do if you are feeling sad, angry or hurt?</td>
</tr>
<tr>
<td></td>
<td>Do you feel sad or down more than usual? How long have you felt that way?</td>
</tr>
<tr>
<td></td>
<td>Have you lost interest in things you usually like?</td>
</tr>
<tr>
<td></td>
<td>How do you feel in yourself at the moment on a scale of 1 to 10?</td>
</tr>
<tr>
<td></td>
<td>Who can you talk to when you’re feeling down?</td>
</tr>
<tr>
<td></td>
<td>How often do you feel this way?</td>
</tr>
<tr>
<td></td>
<td>How well do you usually sleep?</td>
</tr>
<tr>
<td></td>
<td>It’s normal to feel anxious in certain situations – do you ever feel very anxious, nervous or stressed (eg. in social situations)?</td>
</tr>
<tr>
<td></td>
<td>Have you ever felt really anxious all of a sudden – for what particular reason?</td>
</tr>
<tr>
<td></td>
<td>Do you worry about your body or your weight? Do you do things to try and manage your weight (eg. dieting)?</td>
</tr>
<tr>
<td></td>
<td>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?</td>
</tr>
<tr>
<td></td>
<td>Have you ever found yourself feeling really high energy or racey, or feeling like you can take on the whole world?</td>
</tr>
</tbody>
</table>

| S – Safety | Sunscreen protection, immunisation, bullying, abuse, traumatic experiences, risky behaviours |
| S – Spirituality | Beliefs, religion, What helps them relax, escape? What gives them a sense of meaning? |

Sources: Goldenring J, Rosen D 2004 and Sanci L 200114,76
References


63. Centre for Reviews and Dissemination, Parenting programmes for preventing tobacco, alcohol or drugs misuse in children <18: a systematic review (structured abstract). Database of Abstracts of Reviews of Effects serial on the Internet 2011(1).


Chapter 4

Dental health

Author Sandra Meihubers
Expert reviewer Kaye Roberts-Thomson
Overview

Poor 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 considered to be a multifactorial disease, with some of the contributing factors being diet and nutrition (especially high and regular consumption of 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 common medications, particularly antidepressants, antihistamines and antihypertensives
• radiotherapy and chemotherapy for cancers of the head and neck
• Sjögren syndrome
• HIV infection
• diabetes, particularly in people with poor glycaemic control.1,2

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.3 In children, the number of both deciduous (first) and permanent (adult) teeth with caries (i.e. teeth that have past and/or present caries) is about twice the number than in non-Indigenous children. The proportion of untreated dental caries is also higher among Aboriginal and Torres Strait Islander children, which often reflects a lack of access to dental services.4

There is little data on the prevalence of periodontal disease in Aboriginal and Torres Strait Islander populations, however, important general risk factors for periodontal disease include smoking, diabetes, advancing age, stress and poor oral hygiene.5–8 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.9 There is growing evidence to suggest periodontal disease may be associated with cardiovascular disease, stroke and pre-term low birthweight babies, however causal links are yet to be proven, and there is insufficient evidence to show that treatment of periodontal disease can reduce cardiovascular events.10–12

Other major conditions of concern are oral cancer, tooth erosion (wearing away of the hard tissues of the teeth by acids such as those found in acidic foods and drinks, and in bulimic patients), and oral trauma (e.g. through sports injuries). Tobacco smoking and alcohol consumption are risk factors for the development of oral cancer.
Interventions

Recent guidelines on prevention of infective endocarditis recommend antibiotic prophylaxis prior to dental procedures in Aboriginal and Torres Strait Islander people with rheumatic heart disease 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 regular checks and guidance, is more effective in reducing the risk of infective endocarditis.

Since dental caries is considered to be a bacterial infection, the improvement in oral health of a pregnant woman would lower the risk of transmitting harmful oral bacteria to a newborn. During pregnancy there may also be a greater risk of tooth erosion from nausea and vomiting, and progression of periodontal disease. Standard preventive measures such as drinking fluoridated water, twice daily use of fluoride containing toothpaste and minimising sugar consumption are advised. The use of fluoride supplements is not recommended in pregnancy as there is no evidence of its effectiveness.
## Recommendations: Dental health

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children aged 0–5 years</td>
<td>Recommend regular review with a dental health professional</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IVC 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People aged 6–18 years</td>
<td>Non-dental health professionals are encouraged to undertake an oral health review including the assessment of teeth, gums and oral mucosa as part of a regular health assessment (see Table 4.1)</td>
<td>Annually</td>
<td>IVC 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults with poor oral health and/or risk factors for dental disease (see Table 4.2)</td>
<td></td>
<td>Annually</td>
<td>IVC 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People with diabetes, immunosuppression, haematological conditions, bleeding disorders or anticoagulant therapy</td>
<td></td>
<td>At first antenatal visit (see Chapter 9: Antenatal care)</td>
<td>IVC 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All pregnant women</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults with good oral health</td>
<td></td>
<td></td>
<td>2 yearly</td>
<td>IVC 18</td>
<td></td>
</tr>
<tr>
<td>Those with past history of rheumatic heart disease and cardiovascular abnormalities</td>
<td>Refer to a dental professional and undertake an oral health review as part of a regular health assessment (see Table 4.1) with appropriate oral hygiene advice to minimise oral bacterial levels</td>
<td>6–12 monthly</td>
<td>IVC 13,19,20</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children aged 0–5 years</td>
<td>Recommend use of fluoride containing toothpaste at least once daily, from the time the teeth start to erupt</td>
<td>Opportunistic</td>
<td>IA 17,21–23</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Use a smear of paste for children under 2 years and a pea-size amount for children 2+ years. Toothpaste with a fluoride concentration of 1000 ppm is recommended unless there is a risk of fluorosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children aged 0–5 years where families have evidence of dental caries, poor oral hygiene</td>
<td>Refer to dental professional for regular application of fluoride varnish</td>
<td>At least every 6 months from when the teeth erupt, and for a period of not less than 24 months</td>
<td>IB 23,24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People aged &gt;5 years at high risk of dental caries (see Table 4.2)</td>
<td>Refer to dental professional for regular application of fluoride varnish</td>
<td>2–4 times per year for professional application</td>
<td>IA 25,26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Recommendations: Dental health (continued)

| 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. See management guidelines for specific advice | Opportunistic | GPP | 13,14 |

Environmental  Communities  Advocate for fluoridation of community water supply  1A  16

Table 4.1. Advice for good oral health practices

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 health professionals

Assessment
Visual inspection of teeth for evidence of caries, periodontal disease, assessment of maternal caries and/or poor oral hygiene
Assess oral hygiene practices, consumption of sucrose and sweetened drinks especially in baby bottles, ‘honey on the dummy’ or other sweet substances such as glycerine on the dummy, 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 between meal snacks and drinks
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

Source: The RACGP 2009

Table 4.2. Risk factors for dental disease

- Poor oral hygiene practices (eg. no/irregular toothbrushing, use of hard toothbrush, no use of fluoride toothpaste, incorrect brushing technique)
- Poor diet and nutrition (eg. high and regular consumption of sucrose and carbohydrate containing foods and drinks, especially black cola, sweetened fizzy drinks)
- Salivary composition and flow: if poor then 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, particularly antidepressants, antihistamines and antihypertensives; radiotherapy and chemotherapy for cancers of the head and neck; Sjögren syndrome; 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
- HIV infection can also contribute to a greater risk of periodontal disease, oral ulceration and cancer
- Other modifying risk factors can include age, socioeconomic status and access to oral health services
Resources

Lift the lip and see my smile brochures (NSW Government)

Information pamphlets for oral health and smoking, erosion, diabetes, pregnancy (Dental Practice Education Research Unit)
www.arcpoh.adelaide.edu.au/dperu/special/

General oral health promotion information (various sources)
www.healthinfonet.ecu.edu.au/health-resources/promotion-resources
www.adaq.com.au
www.dhsv.org.au/oral-health-resources/guides-and-resources/
www.adelaide.edu.au/oral-health-promotion/

Learning modules on oral health for health professionals (Smiles for Life)

References


Chapter 5

Rheumatic heart disease

Author Nicolette de Zoete
Expert reviewer Jonathan Carapetis
Overview

Rheumatic heart disease (RHD) is caused by long term damage to the heart muscle or heart valves as a result of acute rheumatic fever (ARF). Acute rheumatic fever is a delayed autoimmune response to a throat infection caused by Group A streptococcus (GAS) bacteria, which results in an illness that mainly affects the heart, joints, brain and skin. An aetiologic link between GAS skin infections and acute rheumatic fever has also been proposed, but further research is needed to substantiate this. In 2012, Rheumatic Heart Disease Australia published the most up-to-date prevention and management guideline for RHD. In this guideline the Australian criteria for ARF diagnosis have been revised and are shown in Table 5.1. The major changes from previous guidelines include:

- the ability to diagnose a recurrence of ARF in a patient from a high risk group who has only one major plus one minor manifestation, provided that other, more likely diagnoses are excluded
- the inclusion of mono-arthritis as a minor manifestation in patients from high-risk groups
- fever can be considered a minor manifestation based on a reliable history (in the absence of documented temperature) if anti-inflammatory medication has already been administered
- the ability to diagnose probable ARF (level C), so as to include patients who do not satisfy the criteria for definite ARF, but in whom the clinician feels that ARF is the most likely diagnosis.
### Table 5.1. Australian guideline criteria for acute rheumatic fever

<table>
<thead>
<tr>
<th></th>
<th>High risk groups*</th>
<th>All other groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial episode of ARF</strong></td>
<td>Two major or one major and two minor manifestations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plus Evidence of a preceding GAS infection†</td>
<td></td>
</tr>
<tr>
<td><strong>Recurrent attack of ARF in a patient with known past ARF or RHD</strong></td>
<td>2 major or 1 major and 1 minor or 3 minor manifestations</td>
<td>Plus Evidence of a preceding GAS infection†</td>
</tr>
<tr>
<td><strong>Probable ARF (first episode or recurrence)</strong></td>
<td>A clinical presentation that falls short by either 1 major or 1 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:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• highly suspected ARF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• uncertain ARF</td>
<td></td>
</tr>
<tr>
<td><strong>Major manifestations</strong></td>
<td>Carditis (including evidence of rheumatic valvulitis on echocardiogram)</td>
<td>Carditis (excluding subclinical evidence of rheumatic valve disease on echocardiogram)</td>
</tr>
<tr>
<td></td>
<td>Polyarthritis or aseptic mono-arthritis or polyarthralgia‡</td>
<td>Polyarthritis‡</td>
</tr>
<tr>
<td></td>
<td>Chorea§</td>
<td>Chorea§</td>
</tr>
<tr>
<td></td>
<td>Erythema marginatum#</td>
<td>Erythema marginatum</td>
</tr>
<tr>
<td></td>
<td>Subcutaneous nodules</td>
<td>Subcutaneous nodules</td>
</tr>
<tr>
<td><strong>Minor manifestations</strong></td>
<td>Mono-articulargia</td>
<td>Fever ≥38°C¶</td>
</tr>
<tr>
<td></td>
<td>Fever ≥38°C¶</td>
<td>ESR ≥30 mm/hr or CRP ≥30 mg/L</td>
</tr>
<tr>
<td></td>
<td>ESR ≥30 mm/hr or CRP ≥30 mg/L</td>
<td>Prolonged P-R interval on ECG**</td>
</tr>
<tr>
<td></td>
<td>Prolonged P-R interval on ECG**</td>
<td></td>
</tr>
</tbody>
</table>

ARF = acute rheumatic fever, CRP = C-reactive protein, ECG = electrocardiogram, ESR = erythrocyte sedimentation rate, GAS = group A streptococcus infection, RHD = rheumatic heart disease

* High risk groups are those living in communities with high rates of ARF (incidence >30 per 100 000 per year in those aged 5–14 years) or RHD (all-age prevalence >2 per 1000). Aboriginal and Torres Strait Islander people living in rural or remote settings are known to be at high risk

† Elevated or rising antistreptolysin O or other streptococcal antibody, or a positive throat culture or rapid antigen test for GAS

‡ A history of arthritis is sufficient to satisfy this manifestation. Other causes of arthritis/arthralgia should be carefully excluded

§ Rheumatic (Sydenham) 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

Source: Rheumatic Heart Disease Australia 2012

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**Table 5.1. Australian guideline criteria for acute rheumatic fever**

**High risk groups**

- Two major or one major and two minor manifestations
- Plus Evidence of a preceding GAS infection†

**All other groups**

#### Initial episode of ARF

- Two major or one major and two minor manifestations
- Plus Evidence of a preceding GAS infection†

#### Recurrent attack of ARF in a patient with known past ARF or RHD

- 2 major or 1 major and 1 minor or 3 minor manifestations
- Plus Evidence of a preceding GAS infection†

#### Probable ARF (first episode or recurrence)

- A clinical presentation that falls short by either 1 major or 1 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

#### Minor manifestations

- Mono-articulargia
- Fever ≥38°C¶
- ESR ≥30 mm/hr or CRP ≥30 mg/L
- Prolonged P-R interval on ECG**

ARF = acute rheumatic fever, CRP = C-reactive protein, ECG = electrocardiogram, ESR = erythrocyte sedimentation rate, GAS = group A streptococcus infection, RHD = rheumatic heart disease

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** 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

Source: Rheumatic Heart Disease Australia 2012
Individuals with ARF are generally quite unwell, in significant pain from arthritis or arthralgia. They may require hospitalisation. Although acute episodes can be quite dramatic, ARF is not known to cause lasting damage to the brain, joints or skin (although there is some emerging evidence to suggest that chorea is sometimes associated with long term cognitive or behavioural disturbances). By contrast, damage to the heart, or more specifically the mitral and/or aortic valves, may remain once the acute episode has resolved. RHD is the most common cause of heart disease in children worldwide and is an important cause of preventable premature mortality. It is also where the greatest disparity between Aboriginal and Torres Strait Islander and non-Indigenous cardiovascular mortality exists, with the death rates in Aboriginal and Torres Strait Islander males and females being 15.1 and 23 times greater, respectively, than non-Indigenous males and females.4

Both ARF and RHD are important and preventable causes of ill health and death. They are typically associated with overcrowding, poor sanitary conditions and other aspects of socioeconomic disadvantage.5 ARF and RHD are rare in developed counties, but in Australia they are highly prevalent among Aboriginal and Torres Strait Islander people living in rural and remote areas, particularly in northern Australia. Data obtained from the Northern Territory’s RHD control program show that [in the Northern Territory] 92% of people with RHD are Aboriginal and/or Torres Strait Islander and of these 85% live in remote communities and towns. Since 2000, the prevalence rate of RHD has continued to increase, with almost 2% of the Aboriginal and Torres Strait Islander population in the Northern Territory being affected, 3.2% of whom are aged 35–44 years. The incidence of ARF remains highest in people aged 5–14 years, ranging from 150 to 380 per 100,000.6

GAS accounts for 15–30% of all cases of pharyngitis in children between the ages of 5 and 15 years, and approximately 10% of adults with sore throats.7 In a small group of susceptible people (3–5% of the population), GAS throat infections lead to ARF and acute poststreptococcal glomerulonephritis.8 Acute poststreptococcal glomerulonephritis can also be caused by impetigo due to GAS (‘nephritogenic strains’). While outbreaks of acute poststreptococcal glomerulonephritis can occur warranting mass chemoprophylaxis of contacts, rheumatic fever outbreaks have not been described in Aboriginal and Torres Strait Islander communities, so mass chemoprophylaxis has no role in the primary prevention of ARF at a community level.5

However, it appears that Aboriginal children in the Top End of the Northern Territory have a low throat carriage of GAS (1–3%) and symptomatic pharyngitis is rare in this population.9 In these children it appears that impetigo is the most common manifestation of GAS disease and more specifically, infection secondary to scabies infection appears to be a major contributor.

This has led to the hypothesis that pyoderma (bacterial infection of the skin), as the major manifestation of GAS infection, has a significant role in the development of ARF. In one Australian study, up to 50% of pyodermas were caused by superinfected scabies. Community based programs aimed at eradicating scabies in these endemic regions may impact on the incidence of ARF and resulting morbidity and mortality due to RHD, although this has not been proven.10,11

Treating pharyngitis in high risk populations with appropriate antibiotics has been shown to reduce the rate of acute otitis media and quinsy and to prevent individual cases of ARF that would result following symptomatic GAS
The preferred recommended treatment of streptococcal throat infection is intramuscular benzathine penicillin G (BPG). Oral phenoxymethyl penicillin for 10 days is a second line alternative as BPG is known to be more effective and lead to better adherence rates.

Addressing other socioeconomic factors that may contribute to the spread of GAS in the community, such as household overcrowding, is also likely to reduce the incidence of ARF.

The risk of ARF after the first attack of GAS pharyngitis is approximately 0.3–3%, but with subsequent infection in someone who has already had ARF this risk rises to 25–75%. In addition, those who suffer carditis during their initial attack are significantly more likely to develop further carditis with subsequent streptococcal throat infections. Forty percent of people newly diagnosed with RHD in northern Australia have not been previously diagnosed with ARF, which suggests that improvements in early detection are needed.

Early detection of RHD, combined with secondary prophylaxis, is the key to minimising the severity of valvular lesions. Echocardiography has been demonstrated to be superior to auscultation in detecting subclinical RHD in high risk populations, however, the optimal screening strategy remains to be confirmed. In 2011, the World Heart Federation developed a standardised and evidence based criteria for the echocardiographic diagnosis of RHD (Table 5.2). For people aged ≤20 years, two categories, ‘definite RHD’ and ‘borderline RHD’, are included to identify individuals in high risk populations who may not have had time to develop the full echocardiographic manifestations of RHD.
Table 5.2. World Heart Federation criteria for echocardiographic diagnosis of rheumatic heart disease

<table>
<thead>
<tr>
<th>1. Echocardiographic criteria for individuals ≤20 years of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definite RHD (either A, B, C or D)</td>
</tr>
<tr>
<td>A. Pathological MR* and at least 2 morphological features of RHD of the mitral valve†</td>
</tr>
<tr>
<td>B. MS mean gradient ≥4 mmHg (must exclude congenital mitral valve anomalies)</td>
</tr>
<tr>
<td>C. Pathological AR‡ and at least 2 morphological features of RHD of the aortic valve§ (must exclude bicuspid aortic valve and dilated aortic root)</td>
</tr>
<tr>
<td>D. Borderline disease of both aortic and mitral valve#</td>
</tr>
<tr>
<td>Borderline RHD (either A, B or C) (in high risk populations only)</td>
</tr>
<tr>
<td>A. At least two morphological features of RHD of the mitral valve† without pathological MR or MS</td>
</tr>
<tr>
<td>B. Pathological MR*</td>
</tr>
<tr>
<td>C. Pathological AR‡</td>
</tr>
<tr>
<td>Normal echocardiographic findings (all of A, B, C and D)</td>
</tr>
<tr>
<td>A. MR that does not meet all four Doppler criteria (physiological MR)*</td>
</tr>
<tr>
<td>B. AR that does not meet all four Doppler criteria (physiological AR)‡</td>
</tr>
<tr>
<td>C. An isolated morphological feature of RHD of the mitral valve (eg. valvular thickening), without any associated pathological stenosis or regurgitation</td>
</tr>
<tr>
<td>D. Morphological features of RHD of the aortic valve§ (eg. valvular thickening), without any associated pathological stenosis or regurgitation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Echocardiographic criteria for individuals &gt;20 years of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definite RHD (either A, B, C or D)</td>
</tr>
<tr>
<td>A. Pathological MR* and at least 2 morphological features of RHD of the mitral valve†</td>
</tr>
<tr>
<td>B. MS mean gradient ≥4 mmHg (must exclude congenital mitral valve anomalies)</td>
</tr>
<tr>
<td>C. Pathological AR‡ and at least two morphological features of RHD of the aortic valve§ (must exclude bicuspid aortic valve and dilated aortic root)</td>
</tr>
<tr>
<td>D. Pathological AR‡ and at least two morphological features of RHD of the mitral valve†</td>
</tr>
</tbody>
</table>

AR = aortic regurgitation, MR = mitral regurgitation, MS = mitral stenosis, RHD = rheumatic heart disease

* Pathological MR is defined as meeting all four of the following doppler criteria: (A) seen in 2 views; (B) in at least one view, jet length 2 cm; (C) peak velocity ≥3 m/s; (D) pan-systolic jet in at least one envelope

† Morphological features of RHD in the mitral valve: anterior mitral valve leaflet thickening ≥3 mm (age specific), chordal thickening, restricted leaflet motion, excessive leaflet tip motion during systole

‡ Pathological aortic regurgitation is defined as meeting all four of the following doppler criteria: (A) seen in 2 views; (B) in at least one view, jet length 2 cm; (C) peak velocity ≥3 m/s; (D) pan-systolic jet in at least one envelope

§ Morphological features of RHD in the aortic valve: irregular or focal thickening, coaptation defect, restricted leaflet motion, prolapse

# Combined AR and MR in high prevalence regions and in the absence of congenital heart disease is regarded as rheumatic

Source: Rheumatic Heart Disease Australia 2012

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

Rheumatic heart disease
Although these new, standardised criteria will greatly contribute to improved diagnosis of RHD, questions remain about the role of echocardiography in screening programs. Echocardiography based screening may lead to overdiagnosis, which will require careful review to exclude RHD and avoid unnecessary treatment. A recent study in New Zealand, using portable echocardiograms and cardiology assessment to screen 1142 (predominately high risk) children aged 10–13 years, found high rates of undetected RHD. It also showed that echocardiography alone overestimated the prevalence of RHD, as it did not distinguish underlying congenital and physiological changes from RHD. A population based survey in four sites across the north of Australia has been undertaken to determine the prevalence of RHD among Aboriginal, Torres Strait Islander and non-Indigenous children by screening children aged 5–14 years for RHD and is due to report in 2012. This study should help to determine the most sensitive and specific screening method for RHD and hopefully this information with help guide future screening programs. Until these results are published, it is not recommended that current screening programs be changed.

The severity of, and morbidity due to, RHD can be significantly reduced by secondary prophylaxis. Intramuscular BPG is beneficial in the prevention of recurrent ARF. It is superior to oral penicillin in the reduction of both recurrent ARF (87–96% reduction) and streptococcal pharyngitis (71–91% reduction). High levels of medication adherence are associated with regression of heart disease in approximately 50–70% of people. It is recommended that the duration of secondary prophylaxis be based on the patient’s age and time since last episode of ARF and that echocardiography be performed prior to stopping it. For individuals with probable ARF that is categorised as ‘highly suspected’ (Table 5.1), it is recommended that prophylaxis be continued for a minimum of 10 years after the most recent suspected episode of ARF or until another diagnosis is made. For those with ‘uncertain ARF’ it is recommended they continue prophylaxis for 12 months after diagnosis and then reassess. If there is no evidence of RHD then consider ceasing prophylaxis, otherwise manage as per RHD severity. For individuals with a history of ARF and no or mild RHD, prophylaxis is continued for a minimum of 10 years since last episode of ARF or age 21 (whichever is longer). For those with moderate RHD it is continued for a minimum of 10 years or until age 35 (whichever is longer) and for those with severe RHD it is continued for a minimum of 10 years or until age 40 (whichever is longer).

The fundamental goal in long term management of chronic RHD is to prevent the need for valve surgery. Penicillin secondary prophylaxis (for prevention of recurrent ARF) is crucial to achieving this. When adherence with penicillin prophylaxis is low, there is greater need for surgical intervention and long term surgical outcomes are not as good. The specific valvular lesions of RHD are beyond the scope of this chapter, but many patients (eg. 47% of RHD patients in the Top End of the Northern Territory) will have involvement of two or more valves, most commonly mitral and aortic, although pathology in one is usually dominant. The assessment of severity of each valvular lesion is made by echocardiography as well as clinical review. Echocardiographic surveillance in individuals with a history of ARF and RHD is an important part of ongoing management with the frequency dependant on the severity of the RHD. It is also recommended that high risk individuals with murmurs suggestive of RHD are assessed with echocardiography.
Coordinated control programs are the most effective approach to improving BPG adherence and clinical follow up of people with RHD and for promoting primary prevention of ARF. They enable the provision of education and training for healthcare providers and education and health promotion for individuals, families and the community. A key component of these programs is local registers of people with RHD or a history of ARF. These can assist with routine assessment and surveillance and recording of prophylaxis delivery and recall of patients. Centralised registers (jurisdictional or national level) can support the provision of prophylaxis for those who move between communities. Not only do they help increase adherence to secondary prophylaxis, and ultimately reduce the need for valve surgery, but registers improve case detection, reduce recurrences of ARF and decrease hospitalisations from ARF/RHD. In 2009, Rheumatic Health Disease Australia was established as the national coordination unit to support the control of RHD in Australia (see Resources). There are now a number of national RHD control programs in the Top End of the Northern Territory, central Australia, far northern Queensland and the Kimberley in Western Australia.

As part of coordinated control programs, the 2012 Rheumatic Heart Disease Australia guideline recommends that a structured care plan should be used for all individuals with a history of ARF or with established RHD and that this care plan be based on a priority classification. Priority classifications 1–3 replace the previous categories of severe, moderate and mild RHD respectively and are outlined in Table 5.3.

As for all patients with chronic disease, routine dental care is also important in patients with a history of ARF and/or RHD. All patients should receive education about oral hygiene, and should be referred promptly for dental assessment and treatment when required. This is especially important prior to valvular surgery (indications of which are beyond the scope of this chapter), when all oral/dental pathology should be investigated and treated accordingly. As infective endocarditis is a dangerous complication of RHD; it is recommended in the Australian antibiotic therapeutic guidelines that additional antibiotic prophylaxis be given prior to dental or surgical procedures for all patients with established RHD. Individuals with a history of ARF but no valvular damage do not require antibiotic prophylaxis. Although this has not been proven, its use is supported by animal models of endocarditis and empirical observations that have demonstrated a reduction in bacteraemia.
### Recommendations: Rheumatic heart disease

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening</td>
<td>All people</td>
<td>Recommend auscultation of the heart to assess for previously undiagnosed RHD. Echocardiography is not currently recommended to screen for previously undiagnosed RHD.</td>
<td>Opportunistic and as part of an annual health assessment.</td>
<td>GPP 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All people with a past history of ARF or murmurs suggestive of valve disease</td>
<td>Referral for echocardiography and subsequent follow up is recommended. See management guidelines for specific advice.</td>
<td>As per management guidelines 3</td>
<td>GPP 3</td>
<td></td>
</tr>
<tr>
<td>Behavioural</td>
<td>People with a past history of ARF or RHD</td>
<td>Advise that the rate for recurrence of ARF is 50% and that there is a need for prophylactic antibiotics (see below)</td>
<td>Opportunistic GPP 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommend dental hygiene, and regular review (see Chapter 4: Dental health)</td>
<td>6–12 monthly GPP 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemoprophylaxis</td>
<td>All people in high risk communities where GAS infections are common and ARF is prevalent</td>
<td>Any sore throat should be treated as if it is a GAS pharyngitis infection with a single intramuscular benzathine penicillin injection (preferred) or 10 days of oral penicillin (see specific management guidelines) Where possible this should be based on confirmation with a throat swab culture</td>
<td>Opportunistic GPP 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All people with GAS pharyngitis</td>
<td>Treat with 10 days of oral penicillin or a single intramuscular benzathine penicillin injection (see specific management guidelines) There is no need to treat family contacts of those with GAS pharyngitis</td>
<td>Opportunistic IA 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All people with ARF/RHD</td>
<td>Identify patients for secondary antibiotic prophylaxis through inclusion in local recall systems and centralised rheumatic fever register where one exists</td>
<td>Opportunistic GPP 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Categorise patients according to their priority status (see Table 5.3) and implement a tailored secondary prevention strategy (see management guidelines for priority specific recommendations)</td>
<td>As per individual recall plan IA 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Recommendations: Rheumatic heart disease (continued)

| Environmental | Communities where GAS infections are common and ARF is prevalent | Assess for overcrowding and refer to social support services for housing assistance if indicated (see Chapter 7: Hearing loss) If high rates of impetigo and underlying scabies, consider community healthy skin program (see Chapter 2: Child health) | N/A | IIIB | 19 |

*Echocardiography is likely to be a superior strategy to auscultation and lead to improved case detection of subclinical RHD. The optimal echocardiography based screening strategy, however, is the subject of ongoing research and until the outcomes of this research is known routine echocardiography screening is not recommended (see preamble for more details)*

Table 5.3. Priority classifications for developing management plans

<table>
<thead>
<tr>
<th>Classification</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority 1 (severe)</td>
<td>Any of the following: severe valvular disease, moderate/severe valvular lesion with symptoms, mechanical prosthetic valves, tissue prosthetic valves and valve repairs including balloon valvuloplasty</td>
</tr>
<tr>
<td>Priority 2 (moderate)</td>
<td>Any moderate valve lesion in the absence of symptoms and with normal LV function</td>
</tr>
<tr>
<td>Priority 3 (mild)</td>
<td>ARF with no evidence of RHD or trivial to mild valvular disease</td>
</tr>
<tr>
<td>Priority 4 (inactive)</td>
<td>Patients with a history of ARF (no RHD) for whom secondary prophylaxis has been ceased</td>
</tr>
</tbody>
</table>

Source: Rheumatic Heart Disease Australia 2012

Resources

Updated Australian guidelines for diagnosis and management of ARF and RHD (Rheumatic Heart Disease Australia)
www.rhdaustralia.org.au

Rheumatic heart disease: all but forgotten. A 60 minute program outlining strategies for the treatment, control and eradication of ARF and RHD (Rural Health Education Foundation)
References


3. Rheumatic Heart Disease Australia (ARF/RHD writing group), National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand. Australian guideline for prevention, diagnosis and management of acute rheumatic fever and rheumatic heart disease, 2nd edn. RHD Australia, 2012 (in press).


Chapter 6

Eye health
Visual acuity

Background

Good eye health is critical to quality of life. Impaired vision, which is defined as a visual acuity (VA) <6/12,1 often goes unrecognised and contributes significantly to morbidity.2 Visual impairment is a risk factor for falls.3 In the elderly, untreated cataracts increase the risk of multiple falls,4 social isolation and depression.5 The 2009 National Indigenous Eye Health Survey included a sample of Aboriginal and Torres Strait Islander adults in urban, regional and remote settings.1 The age adjusted prevalence of low vision was 8.6%, 2.8 times higher than rates for non-Indigenous adults. Low vision prevalence is higher in remote and very remote areas, ranging from 9.5–12.7%. The sampling adjusted prevalence of blindness (VA <6/60 in the better eye, and/or combined both eyes visual field of less than 10 degrees – in normal sighted people this is 170 degrees6) was 1.8%. The major causes of blindness are cataract (32%), optic atrophy (14%), refractive error (14%), diabetes (9%) and trachoma (9%).1 The rate of blindness was 6.2 times higher than in non-Indigenous Australians.

The dominant cause of low vision is refractive error (54%) with prevalence rates around five times higher than for non-Indigenous adults. Over a third of National Indigenous Eye Health Survey participants (39%) could not read normal size print, and 62% reported they normally wore reading glasses for near-work (eg. reading, sewing). Other important causes of low vision include cataract 27% and diabetic retinopathy (12%).

Risk factors for cataract include ocular exposure to ultraviolet light,7,8 diabetes and poor diabetic control,9 and smoking. In a recent Australian study, ‘ever smokers’ had a 41% increased risk of developing nuclear cataract compared to never smokers.10 Reduction of ocular sun exposure with sunglasses may assist. Although exposure to sunlight accounts for only 10% of cataracts in an urban non-tropical Australian population,7 this risk factor may be more important in northern Australian populations.

The National Indigenous Eye Health Survey found 37.4% of Aboriginal and Torres Strait Islander adults reported having diabetes with a similar prevalence across all the regions sampled. Of these, 12% had low vision and only 20% reported an eye examination in the past 12 months. A total of 2.5% had proliferative retinopathy, 0.4% severe non-proliferative retinopathy, and 25% mild/moderate non-proliferative retinopathy. Of these, only 39% had received some laser treatment.1 Although diabetes is a risk factor for cataract there is no robust evidence that improved diabetic treatment prevents or delays lens opacity.11

Evidence for the effectiveness of preventive interventions

Recommendations for the school based screening of visual acuity in children in non-trachoma endemic areas lack a research base for evidence of effectiveness. An Australian based expert group suggests screening for age problems on at least three occasions: birth and 3–6 months, both to pick up serious congenital conditions; and screening at 4 years to check visual acuity and refer if either eye is worse than 6/9, or if there is a two-line difference in results for both eyes.12
Visual acuity screening is advocated in older adults because refractive errors are correctable with eyeglasses and have good outcomes with refractive surgery if available. The US Preventive Services Task Force concludes that there is insufficient evidence to assess benefits and harms of screening for visual acuity in adults over 65 years of age. However, given the substantially higher prevalence of low vision in Aboriginal and Torres Strait Islander communities, there is a reasonable justification for visual acuity screening at younger ages. Vision assessments are components of Medicare health assessments for all age groups. The CARPA standard treatment manual recommends visual acuity screening in Aboriginal and Torres Strait Islander populations aged 50 years or more, while the Queensland chronic disease guidelines recommend screening as part of Aboriginal and Torres Strait Islander health assessments from 40 years.

The Snellen eye chart is a highly sensitive and specific recommended screening test for visual acuity testing and is more sensitive than screening questions. The E-test visual acuity charts for near and distance vision are useful for people who cannot read and were used routinely in the National Indigenous Eye Health Survey. However, of even greater importance is the need to test near or ‘reading’ vision, especially in those aged over 40 years. The National Indigenous Eye Health Survey found that 40% of Aboriginal and Torres Strait Islander adults could not see normal sized print. Near vision test cards or any printed matter can be used to test near vision and E-tests for near vision can also be used for people who cannot read.

Cataract surgery has been shown to improve vision and quality of life. It has also been associated with fewer vehicle accidents after cataract surgery. The National Indigenous Eye Health Survey found evidence of disparities in access to cataract surgery, with only 65% of Aboriginal and Torres Strait Islander adults with vision loss from cataract having received surgery with more remote people having less operations, compared with 89% of non-Indigenous adults. One study showed an increased risk of death in those not having cataract surgery. A case record audit in the Northern Territory found cataract surgery had a beneficial effect on visual acuity and quality of life for Aboriginal and Torres Strait Islander people. While most people in this cohort were legally blind, surgery should be performed when visual acuity is worse than 6/12 or when patient function is impaired, although there are questions in the urban Australian context about patient selection for cataract surgery to maximise good outcomes.

For people with diabetes, an annual visual acuity assessment and dilated fundus/retinal camera examination by a trained examiner is recommended for routine diabetic retinopathy screening. Early laser photocoagulation treatment can prevent progression and save sight. In fact 98% of the blindness due to diabetes can be prevented and yet only 20% of those with diabetes had had the required annual eye examination in the National Indigenous Eye Health Survey. Good glycaemic, lipid and blood pressure control and early treatment of any diabetic retinopathy remain the cornerstone of primary prevention and delay of progression of diabetic retinopathy.
## Recommendations: Visual acuity

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>Infants aged &lt;6 months</td>
<td>Conduct a general eye examination. Refer if red eye reflex absent or other abnormality found</td>
<td>As part of a newborn and 3–6 month health assessment</td>
<td>GPP</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Children aged 4–5 years</td>
<td>Screen for visual acuity (VA) (use E chart if required) Refer if VA is less than 6/9 or there is a two line difference between eyes</td>
<td>Opportunistic and once only at routine health assessment</td>
<td>GPP</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>All adults aged &gt;40 years People with poor near-vision (presbyopia)</td>
<td>Near and far visual acuity assessment is recommended to detect visual loss due to presbyopia or cataract The use of near test material and Snellen chart (and E chart if required) is recommended for testing visual acuity If unable to see normal sized print (type) refer to optometrist or ophthalmologist for assessment and probable reading glasses</td>
<td>Annually as part of an adult health assessment</td>
<td>GPP</td>
<td>15–17,27</td>
</tr>
<tr>
<td></td>
<td>People with cataract</td>
<td>If visual acuity is worse than 6/12 or when function is impaired refer to an ophthalmologist for assessment and possible cataract surgery</td>
<td>Opportunistic</td>
<td>GPP</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>People with diabetes</td>
<td>Undertake visual acuity and retinal assessment by trained assessor as indicated in diabetic management guidelines Retinal photography by trained primary care staff combined with external review by an ophthalmologist is a useful strategy for comprehensive screening</td>
<td>Annually</td>
<td>IA</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>GPP</td>
<td>26,28</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>Current smokers</td>
<td>Advise smoking cessation to reduce the risk of developing cataracts (see Chapter 1: Lifestyle, section on smoking)</td>
<td>Opportunistic</td>
<td>IIIIC</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>All people</td>
<td>Recommend reduced ocular exposure to UV-B light to reduce risk of cataract (eg. wearing sunglasses)</td>
<td>Opportunistic</td>
<td>IIIIC</td>
<td>7,8</td>
</tr>
</tbody>
</table>
Trachoma and trichiasis

Background
Trachoma is a bacterial eye disease of poor socioeconomic conditions, including overcrowding and poor water/sewerage services. Active trachoma (usually graded as TF: trachoma follicular) predominantly affects young children and is a contagious infection of the eye by specific, non-genital strains of the bacterium *Chlamydia trachomatis*. Multiple infections cause conjunctival scarring (TS: trachomatous scarring) leading to eyelid contraction and in-turned margin (entropion) over decades (TT: trachomatous trichiasis). The resulting inturned eyelashes rub on the eyeball causing painful corneal scarring and opacity (CO: corneal opacity).

Trichiasis occurs when at least one eyelash rubs on the eyeball, or there is evidence of recently removed eyelashes because of eyelash inturning. If not treated with surgery to the eyelid to correct inturned eyelashes, corneal scarring can end in blindness in later adult life, 20–40 years after the initial trachoma infections. Australia is the only developed country in the world that still has areas of trachoma and trichiasis. These occur almost exclusively in remote Aboriginal populations in the Northern Territory, South Australia and Western Australia. The National Indigenous Eye Health Survey found that the overall rate of active trachoma (TF: trachoma follicular) in children under 5 years is 3.8%. There was a steep rise in prevalence from urban and remote (0.6–1.6%) to very remote regions (7.3%), where 50% of communities had endemic rates (>5%) of active trachoma. Within communities trachoma is strongly clustered by households and within households clustered by sleeping rooms, suggesting continued transmission depends on close prolonged contact.

From the National Indigenous Eye Health Survey, the community prevalence rates of trachomatous scarring ranged from 0% to 53% (overall 15.7%), trichiasis prevalence from 0% to 14.6% (overall 1.4%) and corneal opacity from 0% to 3.3% (overall 0.3%). These data show that blinding endemic trachoma remains a major public health problem in very remote communities and given the long delay in onset, scarring and blindness will persist for decades after trachoma is eliminated.

Evidence of the effectiveness of preventive interventions
The Communicable Disease Network of Australia Guidelines for the public health management of trachoma in Australia, 2006, are based on the World Health Organization (WHO) SAFE strategy. The acronym SAFE encompasses an integrated approach to prevention including Surgery for trichiasis, Antibiotics to reduce community reservoirs of trachoma infection, Facial cleanliness in preschool children, and Environmental measures to reduce trachoma transmission. There is good evidence to support all SAFE strategy components. Chlamydia vaccine development has been flagged as a possible complementary strategy to SAFE, but is currently many years away.

With rapid household spread and high mobility of families in remote areas, trachoma control and prevention is best undertaken at regional levels with coordination of screening and mass treatment. 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). Environmental strategies such as improved water access, access to toilets, waste and fly control, and reduced household overcrowding also play a key role in trachoma control.34

The diagnosis of trachoma is based on clinical grounds. Laboratory tests are not recommended, except perhaps to exclude other bacterial infection.36 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. There is evidence of effectiveness for these larger scale community treatment programs, with a single dose of azithromycin at 20 mg/kg orally up to 1 g repeated at least annually.37

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. Unfortunately, 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.38 In trachoma endemic areas (ie. where active trachoma prevalence in children under 10 years is >5%) annual screening programs are indicated. WHO does not recommend a particular season for screening and treatment. Even within very remote regions there may be variation in trachoma prevalence in both place and time, due to population mobility and environmental factors, but instability of prevalence estimates are usually due to small survey numbers, variable screening coverage and remote clinical staff screening skill. The Australian guidelines recommend annual screening until reductions in prevalence to <5% are sustained for over 5 years.34

In areas where trachoma and trichiasis is endemic, adults aged 40–54 years should be screened every 2 years, and those aged 55+ should be screened annually for trichiasis, for example as part of an annual health assessment.34,39 The ‘3Ts’ need to be remembered for the trichiasis examination: Think to do it, use a Thumb to lift the lid so the lashes lift away from the eye, and use a Torch to provide enough light to see the dark lashes. Blindness due to trichiasis is irreversible once it has occurred but progression to blindness can be temporarily halted by surgery, because it stops eyelash rubbing and therefore prevents corneal opacity.40 Surgery however does not alter the natural history of trichiasis; therefore, post surgery, patients who still have vision should be followed up annually to screen for recurrence.41 Other trichiasis complications such as dry eyes need symptomatic treatment to prevent further complications.
### Recommendations: Eye health

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>People living where trachoma is endemic (&gt;5% prevalence of active trachoma in young children)</td>
<td>Implement a community screening program in partnership with regional population health units to assess the prevalence of active trachoma. No community screening is required where prevalence is below 5% of children for 5 consecutive years.</td>
<td>As per national guideline recommendations (see Resources)</td>
<td>GPP 34</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adults aged &gt;40 years raised in trachoma endemic area</td>
<td>Perform eye examination to ascertain corneal scarring and/or the presence of trichiasis. Those with trichiasis,* refer to an ophthalmologist for surgery.</td>
<td>2 yearly (age 40–54 years) Annually (age 55+ years)</td>
<td>N/A</td>
<td>IIIB 40,41</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All children from trachoma endemic areas</td>
<td>Recommend to families the importance of the following in the prevention and control of trachoma:  - facial cleanliness of children  - effective rubbish disposal and other fly control measures  - regular screening, and treatment of infection</td>
<td>Opportunistic and as part of an annual child health assessment</td>
<td>IIB</td>
<td></td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>People living where trachoma is endemic (&gt;5% prevalence of active trachoma in young children)</td>
<td>Treat case and all household contacts using community based single dose azithromycin (A) on an annual basis.</td>
<td>As per state and territory protocols</td>
<td>IA 37</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>All people</td>
<td>Assess housing situation for overcrowding and refer to social support services for housing assistance if indicated. (See Chapter 7: Hearing loss)</td>
<td>N/A</td>
<td>GPP 34</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remote communities</td>
<td>Implement joint health promotion strategies with state/territory government public health units and local shire councils for fly control strategies and other environmental health standards.</td>
<td>As per state/territory government plans</td>
<td>GPP 34</td>
<td></td>
</tr>
</tbody>
</table>

* 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.\(^{30}\)
Resources

Full report on National Indigenous Eye Health Survey

Australian guidelines for the management of diabetic retinopathy (NHMRC)

Patient factsheets on diabetic retinopathy (CERA)

Guidelines for the public health management of trachoma in Australia (Australian Government)

At cost vision screening kits including E-test charts, which are suitable for primary care including remote use (CERA)

Grading card showing the simplified trachoma grading system, which includes high quality clinical pictures of trachoma and trichiasis (2-sided), available free (WHO)
www.who.int/blindness/publications/trachoma_english.jpg

Comprehensive practical documents including control program, surgery and community support guides (WHO)

References


Overview

The National Guide provides recommendations on the primary prevention of otitis media as a cause of hearing loss, and the early detection of hearing loss predominantly for children aged less than 15 years with some recommendations pertaining to Aboriginal and Torres Strait Islander adults. The diagnosis and management of otitis media and hearing loss is outside the scope of this guide, as other sources of advice are available.\textsuperscript{1,2}

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. Chronic otitis media such as otitis media with effusion and chronic suppurative otitis media are highly prevalent in rural and remote Aboriginal communities. These infections occur predominantly in Aboriginal children and cause hearing loss during the critical period of child development, although some effects may be lifelong. Otitis media is managed at a rate of 4 times for every 100 consultations in Aboriginal Community Controlled Health Services. In comparison, acute otitis media is less commonly managed in private general practice (1.2 per 100 encounters 2004–05) where over 98% of patients were non-Indigenous.\textsuperscript{3}

Other guidelines

This National Guide has cross referenced recommendations in this section with the 2011 evidence based Recommendations for clinical care guidelines on the management of otitis media.\textsuperscript{2}

Adults

Few recent studies have examined the extent of hearing impairment in Aboriginal and Torres Strait Islander adults. A 2006 cross sectional analysis of at least 50% of the adult Aboriginal prisoner population in Victoria showed no difference in the prevalence value for 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).\textsuperscript{4} Overall, self reported rates of hearing problems/ear diseases were 12% (across all ages) in the National Aboriginal and Torres Strait Islander Health Survey (2004–05), consistent with reporting by non-Indigenous people in the National Health Survey (13%). However, self reported rates of Aboriginal people’s hearing problems/ear disease were higher than the non-Aboriginal population for all ages, except for the population aged over 55 years of age.\textsuperscript{5}

Other guidelines

The 7th edition of the RACGP Guidelines for preventive activities in general practice recommends annual questioning about hearing impairment for Australians aged 65 years and over (B) and references the US Preventive Services Task Force (1995) and Canadian Task Force (1995).\textsuperscript{6} In 1996, the US task force recommended ‘screening older adults for hearing impairment by periodically questioning them about their hearing, counselling them about the availability of hearing aid devices, and making referrals for abnormalities when appropriate (B recommendation)’. In 2011, the US task force could not ascertain the benefits of screening and treatment for hearing loss in older adults (>50 years) and recommended more research. The review aimed to determine if screening for hearing loss in asymptomatic adults (>50 years) lead to improved health outcomes. However, it found that hearing ‘screening was not associated with any differences in hearing-related quality of life compared with no screening’\textsuperscript{7}. 
Preventive interventions

Immunisation

Antenatal and childhood infections
Congenital and acquired hearing loss can be prevented by immunisation (rubella, measles, Hib, pneumococcus, meningococcus) by implementing the National Immunisation Schedule (and variations within state and territories) from birth/infancy. See Chapter 2 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.8 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 2007.9 It is unclear what proportion have congenital hearing loss as a consequence. Screening antenates for syphilis is a key part of prevention of the disease (see Chapter 9: Antenatal care).

Pneumococcal
Pneumococcal conjugate vaccine (PCV) given to children will prevent a proportion from developing acute otitis media, but is not the primary reason for recommending it. The primary indication for PCV in the National Immunisation Program Schedule is for the prevention of invasive pneumococcal disease and pneumonia.

Systematic review of randomised controlled trials for the prevention of acute otitis media using 7-valent PCV (with CRM197-mutated diphtheria toxin carrier protein) shows marginal (7%) reduction but may mean ‘substantial reductions from a public health perspective’ in infant children.10 Protein D (Haemophilus influenzae derived) conjugated pneumococcal vaccine (11-valent) has 34% efficacy in reducing acute otitis media due to action against acute otitis media from both pneumococcus and non-typable H. influenzae.11

Observational studies show reduced outpatient visits (20%) for acute and chronic otitis media from PCV.12 Other studies show reduced incidence of recurrent otitis media from PCV13,14 and reduced incidence of pressure equalising tube insertions from conjugate pneumococcal vaccination.13–15

In contrast, 23-valent polysaccharide pneumococcal vaccine (23vPPV) has not been shown to prevent otitis media.

13-valent PCV was approved by the US Food and Drugs Administration in 2010 for the prevention of invasive pneumococcal disease as well as otitis media caused by the seven serotypes also covered by 7-valent PCV, however, ‘no efficacy data for prevention of otitis media are available for the six additional serotypes’.16

10-valent PCV (protein D conjugate: Synflorix®) was Therapeutic Goods Administration approved in Australia in July 2009 as an alternative to 7-valent PCV for the prevention of childhood pneumococcal infections (including invasive disease, pneumonia and acute otitis media). 13-valent PCV was approved by the Advisory Committee on Prescription Medicines in 2010,17 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 acute otitis media) in infants and children from 6 weeks up to 5 years of age’. The vaccine is not Therapeutic Goods Administration approved for the prevention of otitis media due to non-typable H. influenzae.

This indication was approved by the Therapeutic Goods Administration in May 2010, and announced by the Federal Minister for Health in February 2011. It took effect from 1 April 2011 on the Pharmaceutical Benefits Scheme (PBS).
Influenza

Influenza vaccination in children will prevent a proportion from developing acute otitis media, but is not the primary reason for recommending it. The efficacy of inactivated influenza vaccine in the prevention of acute otitis media is inconclusive.

The National Immunisation Program Schedule recommends influenza vaccine for the prevention of influenza and pneumonia. All the influenza vaccines currently available in Australia are either split virion or subunit vaccines prepared from purified inactivated influenza virus which has been cultivated in embryonated hens’ eggs. The use of influenza vaccine for the prevention of otitis media is not subsidised under the Australian National Immunisation Program Schedule.

A 2005 systematic review showed influenza vaccination was no different from placebo. A 2007 meta-analysis showed a 51% reduction in acute otitis media overall (with 32% reduction in acute otitis media using inactivated influenza vaccine in children). Recently, influenza vaccination (inactivated trivalent virosomal adjuvanted) was effective in relative reduction of acute otitis media episodes (6 month follow up) by 34% compared with unvaccinated controls (in children prone to recurrent otitis media). Episodes of acute otitis media were reduced by 71% in a randomised controlled trial involving children aged 18–72 months receiving inactivated trivalent influenza vaccine. However, ‘outside of the influenza seasons, no significant effects of vaccinations were demonstrated on the studied outcomes’.

Pooled data from randomised controlled trials of children receiving live attenuated influenza vaccine (aged 6–83 months) showed a 38% relative reduction in the development of acute otitis media.

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 early in life. Neonatal hearing screening is believed to have resulted in significant cost savings to the health system. Australia operates neonatal screening programs in all states/territories to varying degree as some offer universal hearing screening and others offer targeted screening (many other countries also have a universal newborn hearing screening program).

In 2009, the Council of Australian Governments agreed to ensure that by the end of 2010 every child born in Australia has access to screening for congenital hearing impairments. This program is being coordinated at the federal level with states and territories, although there is no specific federal funding for this now national approach to newborn hearing screening. Guidelines and standards have been endorsed by the Australian Health Ministers’ Advisory Council and performance indicators for the monitoring of the program are in development. A formal evaluation of cost:benefit has not been proposed (pers. comm. Department of Health and Ageing, July 2011).

Permanent congenital hearing loss (PCHL) occurs in 1–2 infants per 1000 births. Prevalence of PCHL is significantly higher than prevalence of other conditions for
which newborn screening currently occurs (eg. phenylketonuria 1 per 10 000; hypothyroidism 3 per 10 000; cystic fibrosis 4 per 10 000). Newborn hearing screening leads to earlier identification and intervention, and ultimately leads to better language development. In the absence of newborn hearing screening, three out of 4 children with PCHL remain undiagnosed by 12 months of age and their capacity for normal language and cognitive development is greatly diminished.

In Western Australia, Newborn Hearing Screening (NBHS) services have operated in selected metropolitan hospitals since 2000. From 2010, all West Australian birthing hospitals will be required to screen all newborns for permanent congenital hearing loss. In 2011, it was reported that more than 95% of all newborns in Western Australia had received neonatal hearing screening. Few data are available from other jurisdictions.

Several systematic reviews have examined universal newborn hearing screening. The United States Preventive Services Task Force recommends screening for hearing loss in all newborn infants before 1 month of age. Infants who do not pass the newborn screening should undergo audiologic and medical evaluation before 3 months of age. This is based on good quality evidence that early detection improves language outcomes, although the net benefit (taking account of risk of harms) is moderate. The number needed to screen to diagnose one case is 878 and 178 for universal newborn hearing screening and targeted screening programs, respectively.

A Cochrane review of randomised controlled trials concluded that the long term effectiveness of universal newborn hearing screening programs has not been established. The review could not identify any randomised trials comparing the long term results (psychological, language and educational related outcomes) of either universal, targeted or opportunistic newborn hearing screening programs.

Another systematic review concurred 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.

Early childhood

Specific recommendations for the Aboriginal and Torres Strait Islander population for hearing screening from early childhood are based on the high incidence and prevalence of otitis media in the Aboriginal population. Screening for otitis media with effusion in non-Indigenous children is not recommended by general guidelines (eg. the RACGP red book).

The Senate Community Affairs Reference Committee has recommended that ‘the Council of Australian Governments extends its commitment for universal newborn hearing screening to include a hearing screening of all children on commencement of their first year of compulsory schooling. Given the crisis in ear health among Aboriginal and Torres Strait Islander people, the committee believes urgent priority should be given to hearing screenings and follow up for all Indigenous children from remote communities on commencement of school.

However, according to the Darwin Otitis Guideline Group, in regions with near-universal conductive hearing loss due to infection (intermittent/recurrent), it is unlikely that hearing screening at school entry will reveal information that isn’t already known. In regions with sporadic hearing loss, monitoring for hearing
loss is the preferred recommendation. School entry screening might pick up undetected deafness (usually otitis media with effusion) warranting personal intervention, but it is unclear if this outcome justifies school entry screening. The Darwin Otitis Guideline Group did not recommend school entry screening for hearing loss detection in populations with high levels (‘near universal’) of otitis media and consequent conductive hearing loss. The group recommended that ‘regular surveillance (with appropriate testing when indicated) is preferred to school entry screening’.

In a cross-sectional analysis over time, 19% of Aboriginal children screened at school age screening program had unilateral/bilateral mild–moderate hearing loss.31 There was no cohort or comparison group of non-Indigenous children, so it is not possible to assess this significance of this level. This is the only recent school screening report in Australia.

The US Preventive Services Task Force provides no recommendations for hearing screening beyond those for the neonatal period. The American Academy of Pediatrics recommends hearing screening at 4 years, and definitive hearing testing at intervals in those children with risk factors (eg. recurrent otitis media). No specific reference is made to school screening.

**Behavioural**

Parental vigilance for the detection of hearing loss in children is crucial. Around one-quarter of hearing loss affected children had their loss identified and initiated by parental suspicion.32,33 Other sources of identification include well-baby checks (20%) and through risk factors (31%).32

Studies report parents are poor predictors of hearing loss from otitis media with effusion.34,35

**Breastfeeding**

A meta-analysis of observational studies found that prolonged breastfeeding for at least 3 months reduces the risk of acute otitis media by 13%.36 A cohort study found 6 month exclusive breastfeeding protective against infectious disease.37

**Smoking**

Exposure to passive smoke is confirmed risk factor in cohort studies38 and meta-analysis of those studies.39 Evidence that smoking cessation favourably influences the progression of otitis media with effusion is lacking.

**Swimming**

The Norwegian Mother and Child Cohort Study conducted by the Norwegian Institute of Public Health in children born between 1999 and 2005 followed from birth to the age of 18 months. Children who were baby swimming (at 6 months) were not more likely to have lower respiratory tract infections, to wheeze or to have otitis media.40

Two meta-analyses of randomised controlled trials and cohort studies have investigated the impact of swimming on acute otitis media occurrence (or otorrhoea) after tympanostomy tube insertion. They both found that swimming made no difference to the occurrence of acute otitis media (or otorrhoea).41,42

Children with chronic suppurative otitis media who swim may also benefit, as the introduction of swimming pools in two remote Aboriginal communities led to a reduction in the prevalence of tympanic membrane perforations over 18 months,43 although this was not a controlled trial.
Antibiotics
A Cochrane review of 13 randomised controlled trials found long term (>6 weeks) prophylactic antibiotics can prevent episodes of acute otitis media, but children in the trials mostly had recurrent otitis media.44 A meta-analysis showed that while oral antibiotics used in acute otitis media had a marginal effect in preventing asymptomatic middle ear effusion, this benefit was outweighed by other factors such as antibiotic resistance and treatment to prevent effusion could not be warranted.45

There is little evidence that acute otitis media can be prevented by commencing treatment with antibiotics at the onset of upper respiratory tract symptoms or as prophylaxis generally (as distinct from prophylaxis in children with known recurrent otitis media, which is effective).46

Management of detected otitis media should proceed according to clinical practice guidelines, which are distinct for the Aboriginal population.1

Prophylactic antiviral drugs
It has been reported that acute otitis media occurs in 20–50% of children under 6 years of age after influenza.47 Acute otitis media was significantly less likely in patients with confirmed influenza infection treated with neuraminidase inhibitors versus placebo.48

Another systematic review examined the effect of antiviral drugs on the secondary effects of influenza (such as acute otitis media) as well as preventing influenza in family contacts of the index case: ‘Effects of neuraminidase inhibitors on rates of otitis media were no different in children aged 5–6 and 12 but were significantly lower in children younger than 5 years. With a household prophylaxis strategy, 13 children would need to be treated with a 10 day course of zanamivir or oseltamivir to prevent one additional child developing influenza … Reductions of secondary complications could be an important factor in the decision to treat and should be balanced with the higher rates of adverse effects, particularly vomiting, with oseltamivir’.47

It appears therefore that in children affected with influenza, there is the option of antiviral therapy to prevent acute otitis media (while considering the number needed to treat to prevent one case of acute otitis media) or antibiotics when/if acute otitis media develops. In conclusion, there is little rationale in opting for neuraminidase inhibitors to prevent the need for antibiotic treatment for acute otitis media as a complication of influenza.

Housing
Early and persistent otitis media could be prevented if overcrowded living conditions of Aboriginal communities were improved.49 A strong independent association was demonstrated between ‘reports of respiratory infection’ and the overall ‘functional condition’ of those houses examined over 2003–04. Statistically significant associations were found between carers’ report of the presence of ear infections in children with the level of toilet infrastructure and poor infrastructure overall. The study confirms ‘the potential for general improvements in the functional state of housing infrastructure to improve the health of children in these communities, most notably through reducing respiratory infections’.49

Overcrowded housing has also been shown to increase the risk of nasopharyngeal carriage of *Streptococcus pneumoniae*, *Moraxella catarrhalis* and non-typeable *H. influenzae* in Aboriginal and non-Aboriginal children.
Nasopharyngeal carriage of these pathogens is a well established predictor of early onset acute otitis media and chronic otitis complications. Overcrowded housing facilitates household transmission of otitis pathogens.\textsuperscript{50}

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 (needing more bedrooms).\textsuperscript{51}

**Handwashing**

Few studies have evaluated the effects of handwashing, nose-blowing and facial cleanliness on the prevention of acute otitis media.

A randomised controlled study examining handwashing in child day care centres found that children in the intervention group had fewer visits to a doctor because of an attack of acute otitis media with effusion and received 24% fewer prescriptions for anti-microbials. There was general compliance with the handwashing instructions.\textsuperscript{52}

Regarding the prevention of the pathogens that transmit acute otitis media, poor handwashing was a predictor of non-typable *H. influenzae* throat carriage in children from child care centres.\textsuperscript{53} The risk of pneumococcal hand contamination was eight times higher in Aboriginal children aged 3–7 years from a remote community than in children younger than 4 years of age from urban childcare centres (37% vs 4%), further supporting the important role of handwashing in the prevention of otitis media.\textsuperscript{54}

**Noise induced hearing loss**

It is likely that in many Aboriginal families, noise exposure exceeds the allowable daily exposure of 85 decibels (dBA) averaged over an 8 hour working day (occupational standards), according to a recent survey conducted mostly in the Northern Territory. Overcrowding is likely to contribute to excessive noise exposure. A significant risk of noise induced hearing loss is believed to occur in the majority of persons exposed to levels which exceed this on a long term basis. Such exposure may create ‘a “second wave” of preventable noise-induced sensori-neural hearing loss for those in Indigenous communities’.

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, particularly for children with a history of ear disease.\textsuperscript{55}

Few studies have explored the prevalence of noise related hearing disorders affecting Aboriginal people. 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 percent had reported exposures to loud noise.\textsuperscript{4}
### Recommendations: Hearing loss

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immunisation</strong></td>
<td>Children aged &lt;15 years</td>
<td>Vaccination is recommended to prevent infections that may lead to congenital or acquired hearing loss (rubella, measles, <em>H. influenzae</em> type b, meningococcus). (See Chapter 2: Child health)</td>
<td>As per National Immunisation Program Schedule (NIPS) and state/territory schedules</td>
<td>IA</td>
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<td>Pneumococcal conjugate vaccination (13-valent PCV) is recommended during infancy to prevent invasive disease, pneumonia and acute otitis media.</td>
<td>Age 2, 4 and 6 months, as per NIPS and state/territory schedules</td>
<td>I–IIA</td>
<td>10,11</td>
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<td>Annual influenza vaccination (inactivated virus) is recommended for any person ≥6 months of age who wishes to reduce the likelihood of becoming ill with influenza. Vaccination may reduce the incidence of acute otitis media as a secondary complication of influenza</td>
<td>As per NIPS and state/territory schedules</td>
<td>IC</td>
<td>19,20,23</td>
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<tr>
<td></td>
<td>All pregnant women</td>
<td>Offer testing for rubella immunity and syphilis serology to prevent infections which may lead to congenital hearing loss</td>
<td>See Chapter 9: Antenatal care</td>
<td>N/A</td>
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<td>Recommendations: Hearing loss (continued)</td>
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<td>aware of the universal neonatal hearing</td>
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<td>screening program being implemented in</td>
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<td>newborn screened for congenital hearing</td>
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<td>Encourage parents to be aware of child</td>
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<td>developmental milestones in the early</td>
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<td>detection of hearing loss (see Table 7.1).</td>
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<td>Parental suspicion of hearing loss should</td>
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<td>always be investigated (see Table 7.2).</td>
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<td>Where relevant, provide advice regarding</td>
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<td>free hearing assessment (see below)</td>
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<td>Conduct ear examinations (otoscopy) in</td>
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<td>order to detect unrecognised acute</td>
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<td>or chronic otitis media. If detected,</td>
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<td>children at high risk of hearing</td>
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<td>impairment†</td>
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<td>Monitor for hearing loss</td>
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<td>Use the following audiological tools to</td>
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<td>monitor for hearing loss: simplified</td>
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<td>and pneumatic otoscopy or tympanometry</td>
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<td>These methods do not assess hearing</td>
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<td>used to identify otitis media with effusion</td>
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<td>(with possible conductive hearing loss).</td>
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<td>The routine hearing screening of all</td>
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<td>questioning, provide advice regarding</td>
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<td>free hearing assessment, and make</td>
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<td><strong>All people</strong></td>
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<td>Inform patients that free hearing</td>
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<td>assessment (and rehabilitation/hearing</td>
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<td>aids if hearing loss is confirmed) can</td>
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<td>be obtained as part of the Australian</td>
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<td>Government Hearing Services Program and</td>
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<td>the Community Services Obligation</td>
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</table>
### Behavioural

**Pregnant women and postnatal period**
Promote exclusive breastfeeding for at least 4 months (and preferably to 6 months) to reduce the risk of infants acquiring acute otitis media. Refer women to breastfeeding support programs if needed.

Opportunistic, antenatal and postnatal checks, and as part of an annual health assessment

**IB** 36

**All smokers**
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. (See Chapter 1: Lifestyle, section on smoking cessation)

Opportunistic and as part of an annual health assessment

**IA** 39

**All people**
Swimming (sea, clean fresh water) should be permitted including in children with a prior history of otitis media (all forms)

Opportunistic

**IA** 40–43

**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

### Chemo-prophylaxis

**Children aged <15 years**
The use of prophylactic antibiotics in order to prevent the onset of acute otitis media is not recommended, except in children with recurrent otitis media.

Opportunistic

**IA** 42,43

The use of prophylactic antiviral drugs in those with confirmed influenza for the purpose of preventing the onset of acute otitis media is not recommended

Opportunistic

**IA** 39,48

### 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 (see Table 7.3)

Annually

**IIIC** 39,49,50

Encourage nose-blowing, facial cleanliness and handwashing of children, in order to prevent the transmission of infectious disease. Frequent hand washing in child care centres can prevent the occurrence of childhood infections and episodes of acute otitis media

Opportunistic

**IIC** 52,53

**All people**
Inform families of the danger of loud noise (and for prolonged periods), especially for children with a history of ear disease (see Resources)

Opportunistic

**GPP** 55

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* Aboriginal and Torres Strait Islander children in high risk areas are recommended to also receive 23-valent polysaccharide vaccine (PSV) 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. This vaccine is not recommended for children in New South Wales, the Australian Capital Territory, Victoria or Tasmania.

† High risk of hearing impairment: those from socioeconomically deprived communities and from regions with a high prevalence of otitis media

‡ Australian Government Hearing Services Program eligibility (Voucher system) includes all Australian pensioner/sickness allowance recipients 21 years and older including a dependent of a person in that category. For those under 21 years, certain remote area patients, adults with complex hearing needs, Aboriginal and Torres Strait Islander persons >50 years of age or Aboriginal participants in CDEP programs of any age, the Community Services Obligation component also provides free hearing services and can be accessed by the federally funded and sole provider of these services: ‘Australian Hearing’. The CSO can also be accessed by those aged 21–26 years.

§ Recurrent otitis media: the occurrence of three or more episodes of acute otitis media in a 6 month period, or occurrence of four or more episodes in the past 12 months.
Table 7.1. Hearing related growth milestones in children

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
- 9 months: poor feeding or oral coordination
- 12 months: not babbling
- 20 months: only pointing or using gestures (i.e., not speaking)
- 24 months: using <20 words, not following simple requests
- 30 months: no two-word combinations

Source: Darwin Otitis Guideline Group 2010

Table 7.2. Criteria for referral of children with suspected hearing loss, hearing related problems elicited through simplified parental questionnaires (Table 7.1), and/or caregiver concerns

<table>
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<tr>
<th>Age of child</th>
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<tr>
<td>&lt;3 years</td>
<td>Major regional hearing centre to determine the level of loss</td>
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<td>&lt;5 years and older children at high risk of hearing impairment*</td>
<td>Paediatrician and audiologist for appropriate developmental assessment and hearing tests</td>
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<tr>
<td>&lt;15 years</td>
<td>Audiologist or ENT specialist for full hearing assessment</td>
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</table>

* High risk of hearing impairment refers to people from socioeconomically deprived communities and from regions with a high prevalence of otitis media

Source: Darwin Otitis Guideline Group 2010

Table 7.3. Definition of overcrowded housing circumstances

Households that do not meet the following requirements are deemed to be overcrowded:

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

Source: Biddle N 2008
Resources
Recommendations for clinical care guidelines on the management of otitis media in Aboriginal and Torres Strait Islander populations (Darwin Otitis Guideline Group in collaboration with the Office for Aboriginal and Torres Strait Islander Health Otitis Media Technical Advisory Group)

Therapeutic Guidelines: Antibiotics
www.tg.org.au/?sectionid=41

Noise destroys your hearing (Australian Hearing)

References


Chapter 8

Sexual health and bloodborne viruses

Author Gabrielle Hall
Expert reviewers Steven Skov, James Ward
Overview

Sexually transmissible infections (STIs) and bloodborne viruses (BBVs) are seldom diagnosed from symptomatic presentation. The majority of STIs in Australia are diagnosed in primary care as opposed to specialised sexual health clinics. In contrast to sexual health clinic settings, patients in a primary care setting infrequently present requesting a sexual health check. In this scenario it is necessary for the health worker to realise an opportunity for opportunistic screening. This guide should assist in deciding which tests to include in screening and help recognise the high risk patient and offer screening at every appropriate opportunity. Every state and territory in Australia has a public health department that can advise clinicians on current prevalence data and any increased risks in their region.

The teenage pregnancy rate (women under 20 years age) in 2006 in Australia was five times higher for Aboriginal and Torres Strait Islander women compared to non-Indigenous women. The peak age group for births to Aboriginal and Torres Strait Islander women was 20–24 years of age, compared to 30–34 years for non-Indigenous women. In the period 2001–04, 23% of Aboriginal and Torres Strait Islander women who gave birth were younger than 20 years of age. Only 4% of non-Indigenous women were aged under 20 years. This reminds us that prevention and screening for STIs and appropriate vaccination are vital for healthy pregnancies and need to start early for Aboriginal and Torres Strait Islander adolescents. Counselling during the screening process should include discussions about contraception and family planning.

There are widely varying prevalence rates for STIs within Australia and a variation from community to community within the states and territories. Factors such as poverty, discrimination, substance abuse, illicit drug use and recent incarceration all affect sexual behaviours. Table 8.1 highlights the common risk factors for STIs and BBVs. In Aboriginal and Torres Strait Islander populations and non-Indigenous populations, 80% of notifications occur in the 15–29 years age group. Notification rates of STIs are generally increasing in Australia, although disease incidence and prevalence have been difficult to estimate reliably. The data for Aboriginal and Torres Strait Islander populations are inconsistent, largely due to under identification of Aboriginal or Torres Strait Islander status. There have been improvements in data collection, notification systems and diagnostic techniques that make it difficult to compare trend data. The most current data are from the 2011 Australian Annual Surveillance for Notifiable STIs. National STI incidence comparing Aboriginal and Torres Strait Islander rates to that of the non-Indigenous population were:

- 1257 vs 340 per 100 000 population for chlamydia infection
- 804 vs 30 per 100 000 population for gonorrhoea
- 25 vs 6 per 100 000 population for syphilis.

Queensland defied the national trend of a decline in the rate of syphilis (notably in the Northern Territory, South Australia and Victoria) with an increase in the Aboriginal and Torres Strait Islander rate to 35 per 100 000. The incidence rates for Aboriginal and Torres Strait Islander people when compared with non-Indigenous populations for newly acquired virus were:

- stable at 5 vs 1 per 100 000 population for hepatitis B virus (HBV) infection
• 141 vs 48 per 100 000 population for hepatitis C virus (HCV) infection
• 4.2 vs 4.1 per 100 000 population for human immunodeficiency virus (HIV) infection.

The Genital Wart Surveillance Network reported a decline in diagnoses of genital warts in female Australian women eligible for the HPV vaccine (aged 12–26 years in 2007) from 10.9% of first time uses of a sexual health service in 2004 to 4.8% in 2009.6

The 2011 Bloodborne Viral and Sexually Transmissible Infections in Aboriginal and Torres Strait Islander people: Surveillance and Evaluation report shows the widely varying prevalence rates from state-to-state and between major cities, regional areas, and rural and remote regions.7 For chlamydia the rate of diagnosis was highest in Northern Territory and Western Australia and lowest in Tasmania and Victoria with South Australia rates falling between these regions. Queensland and New South Wales are not included as Aboriginal and Torres Strait Islander status is reported for less than 50% of the diagnoses. Twice as many remote and very remote diagnoses of chlamydia were made compared with major cities and outer regional areas. Inner regional areas have the lowest rate of diagnosis of chlamydia for Aboriginal and Torres Strait Islander people.7

Chlamydia

Chlamydia trachomatis of immunotypes D–K is the most commonly diagnosed STI and there has been a significant increase in notification rates since 1997.8 Asymptomatic infection is common in both sexes. In men, chlamydia commonly causes urethritis and can also cause epididymitis, infertility and Reiter syndrome. In women, chlamydia can cause cervicitis with the risk of developing salpingitis and pelvic inflammatory disease or chronic pelvic pain. Chlamydia is efficiently transmitted vertically at birth and can cause conjunctivitis, pneumonia and otitis media. Chlamydia is an important cause of tubal factor infertility and ectopic pregnancy, so early testing for chlamydia prior to reproductive age and during pregnancy is most important. Despite the need for early testing, a 2008 ecological study of chlamydia testing data (71 295 tests) and Victorian chlamydia notification data (7006 notifications) concluded that testing in the age groups at most risk, ie. women aged between 20 and 24 years, was low even in those living in the most advantaged quartile.9 Early treatment of infections can prevent complications and is effective. The immediate dose of azithromycin currently recommended for chlamydia treatment is highly effective.10

Gonorrhoea

Gonorrhoea is a purulent infection of mucous membranes caused by Neisseria gonorrhoeae. It causes urethral symptoms in up to 50% of men and is largely asymptomatic in women. In men it causes urethritis, proctitis, epididymitis and prostatitis. In women it is a major cause of cervicitis and pelvic inflammatory disease and this can lead to chronic pelvic pain, infertility and ectopic pregnancy. Infection during pregnancy can cause adverse outcomes and perinatal transmission can cause gonococcal conjunctivitis. In adults, gonococcal septic arthritis is a known presentation and in both sexes there can be symptomatic pharyngitis. Gonococcal infection appears to increase susceptibility to, and transmission of, HIV.
Trichomoniasis

Trichomonas is a sexually transmissible protozoal parasite that causes vaginal discharge, however the majority of cases in high prevalence areas are asymptomatic. The consequences of trichomoniasis are potentially important in pregnant women in whom infection is associated with premature rupture of the membranes and pre-term delivery however, treatment of asymptomatic infection has not been shown to reduce these complications (see Chapter 9: Antenatal care). It has also been associated with an increase in the acquisition of HIV. It is associated with low economic status, injecting drug use and no Pap test screening, which probably reflects lack of access to healthcare or poor health seeking behaviours. It is a notifiable disease in the Northern Territory where case notification rates are similar to those for chlamydia. Trichomonas is not a notifiable disease elsewhere in Australia.

Syphilis

Syphilis is a bacterial STI caused by the spirochaete Treponema pallidum. Syphilis is spread by direct sexual contact and most cases presents as asymptomatic. Early syphilis is defined as the stages of syphilis (primary, secondary and early latent syphilis) that typically occur within the first year after acquisition of the infection. Latent syphilis is characterised by asymptomatic infection with a normal physical examination in association with a positive serology. Latent syphilis is categorised as ‘early’ or ‘late’ depending on the established date of infection. Early latent syphilis implies infection within 1 year. All other cases are referred to as late latent syphilis or latent syphilis of unknown duration. The primary stage of syphilis is usually marked by a lesion called a ‘chancre’, that appears 7–90 days after exposure. Weeks to a few months later, approximately 25% of individuals with untreated infection will develop a systemic illness that represents secondary syphilis, which commonly presents as a maculopapular rash on the palms of the hands and the soles of the feet. The secondary stage typically resolves spontaneously in 2–6 weeks but can recur repeatedly during the first 2 years. Following the secondary phase there is an asymptomatic latent stage that can be diagnosed by a positive specific treponemal antibody test. In the early latent syphilis phase the disease is considered contagious. In late latent syphilis it is not considered contagious. Tertiary or late syphilis occurs in an uncertain proportion of patients infected by T. pallidum and refers to symptomatic manifestations of the disease involving the central nervous system, the cardiovascular system, or the skin and subcutaneous tissues (gummas).

Treatment of syphilis in pregnant women is important to prevent congenital syphilis of the newborn. The rate of diagnosis of infectious syphilis was on a decline to 25 per 100 000 in Aboriginal and Torres Strait Islander populations in 2009, whereas the rate in the non-Indigenous population rose to 6 per 100 000 in 2009. Despite the decline, Aboriginal and Torres Strait Islander rates are many times higher than other Indigenous and non-Indigenous populations in high income countries. In Queensland, syphilis persists in Aboriginal and Torres Strait Islander populations at high levels of up to 52 cases per 100 000 population compared to non-Indigenous rate of 2 cases per 100 000 population. The decrease in infectious syphilis has not yet been seen in a complementary reduction of congenital syphilis where there have been 12 cases notified in Queensland since 2001. The majority of these were acquired in remote areas. Syphilis in pregnancy, long recognised as a significant cause of pregnancy loss and perinatal death in northern Queensland, is associated with a high population prevalence of infection.
**Human papilloma virus**

Human papilloma virus (HPV) infects the cutaneous and mucosal epithelial tissues, most commonly involving the skin or anogenital tract. Persistent infection is the leading cause of cervical cancer and is associated with other cancers of the vagina, vulva, penis and anus. HPV genotypes 16 and 18 are the causative agents in 70–80% of all cervical cancers. HPV genotypes 6 and 11 are among the HPV genotypes designated as low risk (for cancer), and are associated with 90% of genital warts. HPV infection is acquired soon after the first sexual encounter with an infected individual. Like all STIs, peak prevalence of HPV infection occurs within the first decade after sexual debut, typically between 15–25 years of age in most Western countries.

In Australia, a national HPV vaccine program began in 2006 using Gardasil®. This quadrivalent vaccine is effective against high risk HPV types 16 and 18 to prevent cervical cancer and low risk HPV types 6 and 11 for prevention of external genital warts. HPV vaccination is currently given to girls via a school based vaccination program in Year 7, at 12 years of age. The Australian Immunisation Handbook recommends HPV for females aged 9–26 years. Population based preventive measures include dissemination of general information about HPV. Health professionals should include in their sexual health counselling discussions that cover abstinence and the importance of using condoms ‘from start to finish’ with no unprotected genital contact. This can also be an opportunity to discuss smoking as a risk factor, due to its association with an increased risk of genital cancer.

**Hepatitis B and C**

The rate of diagnosis of HBV infection in the Aboriginal and Torres Strait Islander population resident in the Northern Territory, South Australia, and Tasmania was 237 cases per 100 000 in 2006 declining to 120 cases per 100 000 in 2009. The rate of diagnosis of newly acquired HBV in the same group was 5 cases per 100 000 in 2005–09. The estimated prevalence of chronic HBV in the Aboriginal and Torres Strait Islander population ranges from 2% in some urban communities and up to 8% in some rural communities. The population rate of diagnosis of HCV infection in Aboriginal and Torres Strait Islander residents in the Northern Territory, South Australia and Western Australia was 131 cases per 100 000. The rate was substantially higher for Aboriginal and Torres Strait Islander people in South Australia and Western Australia compared to the non-Indigenous population, yet it was lower for Aboriginal and Torres Strait Islander people in the Northern Territory compared to non-Indigenous residents. This may be related to different rates of injecting drug use.

Chronic HBV and HCV infections cause significant morbidity and mortality through sequelae such as liver fibrosis, cirrhosis and hepatocellular carcinoma. Together, they are the most common indication for adult liver transplantation in Australia. Antiviral therapy is the standard treatment for HBV and HCV infection in adults. It is currently not listed as approved for the treatment of children in Australia. Chronic HBV causes cirrhosis in around 25% of adults over a 20-year period and is a precursor to hepatocellular carcinoma. The lifetime risk of cirrhosis is 20–30% in perinatal and childhood infections. Studies in the Northern Territory in the 1980s and 1990s found prevalence rates for HBsAg of 8.2% among urban and rural Aboriginal school children. Prevalence studies have shown that HBsAg is highest among Aboriginal and Torres Strait Islander prison inmates, at 12%. HCV transmission occurs predominately among people with a recent history of injecting drug use. It is the underlying cause of liver disease in 28% of liver transplants in Australia.
Human immunodeficiency virus

The per capita rate of HIV diagnosis in the Aboriginal and Torres Strait Islander population was similar to that in the non-Indigenous population. In the Aboriginal and Torres Strait Islander population, the rate declined from 4.7 cases per 100,000 in 2000–04 to around 3.9 cases per 100,000 in 2005–09 but this is based on small, localised numbers and may not reflect a national pattern. Higher proportions of Aboriginal and Torres Strait Islander cases of HIV infection were attributed to heterosexual contact (21% compared with 15%) and injecting drug use (20% compared with 3%) than in non-Indigenous cases.5

HIV prevalence in Australia is lower than in most comparable high income countries. One of the significant factors for this is the early adoption of needle syringe programs, another was effective early education though peer groups and community organisations. The rate of HIV notification in Aboriginal and Torres Strait Islander people has remained relatively stable over the past 6 years and disease incidence rates are similar in Aboriginal and Torres Strait Islander populations and non-Indigenous populations.5 Among Aboriginal and Torres Strait Islander people, HIV is seen more in women and heterosexual couples and the rate is seven times greater for those who inject drugs, when compared to subgroups of non-Indigenous people. The reason for this trend is thought to be due to less access to appropriate health services and harm reduction activities and increased rates of STIs.23 Co-infection with chlamydia, gonorrhoea and/or trichomonas are significant risk factors for HIV infection, highlighting the importance of a comprehensive and systematic management of a person’s overall sexual health as a key strategy in reducing the risk of HIV infection.24

Interventions

Immunisation

HPV vaccine has been developed to prevent cervical cancer and the National Immunisation Program provides vaccination for girls aged 12–13 years, ideally before their first sexual contact. Systematic review of the efficacy of HPV vaccination for young girls show seroconversion rates over 99.5% after vaccination and studies are ongoing to ascertain whether a booster dose of HPV will be required.25,26 The age standardised rate for death from cervical cancer in Aboriginal women in Queensland, Western Australia, the Northern Territory and South Australia from 1997 to 2000 was five times that for non-Indigenous women (11.3 vs 2.1 per 100,000 women).27,28 It is too early to see evidence of a reduction in rates of cervical cancer after HPV vaccination, as cancers can occur decades after infection, but there has been a decline in high grade abnormalities on cervical lesions, particularly in women naïve to HPV types 16 or 18.29

A systematic review of HBV vaccination in people with no previous exposure or unknown exposure status showed that vaccination reduces the risk of developing HBV infection by 88% for HBV surface antigen marker and 62% for anti-core antibody marker.30 To reduce perinatal transmission of HBV in newborn infants of HBsAg positive mothers, a systematic review concluded that HBV immunoglobulin plus vaccine was required.31 Neonatal HBV vaccination was introduced in the late 1980s to at risk groups in Australia. This was offered to Aboriginal children in the Northern Territory in 1988 and in 1990, universal infant vaccination commenced in the Northern Territory.31 The National Universal Infant HBV Vaccination Program began in 2000. The Australian Immunisation Handbook recommends universal neonatal HBV vaccination, ideally in the
first 24 hours of life, followed by a primary course of vaccination at 2, 4 and 6 or 12 months age. This includes vaccination of all adolescents aged 10–13 years who have not yet had a primary course of vaccination. Individuals vaccinated at birth are only just reaching 23 years of age in the Northern Territory and 11 years of age in the rest of Australia, therefore there will be a need for prevention and management of chronic HBV among Aboriginal and Torres Strait Islander people for decades into the future. The current Australian Immunisation Handbook also recommends HBV vaccine for high risk individuals who are injecting drug users, household and sexual contacts of HBV carriers, incarcerated individuals and men who have sex with men. It does not specifically recommend HBV vaccine for Aboriginal and Torres Strait Islander people who are outside the ages eligible for the National Immunisation Program or who are not in a high risk group. This is in contrast to the Gastroenterological Society of Australia and New Zealand recommendations that all Aboriginal and Torres Strait Islander people are in a higher risk group and should be screened and vaccinated if non-immune. HBV vaccination for Aboriginal and Torres Strait Islander children and young adults up to the age of 20 years are funded through some state/territory immunisation programs. HBV vaccine for Aboriginal and Torres Strait Islander adults over 20 years is state government funded in New South Wales and South Australia only. In the Northern Territory, Western Australia and Tasmania, HBV vaccines are funded for catch-up immunisation for Aboriginal and Torres Strait Islander school-aged children only. In Victoria, HBV vaccines are only funded for household contacts and seronegative injecting drug users. In Queensland, HBV vaccines are only funded for school vaccination programs.

The Australian Immunisation Handbook recommends hepatitis A vaccine for people who have chronic HBV and/or HCV, for injecting drug users and for men who have sex with men. There is a vaccination program for all Aboriginal and Torres Strait children residing in the Northern Territory, Queensland, South Australia and Western Australia.

**Screening**

Screening is designed to detect disease in people without signs or symptoms of that disease and should be followed by confirmatory testing and treatment in the event of a positive diagnostic test. If health services do not have the capacity to respond to a positive screening test then the test should not be undertaken in the first place.

With the introduction of nucleic acid amplification tests (NAATs) in the 1990s, screening for chlamydia, gonorrhoea and trichomonas is now simple. This has had a dramatic impact on the way we screen for STIs but has resulted in a decrease in the number of swabs sent for culture and sensitivity. NAATs for chlamydia, as well as gonorrhoea and trichomonas, can be conducted on swab specimens obtained from the endocervix (chlamydia and gonorrhoea) or high vagina (chlamydia and trichomonas), or self administered low vaginal swabs (SOLVS) and first void urines (FVU). Self collected samples increase ease of screening. When collecting an FVU, patients should be advised that an ideal specimen is collected 2 hours after last void; earlier specimens will lose some sensitivity. An NAAT can be performed on a few millilitres of urine but 25 mL is better, and refrigeration is recommended if there is a time delay beyond 24 hours before getting the sample to the laboratory. The specimen should be frozen if it will be longer than 4 days before processing. The choice of chlamydia, gonorrhoea and trichomonas testing from FVU, SOLVS or ECS/HVS in women...
should take into account patient preference. Endocervix and high vagina swabs are the routinely collected screening tests when performing a speculum examination.\textsuperscript{35} For men, FVU is the only screening option. The promotion of the same method of screening (ie. FVU) for women as for men may suit some regions. At each primary healthcare encounter that results in consideration of STI screening, it is important to provide pretest counselling and education about other STIs as well as safe sex advice including the use of condoms for prevention of STIs.

NAAT is recommended for gonorrhoea screening.\textsuperscript{11} \textit{N. gonorrhoeae} can be sensitive or resistant to penicillin and resistance patterns vary. Therefore a positive NAAT result often needs further information about the susceptibility of the particular strain to penicillin.\textsuperscript{36} It is recommended, therefore that for NAAT positive gonorrhoea, a swab for culture is collected within 1 week to gather important information on sensitivities for the local population.\textsuperscript{37} While it is recommended that women presenting with a vaginal discharge are tested for trichomonas,\textsuperscript{17} it is not recommended as a screening test for asymptomatic women. Local prevalence data should be used to guide the need to screen, as the prevalence rate has been found to be high in the Northern Territory, northern Queensland and the Kimberley region of Western Australia,\textsuperscript{38} but low in southern urban sexual health clinic settings. A study in Sydney reported a higher prevalence of trichomonas in an urban STI clinic population when testing using NAATs than previously reported.\textsuperscript{17} As NAAT for trichomonas becomes more widely available there may be updated prevalence data and recommendations for screening.

Syphilis and HIV screening is not recommended for routine screening of asymptomatic individuals but should be considered if the patient reports risk factors that promote STI or BBV transmission (Table 8.1) and where local prevalence rates are high.\textsuperscript{13} A low threshold for testing is recommended, as some people are reluctant to disclose risk behaviours or identify their own risk taking activities. Local prevalence data can assist in decisions to include syphilis and HIV routinely in screening. Syphilis infection is of particular concern during pregnancy because of the risk of transplacental infection to the fetus. Congenital syphilis infection of the fetus is associated with several adverse outcomes including perinatal death, pre-term birth, low birthweight, congenital abnormalities, active congenital syphilis of the newborn and long term sequelae such as deafness and neurological impairment.\textsuperscript{39} It is for this reason that syphilis screening is recommended early in antenatal care. Vertical syphilis transmission usually occurs after 4 months gestation, so early screening and treatment should prevent most cases. Individual antenatal patients who remain at high risk for STIs should be re-screened for relevant STIs again in the third trimester.\textsuperscript{39}

\textbf{Behavioural factors}

Screening for STIs provides the opportunity to offer prevention and health promotion advice. Condom use for vaginal and anal sex will significantly reduce the risk of STIs.\textsuperscript{13} It is the most effective method of preventing HIV transmission. When discussing safe sex practices, it is important to recommend the use of condoms with water based lubricant for all genital contact during vaginal and anal intercourse. It is also important to discuss the barriers to condom use and how they might be overcome and to recommend an STI check with new partners before couples in a monogamous relationship stop using condoms. Discussion of issues around personal safety, self respect and respect of others can also promote healthy and more stable relationships.\textsuperscript{40}
The Queensland Sexual Health Clinical Management Guidelines has comprehensive chapters that cover history taking and risk assessment including a health worker’s legal obligations. It is important to be familiar with the legislation in your state or territory regarding sexual activity in persons under the age of 18 years as there are mandatory reporting requirements in some jurisdictions. Pretest discussions should also include talking about what a positive test result would mean and explaining the notification requirements for STIs while reassuring the patient that their privacy will be respected.

Health promotion interventions to provide information on STI transmission and prevention as well as skill development, can have a positive effect on sexual risk reduction for up to 3 months after intervention, measured by increased use of condoms for vaginal intercourse.

Contact tracing is a voluntary process where sexual contacts of index cases are notified of their exposure to an infection. Contact tracing can be broadly used to cover both partner notification (patient referral) and provider referral. Partner notification involves the index case contacting his or her own sexual contacts and the health provider advising on the information to be given to the partner. It may also include patient delivered partner therapy (such as azithromycin for chlamydia). Provider referral involves the healthcare worker directly advising the contact or using their local sexual health team to perform this task. Provider referral allows for confidential contact tracing and is the method of choice for infections such as HIV. It is important to have access to the Australian Contact Tracing Manual (see Resources) as this has the necessary information on how far back to trace for individual diseases. There are very limited data to comment on the effectiveness of contact tracing; a Cochrane review in 2001 found that health worker notification to a contact was a more effective way to treat contacts than patient notification. The strategy of contact tracing varies between states and regions. Most states have a sexual health unit that will oversee GP notifications of HIV, syphilis and gonorrhoea, but chlamydia partner notification is usually followed up by the GP and their clinic health team. There is limited evidence based information regarding contact tracing effectiveness for Aboriginal and Torres Strait Islander people. A literature review by the Burnet Institute suggests that health worker referral or patient delivered partner therapy is appropriate and that Aboriginal and Torres Strait Islander health worker involvement should be offered sooner rather than later. It should be noted, however, that patient delivered partner therapy is not recommended in several Australian jurisdictions. Although the review noted that avoiding the use of letters or the telephone to notify may be important, these strategies could still be appropriate, depending on local circumstances and protocols.

Chemoprophylaxis

Post-exposure prophylaxis (PEP), which is the provision of a course of treatment to someone exposed to HIV or HBV, reduces the risk of infection with the virus and prevents disease. The exposure could be 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 after exposure; this involves the prescription of antiretroviral drugs over a course of 28 days. This is administered via a S100 prescriber for HIV drugs. It is estimated that receptive anal intercourse and sharing injecting drug equipment with an HIV positive individual constitutes the highest risk of transmission of HIV and concurrent STIs are one of the cofactors that significantly increase the risk of sexual transmission. The evidence for this secondary prevention strategy mostly comes from observational studies on animals and mother-to-child transmission.
Environmental influences

Harm minimisation is the principle underlying Australia’s National Drug Strategy 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. Needle and syringe exchange programs provide sterile injecting equipment and are an effective, safe and cost effective component of harm reduction strategies. It was found that between 1991 and 2000, needle and syringe exchange programs cost Australian governments $130 million dollars but saved $7.8 billion by preventing 25 000 cases of HIV and 21 000 cases of HCV. International research has shown that there is a reduction of spread HIV and HCV in prisons that operate needle syringe exchange programs and evaluation of these prison programs found that more people access drug treatment. Data collected from the 2005–09 National Needle and Syringe Exchange Programs Survey show that among those participating in their annual survey who reported recent incarceration, approximately 1 in 3 reported injecting in prison. Patients in contact with needle syringe exchanges or in primary care settings should opportunistically be delivered brief interventions focused on motivation to assist with cessation of drug use. Motivation to change behaviour can be enhanced by discussions and feedback that explore patient perspectives and treatment options for drug use in a non-judgemental manner. Two sessions, each lasting 10–45 minutes, are recommended, with the primary focus on harm minimisation. In this setting, harm minimisation involves education to reduce risky behaviours, the consideration of abstinence, access to needle and syringe exchange programs and opioid substitution therapy and, ideally, access to peer group educators.

There is healthy debate in Australia about current and future harm minimisation strategies. The prohibitionist activities enacted at the level of law enforcement include lack of access to needle and syringe exchange programs in prisons, increasing use of drug sniffer-dogs, and lack of political support for medically supervised injecting drug rooms versus the harm reduction approach of health and alcohol and other drug specialists.

Injecting drug use has been strongly linked with HIV and HCV infections and unsafe injecting practices have led to the epidemic of HCV infections. Although several illicit drugs can be injected (eg. opioids, methamphetamine, cocaine), the majority of evidence on environmental interventions relates to opioid use. Opioid dependent individuals have been found to have an annual mortality of 2–4%, or 13 times that of their peers. This increased mortality is primarily due to overdoses, violence, suicide, and smoking and alcohol related causes. Injecting 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. Treating opioid dependence is aimed at reducing harm and improving quality of life. Opioid substitution therapy consists of daily administration of an opioid agonist such as methadone or an opioid partial agonist such as buprenorphine. The aim of opioid substitution therapy is to reduce the use of illicit opioids, reduce injection of drugs and its risk of BBV infection, reduce criminal activity, reduce 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 is an option and that this treatment is accessible to disadvantaged populations. WHO also recommends
the availability of a range 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. Opioid agonist maintenance treatment has been shown to reduce the seroconversion to HIV.53 This correlates with measured reductions in drug related and sex related risk.

General practitioners often have patients who present with requests that hint at opioid addiction such as escalating opioid doses for chronic pain, ‘lost’ prescriptions and injection related morbidity. These are opportunities to discuss harm minimisation strategies, including treatment options such as opioid substitution therapy. It is important to be familiar with the opioid pharmacotherapy prescribers in your region and referral pathways for patients who demonstrate a willingness to change. Patients can also present in a crisis when their level of motivation for change is high. The more readily available the treatment program, the more likely we can take advantage of the motivational high. Each jurisdiction in Australia has its own requirements for training of opioid prescribers. The training is free and usually involves a half or 1 day workshop. GPs working with Aboriginal and Torres Strait Islander people should consider undertaking this training so that their service is able to provide fully comprehensive primary healthcare to this vulnerable and marginalised group of people. There are already many GP prescribers and experienced alcohol and other drug health workers and counsellors in Aboriginal Community Controlled Health Services in Australia who can be consulted for advice and support in this regard.
### Recommendations: General preventive advice

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<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
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</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All people with risk factors for STIs or BBVs (see Table 8.1)</td>
<td>Screen for STIs according to local prevalence guidelines and screen for BBVs if risk factors are present (see specific recommendations below)</td>
<td>Annually and re-screen 3 months after positive test</td>
<td>GPP 43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>People diagnosed with an STI</td>
<td>Review STI risk factors and screen for other STIs according to local prevalence guidelines; consider also screening for BBVs if risk factors are present (see Table 8.1)</td>
<td>On diagnosis and re-screen in 3 months</td>
<td>GPP 43</td>
<td></td>
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<tr>
<td></td>
<td>Sexual partners of a person with an STI</td>
<td>Ensure contact tracing is undertaken at time of diagnosis and appropriate testing and treatment is offered to contacts, as per Australasian Contact Tracing Manual (see Resources)</td>
<td>Every positive screen</td>
<td>IB 45</td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All sexually active people</td>
<td>Provide sexual health counselling including proactive discussion of issues of sexuality</td>
<td>Opportunistic IIB 19,44</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Recommend condom use with all sexual activity</td>
<td>Opportunistic IIIB 55</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>People at higher risk of HBV or HCV infection (see Table 8.1)</td>
<td>Provide counselling on harm minimisation and promote peer education strategies around safer sex and injecting drug use</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>GPP 56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>People with opioid dependence</td>
<td>Conduct brief motivational interviewing to reduce use of illicit drugs, harm with injecting drugs, risky alcohol use and risk of BBV infection and STIs, particularly for those unlikely to attend specialist treatment (see Resources)</td>
<td>Opportunistic IIC 50</td>
<td></td>
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<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>Exposure to HIV both occupational and non-occupational</td>
<td>Assess post-exposure risk using national guidelines (see Resources) and provide post-exposure prophylaxis (PEP) within 72 hours of the risk exposure when indicated</td>
<td>Opportunistic GPP 46</td>
<td></td>
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<tr>
<td></td>
<td>People with opioid dependence</td>
<td>Opioid substitution therapy should be made accessible to all populations, including those in prison populations and other closed settings</td>
<td>As early as possible in dependence situation</td>
<td>IIIB 53</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Injecting drug users</td>
<td>Needle and syringe programs should be made available to all populations including prison populations</td>
<td>Opportunistic IIIA 63</td>
<td></td>
<td></td>
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</tbody>
</table>
## Recommendations: Sexually transmissible infections

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
</table>
| **Screening: chlamydia**     | All people aged 15–29 years of age if sexually active | Recommend nucleic acid amplification tests (NAAT) via:  
- endocervical swab if having a speculum examination, or  
- first void urine, or  
- self administered low vaginal swab | Annually | IA (to age 25 years)  
GPP (25–29 years) | 35,41 |
|                             | All people aged ≥30 years and at high risk (see Table 8.1) | First visit | |
|                             | All pregnant women | First visit and again in third trimester | Once | |
|                             | Pregnant women at high risk of STI (see Table 8.1) | | | |
|                             | Women having a termination of pregnancy | | | |
|                             | Men who have sex with men | Recommend first void urine NAAT and anal swab NAAT | Annually | IA | 64 |
| **Screening: gonorrhoea**    | Sexually active people aged 15–39 years and pregnant women where local prevalence rates are high (see reference 7) | Recommend NAAT (as above) | Annually | IIB (age <25 years)  
GPP (age 25–39 years and pregnant women) | 11,41 |
|                             | Men who have sex with men | Recommend throat swab NAAT and culture, plus anal swab NAAT and culture | Annually or 3–6 monthly if high risk (see Table 8.1) | IA | 64 |
| **Screening: Trichomonas vaginalis** | All sexually active people aged <35 years where local prevalence rates are high (see Resources) | Recommend NAAT for women (as above) and first void urine NAAT for men | Opportunistic if symptomatic | IIIB | 11,65 |
| **Screening: syphilis**      | All pregnant women | Recommend testing with specific treponemal tests (EIA or TPPA or FTA-Abs) and non-specific treponemal tests (PPR). Liaise with local pathology providers to determine which tests are available for screening | At first visit  
Repeat at 28 weeks if positive, in a high prevalence area or if risk factors for STIs are present | IIID | 66 |
|                             | Men who have sex with men  
Others at high risk of STIs | Syphilis testing as above | Annually | IIB | 35 |
<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Levels/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immunisation: HBV</strong></td>
<td>Neonates</td>
<td>Recommend HBV vaccination</td>
<td>Once at birth prior to leaving hospital</td>
<td>ID 30</td>
<td></td>
</tr>
<tr>
<td>Babies born to mothers who are HBsAg positive</td>
<td>Recommend HBV immunoglobulin and vaccination at birth</td>
<td>Complete primary course of vaccination, followed by testing for anti-HBs and HBsAg at 3–12 months after completing vaccination (see Australian Immunisation Handbook)</td>
<td>Immunoglobulin (HBIG) ideally within 12 hours and vaccination (HBV) preferably within 24 hours (definitely within 7 days) of birth</td>
<td>IA 18,31</td>
<td></td>
</tr>
<tr>
<td>Unvaccinated people at high risk of STI/BBV infection (see Table 8.1)</td>
<td>Recommend HBV vaccination</td>
<td>Test healthcare workers, those at risk of severe or complicated disease, haemodialysis patients, sexual partners and household contacts of recently notified HBV carrier for seroconversion</td>
<td>3 doses at 1 and 6 months* 4–8 weeks after the last dose</td>
<td>ID GPP</td>
<td>30</td>
</tr>
<tr>
<td>Individuals exposed to HBsAg positive individuals or unable to be identified and tested rapidly</td>
<td>Offer HBV post-exposure prophylaxis (HBIG and primary course of vaccination) for non-immune people</td>
<td>Initiate within 72 hours (or 14 days for sexual contact)</td>
<td>IIC 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People with HCV infection or chronic liver disease not immune to HBV</td>
<td>Recommend HBV vaccination</td>
<td>3 doses at 0, 1 and 6 months*</td>
<td>IIC 18,67,68</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Immunisation: HPV</strong></td>
<td>Girls/women prior to first sexual activity Females who are sexually active</td>
<td>Recommend HPV vaccination (see Chapter 15, recommendations for cervical cancer prevention)</td>
<td>10–13 years of age: school-based 14–26 years of age at cost to the patient</td>
<td>IA 19</td>
<td></td>
</tr>
<tr>
<td><strong>Immunisation: HAV</strong></td>
<td>Men who have sex with men Injecting drug users People with chronic HBV and HCV infection</td>
<td>Recommend hepatitis A vaccination if serology is negative (see Australian Immunisation Handbook)</td>
<td>Once</td>
<td>GPP 18,69</td>
<td></td>
</tr>
<tr>
<td><strong>Screening: HBV</strong></td>
<td>Non-vaccinated or vaccine status unknown People at high risk for BBVs Healthcare workers</td>
<td>Offer individual HBV screening including: • HBsAg (a marker of acute or chronic infection) • HBsAb (a marker of immunity) • HBcAb (a marker of recent or past infection) See Resources for guidelines on interpreting HBV tests If serology is negative, offer HBV vaccination as above*</td>
<td>Opportunistic</td>
<td>GPP 56,70,71</td>
<td></td>
</tr>
</tbody>
</table>
Recommendations: Bloodborne viruses (continued)

<table>
<thead>
<tr>
<th>All pregnant women</th>
<th>Recommend HBV screening to allow timely HBV vaccination and HBIG for infant at birth (see Chapter 9: Antenatal health)</th>
<th>At first antenatal visit</th>
<th>III–3B</th>
<th>72,73</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening: HCV</strong></td>
<td>People at high risk of contracting HVC infection (see Table 8.1)</td>
<td>Offer HCV serology testing</td>
<td>As part of an annual health assessment</td>
<td>IIA</td>
</tr>
<tr>
<td>Infants born to HCV infected mothers</td>
<td>Offer HCV serology testing</td>
<td>18 months of age (repeated if positive)</td>
<td>IIA</td>
<td>69,74</td>
</tr>
<tr>
<td><strong>Screening: HIV</strong></td>
<td>Pregnant women</td>
<td>Offer HIV serology testing</td>
<td>At first antenatal visit</td>
<td>IIB</td>
</tr>
<tr>
<td>Men who have sex with men and others at high risk of BBVs (see Table 8.1)</td>
<td></td>
<td></td>
<td>As part of an annual health assessment</td>
<td></td>
</tr>
</tbody>
</table>

* Not subsidised on the National Immunisation Schedule but check relevant state/territory immunisation programs

Table 8.1. Risk factors for STIs and bloodborne viruses

<table>
<thead>
<tr>
<th>Risk factors for STIs</th>
<th>Risk factors for BBVs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &lt;30 years</td>
<td>Prison incarceration: current or past</td>
</tr>
<tr>
<td>Age &lt;35 years and sexual network relates to a remote community</td>
<td>Blood transfusion prior to 1990</td>
</tr>
<tr>
<td>Multiple current partners</td>
<td>Tattoos or piercings not performed in a sterile professional setting</td>
</tr>
<tr>
<td>Engaging in group sex</td>
<td>Cultural practices (ie. initiation ceremonies)</td>
</tr>
<tr>
<td>New partner</td>
<td>Current or past injecting drug use</td>
</tr>
<tr>
<td>Using condoms inconsistently</td>
<td>Household member with HBV, HCV or HIV</td>
</tr>
<tr>
<td>Living in an area with a high incidence of STIs</td>
<td>Sexual partner with HBV, HCV or HIV</td>
</tr>
<tr>
<td>Having sex while under the influence of drugs and alcohol</td>
<td>Infants of mothers infected with HCV, HBV or HIV</td>
</tr>
<tr>
<td>Having sex in exchange for money or drugs</td>
<td></td>
</tr>
<tr>
<td>Prison incarceration</td>
<td></td>
</tr>
<tr>
<td>Victim of sexual assault</td>
<td></td>
</tr>
<tr>
<td>Men who have sex with men where any of the above risk factors are also present</td>
<td></td>
</tr>
</tbody>
</table>

Source: Bradford D, Hoy J, Matthews G 200810 National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people Sexual health and bloodborne viruses
Resources

Bloodborne viral and sexually transmissible infections in Aboriginal and Torres Strait Islander people: surveillance and evaluation report 2011 (The Kirby Institute)

Sexual health clinical management guidelines (Queensland Government)

Clinical guidelines for the management of sexually transmissible infections among priority populations (RACGP)

Guidelines for managing sexually transmissible infections

Management of genital Chlamydia trachomatis infection: a national clinical guideline (Scottish Intercollegiate Guidelines Network)
www.sign.ac.uk/pdf/sign109.pdf

Sexually transmissible infections: UK national screening and testing guidelines
www.bashh.org/documents/59/59.pdf

Drug misuse: psychosocial interventions, national clinical practice guideline number 51 (National Collaborating Centre for Mental Health)

Australasian contact tracing manual (ASHM)

HIV, viral hepatitis and STIs: a guide for primary care (ASHM)

Hepatitis B virus testing and interpreting results (ASHM)

Drug use resources

Counsellor’s guide to working with alcohol and drug users

Drug and alcohol psychosocial interventions professional practice guidelines (New South Wales Department of Health)

Drug misuse: psychosocial interventions, national clinical practice guideline number 51 (National Collaborating Centre for Mental Health)
www.nice.org.uk/guidance/CG51/NICEGuidance

Guidelines for the psychosocially assisted pharmacological treatment of opioid dependence (World Health Organization)
References


Chapter 9

Antenatal care

Author Eileen Rafter
Expert reviewers Wendy Cavilla, Vivienne Manessis
Overview

Aboriginal and Torres Strait Islander mothers and babies experience an increased risk of maternal, fetal and neonatal death, pre-term birth and low birthweight when compared with non-Indigenous mothers and babies.1 Poor health and social disadvantage contribute to these poorer perinatal outcomes. Aboriginal and Torres Strait Islander mothers have higher rates of chronic disease such as diabetes and kidney disease, higher rates of sexually transmissible infections and anaemia, higher rates of smoking and alcohol consumption in pregnancy, higher rates of adolescent pregnancies and limited access to affordable nutritious food and health services.2

As for all pregnant women, the antenatal care offered to Aboriginal and Torres Strait Islander women should be woman-centred.2 This means that the care focuses on the individual woman's needs and preferences and that the woman is informed and involved in decision making. Other important factors in improving antenatal care are continuity of carer, allowing adequate time for communication and to establish trust and rapport, and health provider awareness of local community sociocultural factors and health needs.2,3

This chapter focuses on some key aspects of antenatal screening that are of particular relevance to Aboriginal and Torres Strait Islander women and is not a comprehensive guide to all antenatal screening. The first antenatal visit – which should take place in the first trimester – is particularly important. At this visit a comprehensive history, examination and discussion with the woman establishes the necessary schedule of tests and visits. The majority of screening tests are also carried out. Psychosocial assessment is also important at this stage; screening for issues such as domestic violence, financial stress, mental health disorders and substance use, including alcohol.

In addition to general recommendations for the first antenatal visit, specific recommendations have been made for the following priority areas: smoking cessation, alcohol consumption, genitourinary infection screening, mineral and vitamin deficiency, and diabetes.

Smoking cessation

Tobacco smoking is one of the most important preventable causes of adverse pregnancy outcomes. These adverse events include premature birth, placental abruption (double the risk for smokers who consume more than 20 cigarettes a day), spontaneous abortion, low birthweight,4 stillbirth5 and placenta praevia.6 Children exposed to tobacco smoke in-utero have a higher risk of SIDS, asthma and respiratory and ear infections. In addition there is some evidence that in-utero exposure is associated with psychological problems such as attention and hyperactivity problems, disruptive and negative behaviour6 and poorer educational performance.7 Although some studies show the harmful effect of smoking in pregnancy is dose related,8,9 this does not obviate the need to clearly and consistently recommend complete smoking cessation as the safest option.2 The risk of low birthweight is greater if the woman continues to smoke in the third trimester, with one study showing that if a woman is able to give up smoking by her fourth month of pregnancy, her risk of delivering a low birthweight baby decreases to nearly that of a non-smoker.10
Aboriginal and Torres Strait Islander women are three times more likely to smoke during pregnancy than non-Indigenous Australian women, with current smoking prevalence estimated at around 50–60%.

Higher risk groups include teenagers and women who experience socioeconomic hardship. Maternal smoking contributes to a greater proportion of the risk of prematurity and low birthweight for Aboriginal and Torres Strait Islander babies when compared with non-Indigenous babies.

A higher proportion of women stop smoking during pregnancy than at other times in their lives, leading to the hypothesis that pregnancy may be a ‘teachable moment’ for smoking cessation. However, some women who stopped smoking in pregnancy resume after birth and there is a lack of evidence on how to prevent this.

Some women may also take up smoking again during pregnancy so it is important to continue enquiring about smoking and exposure to secondhand smoke throughout pregnancy.

The US, UK and Australia have developed guidelines recommending all pregnant women receive brief interventions to promote smoking cessation in pregnancy. These guidelines are currently based on the ‘5As’ (see Chapter 1: Lifestyle, introduction). There have been many studies on smoking cessation strategies in pregnant women using a range of interventions including advice, counselling, hypnosis, telephone support, motivational interviewing, written and electronic resources, cognitive behavioural therapy, measurement of the byproducts of tobacco smoking, use of nicotine replacement therapy and assessment of readiness to quit. Such strategies have also been found to be beneficial in studies involving Aboriginal and Torres Strait Islander women.

Overall smoking cessation strategies used in early pregnancy can reduce smoking in later pregnancy and lead to a reduction in low birthweight and premature birth. Trials using cognitive behavioural therapy have the strongest evidence and demonstrate statistically significant improvements in mean birthweight. There is no evidence for negative psychological impacts from behavioural interventions and indeed the psychological impact may be positive, with women feeling that ‘somebody cared’ about their health and wellbeing. This suggests a caring, empathic and non-judgemental approach is more likely to result in improved outcomes.

Addressing any underlying factors such as depression, low self esteem and personal, social or marital disharmony are important strategies to promoting smoking cessation. Qualitative research in Aboriginal and Torres Strait Islander women has identified the following factors that may affect motivation or ability to quit: smoking being perceived as reducing stress, smoothing social interactions, providing ‘time out’, relieving boredom, controlling weight and being part of the social norm. For some women smoking may be seen as a less immediate problem compared with other issues. In some areas of Australia it is important to enquire about levels of chewing tobacco as well as smoking. There is some evidence that women with partners who smoke find it harder to quit and are more likely to relapse if they do quit. However, there is a lack of evidence on the effectiveness and cost effectiveness of interventions aimed at encouraging partners and family members who smoke to quit and help pregnant women to stop smoking.

There is mixed evidence on the effectiveness of nicotine replacement therapy (NRT) for promoting smoking cessation in pregnancy. A Cochrane review found that NRT did not have a significant benefit over other types of interventions but there have been no direct comparisons of NRT with any other strategy.
The safety of NRT in terms of effect on fetal development and birth outcomes remains unclear. If NRT is used in pregnancy there are some recommendations that the dose of prescribed nicotine in pregnancy should be similar to a smoking dose and that intermittent forms of NRT are preferred to continuous use formulations as the total dose of nicotine will be less.19

**Alcohol consumption**

Alcohol consumption in pregnancy causes problems for both the mother and baby. For the baby, it is associated with increased risk of severe birth defects such as brain damage, facial deformities and growth problems, and more subtle changes such as learning and behavioural problems. This range of problems is known as fetal alcohol spectrum disorder. The risk to the baby is highest in the first trimester, including the first weeks following conception when the mother may not realise she is pregnant.3 Women who drink alcohol during pregnancy are also more likely to have problems such as miscarriage, bleeding during pregnancy, low birthweight babies, stillbirth, poor nutrition, anaemia and injuries.3 It is important to ask women about their use of alcohol and other substances at the first antenatal visit and, if appropriate, at subsequent visits, in a sensitive, non-judgemental way. A completely safe level of alcohol in pregnancy has not been determined.3 Not drinking alcohol in pregnancy, particularly in the first 3 months, is the safest option.2 If women choose to drink they should be advised to avoid getting drunk and drink no more than two standard drinks on any 1 day and less than seven standard drinks in a week.3

**Genitourinary and bloodborne virus infection screening**

Several genitourinary infections are associated with adverse outcomes in pregnancy and there is a higher prevalence of many of these infections in Aboriginal and Torres Strait Islander women when compared with non-Indigenous women.

**Sexually transmissible infections**

There is considerable state and regional variation in rates of chlamydia, gonorrhoea and trichomonas infection, with some rural and remote communities in the Northern Territory, Queensland and Western Australia having particularly high rates. Aboriginal and Torres Strait Islander people resident in major cities in South Australia, Victoria and Western Australia have three times the rate of chlamydia infection while those resident in remote and regional areas of Australia have up to seven times the rate of chlamydia infection, compared with the non-Indigenous population.20 One study in an urban setting showed an approximately 20% prevalence of STIs in pregnant Aboriginal and Torres Strait Islander women and 36% in women under 20 years of age. There was a prevalence of 14.4% chlamydia, 6.1% gonorrhoea and 7.2% trichomonas.21 STIs are higher in the population aged under 25 years in general (which is significant for Aboriginal and Torres Strait Islander pregnant women given the higher proportion of teenage pregnancies in this cohort) and in women with a recent change in sexual partner. Besides age, other predictors for STIs identified in this study include harmful alcohol use and unwanted pregnancy.

Some studies have found chlamydia is associated with early premature delivery22 and intrauterine growth restriction23 and if not treated it is associated with low birthweight and infant mortality.24 Babies born to mothers with chlamydia also have higher rates of ophthalmia neonatorum, lower respiratory
tract infection and pneumonia.\textsuperscript{25,26} Similarly, case reports suggest an association between untreated gonorrhoea infection in pregnancy and pre-term delivery, premature rupture of membranes, low birthweight, postpartum endometritis and ophthalmia neonatorum.\textsuperscript{27} There is some evidence that infection with \textit{Trichomonas vaginalis} in pregnancy is associated with pre-term birth and low birthweight\textsuperscript{28,29} but again, it is not clear whether this association is causal.

Studies have shown that treating chlamydia infection during pregnancy reduces the incidence of premature rupture of membranes, pre-term birth and low birthweight babies but there is no significant evidence to show that it leads to a decrease in the incidence of neonatal conjunctivitis or pneumonia.\textsuperscript{24,30–33} However, in the case of trichomonas, a Cochrane review looking at interventions in pregnancy found that treatment with metronidazole, while yielding parasitological cure rates of 90%, did not reduce pre-term birth and in one trial might even have increased it.\textsuperscript{34}

Due to its high prevalence in the under 25 years population, screening and treatment of chlamydia is recommended in pregnant women in this age group.\textsuperscript{2,35} In addition, screening for chlamydia and gonorrhoea in populations with a high prevalence of STIs is recommended.\textsuperscript{2,3,35} While trichomonas infection can be highly prevalent in some Aboriginal and Torres Strait Islander communities there is no evidence that screening for it improves pregnancy outcomes, and treatment of asymptomatic trichomonas in pregnancy may cause harm.\textsuperscript{34,36}

**Syphilis**

Syphilis infection during pregnancy can cause miscarriage, stillbirth and congenital syphilis infection (causing permanent impairment, debilitation and disfigurement in affected babies). Syphilis is easily and safely treated in pregnancy with antibiotics, which can prevent these complications.\textsuperscript{37}

Syphilis infection is rare in Australia but more common in the Aboriginal and Torres Strait Islander population, particularly in more remote areas. For the period 2005–09 the diagnosis of syphilis infection was more than four times higher in the Aboriginal and Torres Strait Islander population than the rest of the Australian population, with women aged 29–40 years being diagnosed at 28 times the rate for non-Indigenous women in the same age group.\textsuperscript{38}

Studies have shown that universal screening significantly increases the detection of pregnant women with syphilis compared with selective screening of women at risk\textsuperscript{39,40} and this is cost effective even in areas of low prevalence.\textsuperscript{37,41} For this reason, and for the benefits that treatment of syphilis in pregnancy provides to both mother and baby, universal screening for syphilis infection is recommended in most guidelines.\textsuperscript{2,42} For women who test positive for syphilis in early pregnancy, or for women from a population of high prevalence, a second screening test for syphilis is recommended early in the third trimester of pregnancy and at birth.\textsuperscript{2,3}

The initial test for syphilis is usually a blood test for serum antibodies of treponema (eg. enzyme immunoassay \textit{Treponema pallidum} haemagglutination assay: EIA-TPHA). If this is positive, a non-treponemal test (eg. VDRL or RPR) will be performed by the laboratory to confirm diagnosis and enable a quantitative value of disease activity. Positive results should be interpreted with caution as past treated episodes of syphilis may still produce a low positive result and other trepanematoses (eg. yaws, pinta) may give a false positive for
syphilis. Expert advice should be sought for positive results and consideration of testing for other STIs is advised.

**HIV, hepatitis B and hepatitis C**

Antenatal diagnosis of HIV and hepatitis B infection in the mother allows for the implementation of interventions during pregnancy or at the time of birth that can greatly reduce the risk of transmission of these infections to the child. In the case of HIV, one study found that between 2003 and 2006, the rate of mother-to-child transmission was 1% in women diagnosed antenatally who used at least two interventions (antiretrovirals during pregnancy and delivery by caesarean section) compared with a 50% rate of transmission where there was no antenatal diagnosis or no interventions used. The diagnosis of hepatitis B infection antenatally allows for the administration of vaccination and immunoglobulin to the baby on the day of delivery to prevent mother-to-child transmission.

Studies have shown that screening for HIV or hepatitis B based on risk factors alone would miss a large proportion of pregnant women infected with one or both of these viruses. For this reason, and to prevent transmission to the baby, universal screening for hepatitis B and HIV early in pregnancy is recommended in most guidelines. It is important that appropriate counselling and consent is provided prior to testing.

The benefits of hepatitis C screening during pregnancy are doubtful as there is no way of preventing mother-to-child transmission or of treating the virus during pregnancy. For this reason, guidelines do not recommend universal screening. However, some guidelines do suggest that screening of those at risk of hepatitis C infection may be appropriate, although there is little evidence for this. The risk factors for hepatitis C infection are a history of incarceration, blood transfusion or invasive procedure overseas (or before 1990 in Australia), injecting drug use, needlestick injury or tattooing (see Chapter 8: Sexual health and bloodborne viruses).

**Asymptomatic bacteriuria**

Asymptomatic bacteriuria in pregnancy increases the likelihood of pyelonephritis with an incidence of about 30% in affected women. There is some evidence that untreated asymptomatic bacteriuria may be associated with low birthweight and pre-term birth. However, other factors may be involved and there may only be an association if the bacteriuria progresses to pyelonephritis. Asymptomatic bacteriuria during pregnancy may be more common among Aboriginal and Torres Strait Islander women than non-Indigenous women.

A Cochrane review found that antibiotic treatment of asymptomatic bacteriuria is effective in clearing the bacteriuria and can reduce the incidence of pyelonephritis by 75%. Other evidence shows that screening for asymptomatic bacteriuria reduces the incidence of pyelonephritis from 23.2 per 1000 women with no screening to 16.2 with dipstick testing and 11.2 with urine culture. Dipstick urinalysis has high specificity but low sensitivity and a midstream urine specimen for culture is recommended. There may be a role for dipstick testing in areas where access to pathology services is limited but infection should still be confirmed with culture.

There is no consensus in the literature about the best timing and frequency for testing of bacteriuria in pregnancy but current Australian guidelines recommend a single urine culture at the first antenatal visit.
Asymptomatic bacterial vaginosis

Bacterial vaginosis is a decrease of lactobacilli and an increase in pathogenic bacteria (including *Gardnerella vaginalis*, mobiluncus, bacteroides, prevotella and mycoplasma) in the vagina, which may cause vaginal discharge and malodour or may be asymptomatic. Asymptomatic bacterial vaginosis in pregnancy is associated with an increased risk of pre-term birth, even if the bacterial vaginosis spontaneously resolves later in pregnancy. It is more common among women of low socioeconomic status and women who had low birthweight babies in previous pregnancies. Several large studies in the 1990s in the general population found the prevalence of bacterial vaginosis to be in the range of 9–23%, while a study in remote central Australia found a prevalence of 26–36% among non-pregnant women attending clinics for a woman’s health assessment.

A Cochrane review found that treatment of bacterial vaginosis with antibiotics eradicates the infection but does not change the risk of pre-term birth, low birthweight or premature rupture of membranes in women at low risk of pre-term birth. However, two small studies in the review did show a decrease in the risk of pre-term rupture of membranes and low birthweight in women with previous pre-term birth who were treated for asymptomatic bacterial vaginosis. Screening for asymptomatic bacterial vaginosis in women at low risk of pre-term birth is not recommended. Women at increased risk for pre-term birth may be offered vaginal swab testing and treatment for asymptomatic bacterial vaginosis. Women with symptoms of bacterial vaginosis may also be offered testing and treatment for symptom resolution. Possible adverse effects from treatment need to be taken into account.

Mineral and vitamin deficiency screening and supplementation

Pregnancy increases nutritional demands on the body. This can exacerbate underlying nutritional deficiencies and lead to potentially adverse effects on the mother. A pregnant woman’s nutritional status influences the growth and development of the fetus and forms the foundation for the child’s later health. Women from socioeconomically disadvantaged groups and those with limited access to fresh foods may have nutritional deficiencies. Current guidelines suggest that pregnant women with risk factors for nutritional deficiencies may benefit from a multinutrient preparation. Although there are demonstrated benefits from iron and folic acid supplementation, there is limited evidence of improved pregnancy outcomes from multiple micronutrient supplements. Further, there is evidence that vitamin A, C or E supplements may in fact cause harm and so these are not recommended for use in pregnancy.

The following describes the micronutrients that are particularly important in pregnancy.

Vitamin D

Ninety percent of vitamin D is obtained through synthesis in the skin from sun exposure and the vitamin D status of a newborn is determined by the vitamin D status of its mother. Risk factors for vitamin D deficiency include darker skin, season, and a BMI greater than 30. A history of limited sun exposure is also a risk factor but the association is weaker. Some studies have shown vitamin D deficiency in pregnancy to be associated with an increased risk of pre-eclampsia and gestational diabetes, although these studies are not consistent. Other population based studies have shown an association between maternal vitamin D deficiency and lower birthweights and small for gestational age.
babies. Lack of vitamin D may adversely affect fetal bone mineralisation and tooth enamel, increase the risk of hypocalcaemic fits in babies, cause rickets in children and osteomalacia in adults, although these consequences are rare.

There is mounting evidence of the prevalence of vitamin D deficiency in pregnant Australian women. A recent study showed a vitamin D deficiency (levels less than or equal to 25 nmol/L) or insufficiency (levels between 26 and 50 nmol/L) prevalence of 35% in Canberra and 25.7% in outer southwest Sydney. Other studies have found deficiency prevalence ranging from 5.2% in Victoria to 15% in Sydney. However, there have been few studies on the prevalence of vitamin D deficiency in the Aboriginal and Torres Strait Islander population of Australia. One small study in Adelaide did show some evidence of vitamin D deficiency in Aboriginal women. Another more recent study, also in South Australia (n=58), found vitamin D insufficiency to be highly prevalent among Aboriginal adults, with low mean values in all seasons other than summer.

Vitamin D supplementation during pregnancy improves serum levels in both mothers and their babies and importantly no adverse effects have been reported. The question remains, however, whether routine supplementation improves pregnancy outcomes. Currently there is no evidence to suggest that routine supplementation improves pregnancy outcomes in healthy women without risk factors for vitamin D deficiency. There may be some benefit from supplementation in women at risk of deficiency but the evidence is limited. Further research is required to determine the optimal timing and dosing of vitamin D supplementation in pregnancy. Therefore decision making about whether to offer screening for vitamin D deficiency in pregnancy should take into consideration the individual’s risk factors, the season and climate. In women with proven vitamin D deficiency, supplementation should be initiated, depending on the level of severity and the clinical situation.

Iron

Pregnancy increases the body’s demand for iron due to the expanded red cell volume, the demands of the developing fetus and placenta and blood loss around the time of delivery. Iron deficiency is the most common cause of anaemia in pregnancy in Central Australia and the Top End of the Northern Territory. Depending on the level of severity, anaemia can cause tiredness in the mother, heart failure and increased chance of postpartum anaemia. Low iron stores in the mother can cause anaemia in the baby, which is associated with developmental delay. Risk factors for reduced iron stores early in pregnancy include poor diet, five or more previous pregnancies, adolescent pregnancy, multiple pregnancy and recent or current breastfeeding of another child. Universal screening for anaemia in pregnancy is advised in all pregnancy guidelines.

Although routine oral iron supplementation in pregnancy has been demonstrated to reduce the incidence of anaemia there is a paucity of evidence assessing its outcome on other clinically relevant maternal and neonatal outcomes such as low birthweight, pre-term birth, delayed development and infection. Because oral iron supplementation can cause dose related gastrointestinal side effects and haemoconcentration, routine supplementation of women with normal haemoglobin levels is not recommended during pregnancy. Iron supplementation should be considered in pregnant women who are anaemic, particularly if they are symptomatic or have other health concerns. In women with proven iron deficiency, iron supplementation should be initiated, depending on the level of severity and the clinical situation.
Folic acid
There is strong evidence that folic acid supplementation protects against neural tube defects in pregnancy.\textsuperscript{77–79} In Australia, although there has been a reduction in the incidence of babies born with neural tube defects in the general population, there has not been a reduction in incidence for Aboriginal babies.\textsuperscript{80} One study found the prevalence of neural tube defects in Aboriginal and Torres Strait Islander babies in Western Australia to be almost double that of the non-Indigenous population.\textsuperscript{81} This may, in part, be due to lower levels of folate intake through restricted food choices. There is also evidence that knowledge about the benefits of folic acid supplementation is at a lower level among Aboriginal and Torres Strait Islander women, particularly adolescents.\textsuperscript{81}

Daily supplementation with folic acid (400–500 mcg) is recommended for all pregnant women, prior to conception and for the first 12 weeks of pregnancy.\textsuperscript{2,3,46} Specific attention needs to be given to promoting folic acid supplementation to Aboriginal and Torres Strait Islander women of childbearing age and providing information to individual women at the first antenatal visit.\textsuperscript{2} Higher doses of folic acid (5 mg) are recommended for women at increased risk of neural tube defects.\textsuperscript{3,74,82} These include women with a previous pregnancy with a neural tube defect, pre-pregnancy diabetes, multiple pregnancy, haemolytic anaemia and women on anticonvulsant medication.

Iodine
In Australia there is documented prevalence of mild to moderate iodine deficiency in school children, healthy adults, pregnant women and people with diabetes.\textsuperscript{83} Data are lacking on the prevalence of iodine deficiency among Aboriginal and Torres Strait Islander communities. Iodine requirements increase substantially in pregnancy and lactation to support the neuropsychological development of the fetus. Mandatory fortification of bread is estimated to increase population intakes by an average of 46 mcg per day. This will meet the needs of most of the population but an increased intake in pregnant and lactating women would be desirable. A recent National Health and Medical Research Council literature review concluded that there is good evidence for the safety and efficacy of iodine supplementation in pregnant and lactating women and the risks of iodine deficiency significantly outweigh any potential risks during the perinatal period.\textsuperscript{84} On this basis, iodine supplementation (up to 150 mcg per day) is recommended for pregnant women in Australia.

Diabetes
Diabetes in pregnancy can include pre-existing known type 1 or type 2 diabetes, undiagnosed pre-existing diabetes and gestational diabetes, which is defined as the onset of glucose intolerance in the second half of pregnancy. All forms of diabetes in pregnancy have increased risks for both the mother and baby, depending on the level of glycaemic control. Diabetes in pregnancy is associated with an increased risk of induced labour, pre-term birth, caesarean section and pre-eclampsia. Babies of mothers with diabetes in pregnancy have higher rates of stillbirth, fetal macrosomia, low Apgar scores, neonatal hypoglycaemia, and admission to special care baby units.\textsuperscript{85} Babies born to mothers with pre-existing diabetes have a higher risk of congenital malformations of the spine, heart and kidneys.\textsuperscript{86} In addition, there is evidence that an adverse intrauterine environment is a risk factor in later life for metabolic
disturbances in the babies of diabetic mothers. Raised maternal glycaemic
levels are associated with increased adiposity in childhood and other adverse
metabolic factors that may increase the risks of cardiovascular disease and
diabetes. Women with gestational diabetes also have an increased risk
of developing type 2 diabetes later in life and an increased risk of gestational
diabetes in subsequent pregnancies.

The number of women with undiagnosed pre-pregnancy type 2 diabetes and
gestational diabetes mellitus in the general population is increasing. Aboriginal
and Torres Strait Islander women are 10 times more likely to have pre-existing
type 2 diabetes and 1.5 times more likely to develop gestational diabetes than
non-Indigenous women. Therefore a large proportion of Aboriginal and Torres
Strait Islander women will have known or undiagnosed diabetes mellitus at
antenatal booking.

There is currently a lack of uniformity in the approach to diagnosing gestational
diabetes. The International Association of Diabetes and Pregnancy
recently published new recommendations for the diagnosis of diabetes in
pregnancy, which should provide a more consistent approach to diagnosing
both pre-existing diabetes in pregnancy and gestational diabetes. These
recommendations are based on data showing that there appears to be a linear
association between maternal plasma glucose concentration and adverse
pregnancy outcomes, including at levels below the previous criteria for a
diagnosis of gestational diabetes. It is likely that the International Association
of Diabetes and Pregnancy recommendations will be adopted in forthcoming
Australian guidelines (Table 9.1).

Although specific management recommendations are beyond the scope of this
guide, studies have shown that even for mild gestational diabetes, treatment
with diet and lifestyle modifications decreases the incidence of fetal macrosomia
and pre-eclampsia. Strict glycaemic control is the foundation of diabetes
management in pregnancy. Specific management guidelines are recommended
for further guidance (see Resources).
<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All pregnant women</td>
<td>Discuss and plan the schedule of antenatal visits with the pregnant woman based on her individual needs</td>
<td>At first antenatal visit</td>
<td>IB</td>
<td>2,95</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For an uncomplicated pregnancy review every 4 weeks until 28 weeks, then every 2 weeks thereafter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Offer an ultrasound to determine gestational age and detect multiple pregnancies (best performed between 8 and 13 weeks + 6 days gestation)</td>
<td>At first antenatal visit</td>
<td>IIIB</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Measure blood pressure, height and weight and calculate BMI</td>
<td>At first antenatal visit</td>
<td>IIIB</td>
<td>GPP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Repeated weighing during pregnancy should be confined to circumstances where clinical management is likely to be influenced</td>
<td>Opportunistic</td>
<td>GPP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Auscultate for heart murmurs, in areas with a high prevalence of rheumatic heart disease</td>
<td>At first antenatal visit</td>
<td></td>
<td>GPP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advise women to have oral health checks and treatment if required (see Chapter 4: Dental health)</td>
<td>At first antenatal visit</td>
<td>IB</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Offer Pap test if due</td>
<td>During first trimester</td>
<td></td>
<td>GPP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Offer testing for rubella immunity</td>
<td>At first antenatal visit</td>
<td>IB</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check blood group and antibodies</td>
<td>At first antenatal visit and 28 week visit</td>
<td>IB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pregnant women at risk of pre-eclampsia†</td>
<td>Discuss the purpose and implications of testing for chromosomal abnormalities to promote an informed decision</td>
<td>At first antenatal visit</td>
<td>IB</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>In those wishing to proceed offer women first trimester combined screening for chromosomal abnormalities between 11 and 13 weeks + 6 days gestation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide support to women in regional and remote areas to access this screening. If nuchal thickness ultrasound is unavailable, offer maternal serum screening† between 15 and 17 weeks gestation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Offer ultrasound to assess for fetal morphology abnormalities</td>
<td>At 18–20 weeks</td>
<td>GPP</td>
<td>46</td>
</tr>
<tr>
<td><strong>Immunisation</strong></td>
<td>All pregnant women</td>
<td>Review influenza immunisation status and offer where appropriate (see Chapter 11: Respiratory health)</td>
<td>Opportunistic</td>
<td>GPP</td>
<td>96</td>
</tr>
</tbody>
</table>

† First trimester combined screening includes nuchal thickness ultrasound and plasma beta human chorionic gonadotropin (beta-HCG) and pregnancy associated plasma protein A (PAPP-A)

‡ Maternal serum screening includes plasma maternal serum alpha fetoprotein (AFP), unconjugated oestriol and total human chorionic gonadotropin (HCG)

‡‡ 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
### Recommendations: Smoking cessation

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All pregnant women</td>
<td>Regularly assess smoking status and remind patients to limit/avoid exposure to cigarette smoke</td>
<td>At first and subsequent antenatal visits</td>
<td>IB</td>
<td>2,3,9,14,15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Record in the handheld pregnancy record (if available) or otherwise use local protocols to record this information</td>
<td></td>
<td>GPP</td>
<td>14,15</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>Pregnant women who smoke</td>
<td>Offer interventions to assist smoking cessation ranging from brief advice to more intensive, multicomponent interventions (see Chapter 1: Lifestyle)</td>
<td>At first and subsequent antenatal visits</td>
<td>IB</td>
<td>2,9</td>
</tr>
<tr>
<td><strong>Chemo-prophylaxis</strong></td>
<td>Pregnant women who smoke at least 10–15 cigarettes/day requesting additional assistance with smoking cessation</td>
<td>Consider nicotine replacement therapy (NRT) with discretion, noting that the safety of NRT in terms of effect on fetal development and birth outcomes remains unclear. Discuss the risks and benefits taking into account overall clinical circumstances. If deemed necessary, intermittent forms of NRT are recommended rather than continuous use formulations to reduce the total dose of nicotine</td>
<td>At each antenatal visit</td>
<td>IB</td>
<td>2,3,9,14,15, 3,19</td>
</tr>
</tbody>
</table>
### Recommendations: Genitourinary and bloodborne virus infections

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>Pregnant women aged &lt;25 years</td>
<td>Offer chlamydia testing with a nucleic acid amplification test (NAAT), most commonly by PCR, using either a first void urine, self obtained low vaginal swab or endocervical swab</td>
<td>At first antenatal visit</td>
<td>IIC 2,3,30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pregnant women from communities with a high prevalence of STIs</td>
<td>Offer testing for chlamydia as above and consider testing for gonorrhoea</td>
<td>At first antenatal visit and consider repeat testing at 36 weeks gestation</td>
<td>GPP 2,3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All pregnant women</td>
<td>Offer testing for syphilis, HIV and hepatitis B</td>
<td>At first antenatal visit</td>
<td>IA–IIB 2,3,46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pregnant women from communities with a high prevalence of STIs</td>
<td>Offer additional tests for syphilis infection</td>
<td>At first antenatal visit and at 28 weeks gestation and at birth</td>
<td>GPP 2,3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All pregnant women</td>
<td>Offer testing for asymptomatic bacteriuria with a midstream urine microscopy and culture In areas with limited access to pathology testing, dipstick urine tests may be used to exclude asymptomatic bacteriuria but positive results must be confirmed by midstream urine culture</td>
<td>At first antenatal visit</td>
<td>IA 2,3,30,62</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Women with previous pre-term birth</td>
<td>Offer vaginal swab testing and treatment for asymptomatic bacterial vaginosis (eg. Gardnerella vaginalis, Bacteroides spp.)</td>
<td>Before 20 weeks pregnancy</td>
<td>GPP 2</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Women with positive results for an STI or bloodborne virus</td>
<td>Ensure adequate recall systems are implemented for follow up Recommend partner treatment and contact tracing (See Chapter 8: Sexual health and bloodborne viruses)</td>
<td>N/A</td>
<td>GPP 2</td>
<td></td>
</tr>
</tbody>
</table>
### Recommendations: Alcohol consumption

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All pregnant women</td>
<td>Ask about alcohol consumption</td>
<td>At first and subsequent antenatal visits</td>
<td>GPP</td>
<td>3</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All pregnant women and women planning a pregnancy</td>
<td>Advise that not drinking alcohol is the safest option in pregnancy, particularly in the first 3 months</td>
<td>At first and subsequent antenatal visits (as appropriate)</td>
<td>GPP</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Pregnant women who drink alcohol</td>
<td>Advise women to avoid getting drunk, and advise women to have no more than two standard drinks on any 1 day and fewer than seven standard drinks in 1 week</td>
<td>At first and subsequent antenatal visits</td>
<td>GPP</td>
<td>3,46</td>
</tr>
</tbody>
</table>

### Recommendations: Nutritional assessment and supplementation

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All pregnant women</td>
<td>Offer a full blood examination to assess for anaemia</td>
<td>At first antenatal visit, and at 28 and 36 weeks gestation</td>
<td>IA</td>
<td>2,3,46</td>
</tr>
<tr>
<td></td>
<td>Women at risk of vitamin D deficiency (limited sun exposure, dark skin, BMI &gt;30)</td>
<td>Consider testing for vitamin D levels, particularly in the non-summer months</td>
<td>At first antenatal visit</td>
<td>GPP</td>
<td>2,46,65,74,82,97,98</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All pregnant women</td>
<td>Provide information on the benefits of a healthy diet in pregnancy and give practical, tailored advice on healthy eating</td>
<td>Early in pregnancy</td>
<td>GPP</td>
<td>3,46</td>
</tr>
<tr>
<td><strong>Chemo-prophylaxis</strong></td>
<td>All pregnant women and those considering pregnancy</td>
<td>Recommend 500 mcg of folic acid daily to reduce the risk of newborn neural tube defects</td>
<td>At least 1 month prior to pregnancy and for the first 12 weeks of pregnancy</td>
<td>IA</td>
<td>2,3,46,74,82</td>
</tr>
<tr>
<td></td>
<td>Women with diabetes</td>
<td>Recommend a higher dose of 5 mg of folic acid daily to reduce the risk of newborn neural tube defects</td>
<td>At least 1 month prior to pregnancy and for the first 12 weeks of pregnancy</td>
<td>IC</td>
<td>46,74,97,98</td>
</tr>
<tr>
<td></td>
<td>Pregnant women with proven vitamin D deficiency</td>
<td>Advise vitamin D supplementation – dose titrated according to clinical situation* (see Resources)</td>
<td>At diagnosis</td>
<td>IIB</td>
<td>2,46,73,82</td>
</tr>
<tr>
<td></td>
<td>Pregnant women who are not iron deficient</td>
<td>Routine iron supplementation is not recommended</td>
<td>N/A</td>
<td>IB</td>
<td>2,46,76</td>
</tr>
<tr>
<td></td>
<td>Pregnant women with proven iron deficiency</td>
<td>Offer iron supplementation – oral or intramuscular – dose titrated according to clinical situation</td>
<td>At diagnosis</td>
<td>IB</td>
<td>3,74,75</td>
</tr>
<tr>
<td></td>
<td>All pregnant women</td>
<td>Offer iodine supplementation with 150 mcg/day (see Resources)</td>
<td>At first antenatal visit</td>
<td>IIA</td>
<td>84</td>
</tr>
</tbody>
</table>

* Vitamin D supplementation is not subsidised under the Pharmaceutical Benefits Scheme

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**Antenatal care**

National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people
<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>Pregnant women at risk of undiagnosed diabetes mellitus (BMI &gt;30 kg/m², family history of diabetes, previous gestational diabetes)</td>
<td>Measure fasting blood glucose If not feasible, alternatives include random blood glucose or HbA1c (see Chapter 14: Type 2 diabetes prevention and early detection)</td>
<td>At first antenatal visit</td>
<td>IA</td>
<td>3,92</td>
</tr>
<tr>
<td></td>
<td>Pregnant women who do not have pre-existing diabetes</td>
<td>Perform a 75 g 2 hour oral glucose tolerance test (OGTT) for diagnosis of gestational diabetes (see Table 9.1 and Table 9.2) If a 2 hour OGTT is consistently difficult to achieve, consider alternative tests such as a random blood glucose or a 50 g, 1 hour glucose challenge. If either are abnormal then recommend a 75 g 2 hour oral OGTT</td>
<td>Between 24 and 28 weeks gestation</td>
<td>GPP</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Women postpartum diagnosed with gestational diabetes</td>
<td>Perform a 75 g fasting OGTT</td>
<td>At 6 weeks postpartum</td>
<td>GPP</td>
<td>3,99</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>Pregnant women with diabetes</td>
<td>Offer advice and resources to promote good glycaemic control throughout pregnancy – encourage a healthy diet and exercise Consider referral to specialist services, where available, and consult specific management guidelines for ongoing care (see Resources)</td>
<td>At diagnosis</td>
<td>IA</td>
<td>91,99</td>
</tr>
<tr>
<td></td>
<td>Non-pregnant women who have had gestational diabetes in the past</td>
<td>Advise women of the future risk of developing diabetes and give advice about healthy diet, exercise and weight (see Chapter 1: Lifestyle) Screen for diabetes with a fasting blood glucose (see Chapter 14: Type 2 diabetes prevention and early detection)</td>
<td>At postpartum checks and as part of an annual health assessment</td>
<td>IIB</td>
<td>3,99,100</td>
</tr>
</tbody>
</table>
Table 9.1. The International Association of Diabetes and Pregnancy Guidelines for diagnosing pre-existing diabetes and gestational diabetes in pregnancy*

<table>
<thead>
<tr>
<th>Measure of glycaemia</th>
<th>Consensus threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPG (fasting plasma glucose)</td>
<td>≥7.0 mmol/L</td>
</tr>
<tr>
<td>Hb1c</td>
<td>≥6.5%</td>
</tr>
<tr>
<td>RPG (random plasma glucose)</td>
<td>≥11.1 mmol/L (confirmation with FPG/ HbA1c recommended)</td>
</tr>
</tbody>
</table>

Diagnostic criteria for gestational diabetes

Using a 75 g 2 hour oral glucose tolerance test, one or more of these values is diagnostic of gestational diabetes

<table>
<thead>
<tr>
<th>Glucose measure</th>
<th>Glucose concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPG</td>
<td>≥5.1 mmol/L*</td>
</tr>
<tr>
<td>1 hour plasma glucose</td>
<td>≥10 mmol/L</td>
</tr>
<tr>
<td>2 hour plasma glucose</td>
<td>≥8.5 mmol/L*</td>
</tr>
</tbody>
</table>

* At the time of writing these criteria had not been published by the Australian Diabetes in Pregnancy Society. Current criteria for gestational diabetes are FPG ≥5.4 mmol/L and 2 hour plasma glucose ≥7.9 mmol/L.


Table 9.2. Current interpretive criteria for 75 g OGTT in pregnancy in Australia

<table>
<thead>
<tr>
<th>Glucose measure</th>
<th>Glucose concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>Above 5.4</td>
</tr>
<tr>
<td>2 hour</td>
<td>Above 7.9</td>
</tr>
</tbody>
</table>

Resources

Guidelines for management of diabetes in pregnancy (Australasian Diabetes in Pregnancy Society)

Screening guideline for gestational diabetes (Kimberley Aboriginal Medical Services Council)

Guidelines for treatment of vitamin D deficiency (King Edward Memorial Hospital)

Dietary guidelines for Australian adults (NHMRC)

Iodine, public statement: iodine supplementation for pregnant and breastfeeding women (NHMRC)
Clinical practice guidelines on depression and related disorders in the perinatal period (beyond blue)  

Australian guidelines to reduce health risks from drinking alcohol (NHMRC)  

References


Prevention of depression

Background

The National Mental Health Plan 2003–08 notes that mental health is an area where ‘diverse views exist and ... terms are used in different ways’. The term ‘social and emotional wellbeing’ is often used in Aboriginal and Torres Strait Islander communities when discussing what clinicians might consider to be ‘mental health’, as it implies a holistic, strengths-based approach rather than a medical model.

Social and emotional wellbeing is a key component of the Aboriginal definition of health, includes concepts of connection to country, kin and community and is a view held across the whole lifecycle. However, much of the research in this area is done in settings outside Indigenous communities and is grounded within a more individualistic model of health. As such, inclusion criteria and outcomes are determined by diagnostic categories such as those in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) (Table 10.1). In looking at evidence to make recommendations for the prevention of depression and suicide, this chapter recognises there can be tensions between biomedical and Indigenous concepts of mental health and that traditional research evidence may not be suitable in this context, particularly when assessing the suitability of community based interventions.

Table 10.1. DSM-IV criteria for a depressive episode

<table>
<thead>
<tr>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either depressed mood or loss of interest or pleasure</td>
</tr>
<tr>
<td>Depressed mood most of the day, nearly every day</td>
</tr>
<tr>
<td>Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day</td>
</tr>
<tr>
<td>Significant weight loss when not dieting or weight gain</td>
</tr>
<tr>
<td>Insomnia or hypersomnia nearly every day</td>
</tr>
<tr>
<td>Psychomotor agitation or retardation nearly every day</td>
</tr>
<tr>
<td>Fatigue or loss of energy nearly every day</td>
</tr>
<tr>
<td>Feelings of worthlessness or excessive or inappropriate guilt nearly every day</td>
</tr>
<tr>
<td>Diminished ability to think or concentrate, or indecisiveness, nearly every day</td>
</tr>
<tr>
<td>Recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide</td>
</tr>
<tr>
<td>In addition the episode must interfere with the person’s daily routine or relationships, and not have a cause such as alcohol or other drugs, a physical illness or the death of a loved one</td>
</tr>
</tbody>
</table>

Source: American Psychiatric Association 2000

The extent of depression in Aboriginal and Torres Strait Islander communities is recognised to be a large problem, though it has been difficult to measure accurately. The National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) of 2004–05 contained questions looking at social and emotional wellbeing (rather than depression). Age adjusted figures show that Aboriginal and Torres Strait Islander people aged over 18 years are twice as likely as non-Indigenous people to feel high or very high levels of psychological distress. Similarly, hospitalisation rates for ‘mental and behavioural disorders’ are nearly twice as high.
NATSIHS also found high rates of self reported stress for Aboriginal and Torres Strait Islander adults aged over 18 years compared to the general population (Table 10.2). These stressors are interrelated, often linked to broader life experiences, and include comorbidity associated with other medical conditions. The high prevalence of these stressors in adults 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.

Table 10.2. Proportions of stresses reported in the previous 12 months, by Indigenous status, year and stressor type, Australia, 2004–05 and 2006

<table>
<thead>
<tr>
<th>Type of stressor</th>
<th>Indigenous status/year</th>
<th>2004–06</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death of a family member or friend</td>
<td>Indigenous</td>
<td>42</td>
<td>23</td>
</tr>
<tr>
<td>Serious illness or disability</td>
<td>Total population</td>
<td>28</td>
<td>30</td>
</tr>
<tr>
<td>Not able to get a job</td>
<td>Indigenous</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Alcohol or drug related problem</td>
<td>Total population</td>
<td>25</td>
<td>8.6</td>
</tr>
<tr>
<td>Overcrowding at home</td>
<td>Indigenous</td>
<td>17</td>
<td>–</td>
</tr>
<tr>
<td>Members of a family sent to jail/in jail</td>
<td>Total population</td>
<td>19</td>
<td>–</td>
</tr>
<tr>
<td>Witness to violence</td>
<td>Indigenous</td>
<td>14</td>
<td>3.9</td>
</tr>
<tr>
<td>Trouble with police</td>
<td>Total population</td>
<td>16</td>
<td>3.9</td>
</tr>
<tr>
<td>Discrimination/racism</td>
<td>Indigenous</td>
<td>12</td>
<td>–</td>
</tr>
<tr>
<td>Any stressor</td>
<td>Total population</td>
<td>77</td>
<td>59</td>
</tr>
</tbody>
</table>

Source: ABS, 200640 ABS, 200731

Notes:
1. Proportions are expressed as percentages
2. The total population for ‘serious illness or disability’ data has been estimated by adding proportions for the two sub-components, so may slightly overstate the true proportion

These figures show the levels of psychological distress and significant life events in Aboriginal and Torres Strait Islander communities around Australia. While there are no data that translate these into specific diagnoses within the community, admissions for a principal diagnosis of ‘mental and behavioural disorders’ were nearly twice as high for Aboriginal and Torres Strait Islander people when compared with non-Indigenous people.

The situations in which depression risk is greater and the situations in which depression is more likely to be missed are outlined in Table 10.3.
Table 10.3. Features of comprehensive support services associated with improved outcomes from depression screening

- An initial visit with a nurse specialist for assessment, education and discussion of patient preferences and goals
- A follow up visit with a trained nurse specialist and ongoing support for adherence to medication for those prescribed antidepressant medications
- A visit with a trained therapist for cognitive behavioural therapy
- A reduced copayment for patients referred for psychotherapy
- Professional support including the following:
  - staff and clinician training (1 or 2 day workshops)
  - availability of clinician manuals
  - monthly training lectures
  - academic detailing
  - resource materials for clinicians, staff, and patients
- Institutional financial commitment


Screening 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. 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. Where these intensive support services are available, sensitivity and specificity that is comparable with other larger screening tools can be achieved by asking the following questions:

- ‘Over the past 2 weeks, have you felt down, depressed or hopeless?’
- ‘Over the past 2 weeks, have you felt little interest or pleasure in doing things?’

These two questions achieve 95% specificity and 66% sensitivity in general populations. These questions have also been tested with Aboriginal people with ischaemic heart disease attending an Aboriginal Medical Service in Darwin. In this setting, a ‘Yes’ answer to either question was 100% sensitive and 12.5% specific for depression, meaning that a negative result rules out depression but there are many false positives. It is not clear how applicable this result is in other Aboriginal and Torres Strait Islander communities or people without ischaemic heart disease. Further, there is evidence to suggest that ‘probable depression’ detected with a screening tool may no longer be present 2 weeks later. This suggests that repeat screening may be needed.

Although there is no evidence to suggest any harm from screening programs, there are potential harms from 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 on non-steroidal anti-inflammatory drugs, upper gastrointestinal bleeding. A natural desire to use a screening tool across a population to identify and treat depression would need to take the risk of harm into account. Given this evidence, the mainstay of depression should continue to be the use of a careful clinical assessment in
the context of an ongoing relationship with the patient, and the judicious use of antidepressants as part of a management plan that includes ongoing support from skilled healthcare professionals aware of the local culture and context.

In a systematic review commissioned by the US Preventive Health Task Force, the minimum support needed to demonstrate a beneficial effect from depression screening was 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 are complex. Table 10.4 highlights the features most strongly associated with improved outcomes. Working as part of a team, including Aboriginal and Torres Strait Islander health workers, is considered good practice in Aboriginal and Torres Strait Islander health. The lack of published research evidence in this area should not be considered evidence of lack of effect.

### Table 10.4. People at greater risk for depression

- 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 abuse
- 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 – eg. the belief that nothing can be done, or that depression is a normal response to stress
  - communication difficulties

Source: National Collaborating Centre for Mental Health and the Royal College of Psychiatrists 2010

### Interventions to prevent depression

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. There is some evidence that exercise is mildly beneficial in prevention of depression for children and adolescents.

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. 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.

There is no evidence to support the use of antidepressants medication for primary prevention of depression in the general population.
### Recommendations: Depression prevention

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All people aged 15+ years</td>
<td>Screening for depression is not routinely recommended unless comprehensive support services are available (see Table 10.3)</td>
<td>N/A</td>
<td>IB</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In the absence of services outlined in Table 10.3, useful support services include those provided by social and emotional wellbeing workers and Aboriginal mental health workers and psychologists with an understanding of the local context (see Resources)</td>
<td></td>
<td>GPP</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If comprehensive support services are not available then assess for the presence of risk factors for depression (see Table 10.4)</td>
<td></td>
<td>GPP</td>
<td>6</td>
</tr>
<tr>
<td>People in whom depression risk is greater (see Table 10.4)</td>
<td></td>
<td>Take a patient history to assess mood and consider asking:</td>
<td>Opportunistic</td>
<td>1B</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ‘Over the past 2 weeks, have you felt down, depressed or hopeless?’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ‘Over the past 2 weeks, have you felt little interest or pleasure in doing things?’ (See Table 10.1 for diagnostic criteria)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All people aged 15+ years</td>
<td>Behavioural interventions are not recommended for prevention of depression</td>
<td>N/A</td>
<td>ID</td>
<td>9–11</td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>All people aged 15+ years</td>
<td>Medications are not recommended for primary prevention of depression</td>
<td>N/A</td>
<td>GPP</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>All people aged 15+ years</td>
<td>Community based psychosocial programs are not recommended for prevention of depression</td>
<td>N/A</td>
<td>IC</td>
<td>9,11</td>
</tr>
</tbody>
</table>
Prevention of suicide

Background
Aboriginal and Torres Strait Islander people die from intentional self harm at higher rates than non-Indigenous Australians in all states and territories. Overall, deaths from intentional self harm in Aboriginal and Torres Strait Islander men are 2.4 times that of non-Indigenous men, and 1.7 times higher for Aboriginal and Torres Strait Islander women. Deaths from intentional self harm occur at a much younger age in Aboriginal and Torres Strait Islander people – around three times higher for those aged under 25 years and for those aged 25–34 years. Rates of suicide have increased over the past 3 decades.

Research from Aboriginal communities suggests that suicide is less closely connected with biomedical models of ‘mental health’ and has different sociocultural meanings within those communities. Suicide may need to be conceptualised within a broader paradigm characterised by exclusion and disadvantage, rather than merely as part of a mental health diagnosis. Consequently conventional suicide prevention measures based on biomedical models of care may not meet community expectations. The method of suicide chosen (especially by young men) and the close-knit nature of community can impact on help seeking behaviour and have substantial impact on the family and the community. Thus, suicide prevention measures are more likely to succeed if they are implemented by people who are fully aware of local context. Once again, it is important for health practitioners to work with the local Aboriginal and Torres Strait Islander mental health workforce where available.

Screening
There is no evidence that screening for suicide risk leads to a reduction in intentional self harm morbidity and suicide related mortality rates. There are several tools available for screening for suicidal ideation, however, only one has been validated in a primary healthcare setting: the Symptom Driven Diagnostic System for Primary Care (SDDS-PC). This tool has 62 items, three of which relate to suicidal ideation. Although individual questions in this tool are reported to have good specificity and sensitivity, the positive predictive value is very low. This means that many people have to be screened to prevent one suicide. Although there is no analysis of adverse outcomes from screening tests for suicide, the fact that large numbers may be screened without benefit suggests there may be potential for harm. 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. It is worth emphasising that this is not a recommendation not to screen for suicide risk, but that the application of a uniform set of questions applied at a population level has not shown any benefit. Clinicians should think of the possibility of suicide and explore this, especially in those with:

- a past history of intentional self harm
- a history of mood disorders
- hazardous alcohol consumption or use of other recreational drugs.
Managers of health services should note, too, that education of physicians has also been shown to reduce suicide rates. Given the clustering of suicide in some Aboriginal and Torres Strait Islander communities, practitioners should consider the impact on and their response to other community members also. (See Resources for useful information for health professionals.)

Interventions to reduce suicide risk

There is currently no evidence showing a favourable effect of behavioural interventions on people with suicidal ideation or suicidal behaviour, though there are some promising results for cognitive behavioural therapy or interpersonal therapy in those at risk. However, in these studies there are a large number of participants who have withdrawn from the study. There is also some evidence that these interventions may work by ‘enhancing effective contact with those who are suicidal’ and that other services such as telephone support or befriending services also have some impact.

Chemoprophylaxis in the context of suicide prevention can be thought of as the use of pharmacological agents in mental health conditions, which prevents suicidal behaviour or deliberate self harm. This is particularly important given that some antidepressants have been reported to cause suicidal ideation, especially in adolescents. At a population level there is some evidence that suicide rates are reduced, but this is not so for individual patients with depression. There is no good evidence that pharmacological treatment is effective at preventing suicide or deliberate self harm attempts in personality disorders, bipolar disorder or schizophrenia. As suicide is a rare event, trials are likely to be underpowered to pick up reduced suicide rates. The goal of antidepressant treatment is improvement in symptoms and functioning, rather than suicide prevention.

There is evidence that certain environmental measures are effective in reducing suicide rates. Interventions that have been 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. Other broader environmental strategies, such as media policies, school programs and education of the general public, may be effective, although there is no clear evidence to support this at present. Evidence from population studies strongly suggests that improving access to primary healthcare services in general, and mental health services in particular, will also reduce suicide rates. This is particularly important for Aboriginal and Torres Strait Islander people, who have been shown to access health services much less often than non-Indigenous Australians prior to a suicide attempt.
### Recommendations: Suicide prevention

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All people</td>
<td>Screening for suicide risk is not routinely recommended</td>
<td>N/A</td>
<td>IC</td>
<td>15,19</td>
</tr>
<tr>
<td></td>
<td>People with any one of the following:</td>
<td>Consider asking about past and current suicidal ideation and intent as part of a comprehensive medical history</td>
<td>Opportunistic</td>
<td>GPP</td>
<td>15,17</td>
</tr>
<tr>
<td></td>
<td>• past history of intentional self harm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• a history of mood disorders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• hazardous alcohol consumption or use of other recreational drugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All people</td>
<td>No specific behavioural interventions are recommended for prevention of suicide</td>
<td>N/A</td>
<td>IC</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>People at increased risk of suicide from history or clinical judgement</td>
<td>Consider local methods of enhancing effective contact with volunteer or professional agencies, particularly access to Aboriginal mental health workers</td>
<td>Ongoing</td>
<td>IIC</td>
<td>20</td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>All people</td>
<td>Medication is not recommended for the prevention of suicide beyond a clinically indicated use for diagnosed conditions (eg. major mental illness)</td>
<td>N/A</td>
<td>IB</td>
<td>21–24,27,28</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Communities</td>
<td>Remove access to lethal methods of suicide both in the community and the household</td>
<td>Ongoing</td>
<td>IC</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Communities</td>
<td>Advocate for community based health promotion programs that holistically address the multifactorial nature of social and emotional wellbeing (eg. sports events, caring for country programs, healthy lifestyle festivals)</td>
<td>Ongoing</td>
<td>GPP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>Provide education for primary care health professionals to recognise and respond to psychosocial distress and depression</td>
<td>Ongoing</td>
<td>IC</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>Integrating mental health services with alcohol and other drug services can improve service access to youth who are at risk of suicide</td>
<td>Ongoing</td>
<td>GPP</td>
<td>25</td>
</tr>
</tbody>
</table>

### Resources

- Australian Indigenous Mental Health (Royal Australian and New Zealand College of Psychiatrists)
  - [http://indigenous.ranzcp.org](http://indigenous.ranzcp.org)
- Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice
References


Chapter 11

Respiratory health

Pneumococcal disease, Influenza, Asthma, COPD
Author Penny Abbott
Expert reviewer Anne Chang

Bronchiectasis and Chronic suppurative lung disease
Author Anne Chang
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. It is carried by 50% of the population. It can cause noninvasive disease such as otitis media and bronchitis and can cause serious illness through invasive pneumococcal disease (IPD): diseases such as pneumonia, meningitis and septicaemia. Among infectious illnesses, IPD is a leading cause of morbidity and mortality in children and adults.1,2 Pneumococcal pneumonia is the most common clinical presentation of IPD in adults, while bacteraemia accounts for more than two-thirds of cases in children.2 Pneumonia commonly occurs in people with pre-existing illnesses, such as chronic obstructive pulmonary disease (COPD), chronic renal failure, alcoholism and diabetes, and deaths from pneumonia are most common in people with chronic respiratory disease or in the elderly.2 IPD in children is more common in those with immune deficiency and chronic disease.1

Aboriginal and Torres Strait Islander children and adults have a significantly higher incidence of all pneumococcal disease than non-Indigenous Australians, but detailed data are available only for IPD, which has been notifiable Australia wide since 2001.4 The risk of IPD in Aboriginal and Torres Strait Islander children under the age of 5 years is doubled and in young adults is raised 11-fold compared to non-Indigenous people. Pneumonia is the most common communicable disease contributor to premature death in Aboriginal adults.4 Hospitalisation for pneumonia is four times more common in Aboriginal and Torres Strait Islander people than in non-Indigenous Australians and up to eight times higher in younger Aboriginal and Torres Strait Islander adults.3,4

Interventions

Pneumococcal immunisation is indicated for those most at risk of initially contracting or developing serious complications from infection. Immunisation with the 23-valent pneumococcal polysaccharide vaccine (23vPPV) is funded for all Aboriginal and Torres Strait Islander people aged ≥50 years and for those aged 15–49 years who have high risk underlying conditions. These high risk conditions include being a current smoker, suffering alcohol related disease or having a chronic disease such as COPD, chronic renal failure or diabetes.3,5 A single revaccination is recommended after 5 years, and a second revaccination is recommended at either 5 years after the first revaccination or at 50 years of age (whichever is later) for those with high risk conditions.2 Although the Therapeutic Goods Administration issued precautionary advice early in 2011 not to administer a second dose of Pneumovax 23 due to concern regarding increased local reactions, the most recent statement at the time of writing now recommends to revaccinate as per previous advice.6

Despite these indications, the overall health benefits of pneumococcal vaccination in otherwise healthy adults remain uncertain. Vaccination appears to be most beneficial for people with chronic disease, particularly COPD and bronchiectasis.7–9 Pneumococcal immunisation is known to be effective in preventing invasive bacteraemic pneumococcal pneumonia, but may be less effective in immunosuppressed patients.3,7,10,11 Population level health benefits have been seen since pneumococcal immunisation of Aboriginal and Torres Strait Islander adults and children became funded nationally in 1999 and
2001 respectively. In 2004, the rate of IPD in children younger than 2 years had decreased in Indigenous children (91.5 per 100,000) to become similar to their non-Indigenous peers (93.6 per 100,000). The effects of pneumococcal vaccination on adults are not as substantial and clear as in children, and may be in part due to the indirect effects of improved herd immunity from childhood vaccination. There are ongoing studies into which vaccines are likely to be most effective in preventing pneumococcal disease in adults, and into the changing prevalence of different pneumococcal serotypes as a result of vaccination. Although this improvement in outcomes is encouraging, Aboriginal and Torres Strait Islander people of all ages continue to suffer higher rates of pneumococcal disease compared with non-Indigenous people, despite the immunisation programs in place.

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. 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 underimmunised for their age. 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. Surveillance studies in Queensland provide ‘circumstantial evidence’ for both indirect and direct positive effect of pneumococcal immunisation in Aboriginal and Torres Strait Islander adults, though there has been an accompanying rise in different serotypes of pneumococcal disease in adults.

There is a strong evidence base for the effectiveness of recall and reminder systems in promoting immunisation in primary care. Primary care, community based strategies to improve the uptake of adult pneumococcal vaccination are therefore recommended (see Chapter 2: Child health, for childhood vaccination recommendations).
### Recommendations: Pneumococcal disease prevention

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
</table>
| **Immunisation**            | Healthy adults aged ≥50 years  
See also Chapter 2: Child health, for childhood vaccination recommendations | Pneumococcal vaccine (23vPPV) is recommended for the prevention of invasive pneumococcal disease | Opportunistic  
A second vaccination is recommended 5 years later | GPP | 2,4,21 |
|                             | People aged 15–49 years who are smokers or have an underlying high risk conditions (e.g., chronic cardiac, renal or lung disease, diabetes, alcohol related problems, immunosuppression) | Pneumococcal vaccine (23vPPV) is recommended for the prevention of invasive pneumococcal disease | Opportunistic  
A second vaccination is required 5 years later  
A third vaccination is recommended 5 years later or at 50 years of age (whichever is later) | IIC | 2,3,6,11,22–24 |
| **Environmental**           | N/A             | Promote primary care, community based strategies to improve pneumococcal vaccination uptake and timeliness, particularly the implementation of reminder/recall systems | N/A | IA | 20,25 |
|                             | Communities     | Promote community awareness of benefits and timeliness of vaccines and enhancing access to vaccination services | N/A | IA | 20,25 |
Influenza prevention

Background

Influenza is a common respiratory disease caused by influenza A and B viruses. These viruses cause minor or major epidemics of seasonal influenza in most years, usually during the winter months. 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 people 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. There are calls for Aboriginal and Torres Strait Islander people to be acknowledged as a high risk group requiring specialised planning to manage future influenza outbreaks.

The consequences of influenza in children and healthy adults at low risk are mainly absenteeism from school and work. However, severe disease is more likely with advanced age, lack of previous exposure to antigenically related influenza virus, chronic conditions such as heart or lung disease, renal failure and diabetes, chronic neurological conditions, pregnancy and smoking.

Interventions

Administration of the current influenza vaccine before winter, provides protection against the disease and its complications in up to 70% of those who are vaccinated. Immunisation should be given annually, preferably in March to April before the Australian flu season.

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.

Recommendations for vaccination of all individuals over 65 years of age and all individuals over the age of 6 months with chronic disease is made on the basis of the higher risk of hospitalisation and complications from influenza in these groups. As yet there is limited and conflicting evidence on the effectiveness of influenza vaccination for people aged 65 years and over and for many groups of people with chronic disease, though the evidence is clearer that influenza vaccination is effective in decreasing complications in COPD and diabetes.

Influenza vaccination has been found to be effective in reducing infection in children. 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 under the age of 5 years, however the Therapeutic Goods Administration and the Australian Technical Advisory Group on Immunisation continued to recommend other brands of seasonal influenza vaccine for children for whom it was indicated. There is as yet limited evidence that influenza immunisation for healthy children leads to a reduction in community transmission of influenza. Influenza vaccination during pregnancy is recommended based on the increased morbidity and mortality of pregnant women who contract influenza, coupled with no evidence of harm from immunisation in pregnancy.
Australian guidelines recommend annual influenza vaccine should be given to all Aboriginal and Torres Strait Islander people aged 15 years and over in view of their substantially increased risk of hospitalisation and death from influenza and pneumonia. Effective strategies to promote influenza immunisation should be undertaken at a community level, particularly the use of recall and reminder systems, and should be tailored to the needs of the community concerned.

Infection control measures such as handwashing, particularly with young children, can be effective in preventing transmission of influenza. Healthcare providers can potentially transmit influenza to high risk patients and it has been shown that vaccinating the former protects those at high risk. Implementing barriers to transmission, such as isolation, and hygienic measures (wearing masks, gloves and gowns) can be effective in containing respiratory virus outbreaks or in hospital wards. The more expensive (but uncomfortable) N95 respirators might be superior to simple masks. It is unclear if adding virucidals or antiseptics to normal handwashing with soap is more effective.

Two classes of antiviral drugs are available for the treatment and prevention of influenza: the neuraminidase inhibitors, zanamivir and oseltamivir, which are active against both influenza A and B; and the adamantanes, amantadine and rimantadine, which are only active against influenza A. The neuraminidase inhibitors (NIs) oseltamivir (taken orally) and zanamivir (inhaled) are approved for use in Australia for the treatment and prevention of influenza A and B. Systematic reviews on the effectiveness of NIs for influenza prophylaxis in inter-pandemic years have come to conflicting conclusions. They generally show limited effectiveness in preventing influenza infection, its transmission and its complications in otherwise healthy adults. Consequently NIs are not recommended for the prevention of influenza in healthy adults. They may, however, have a role in the prophylaxis of at risk contacts of people with influenza, particularly during pandemics. Studies of post-exposure prophylaxis for 10 days have enrolled patients within 36–48 hours of exposure to a household contact, and have demonstrated a protective efficacy of 78–89% compared with expectant treatment at the onset of symptoms.

The decision to use NIs for prevention of influenza in at risk individuals depends on the assessment of the likelihood of influenza, the likely benefits of treatment based on the presence of comorbidities and the risk of developing complications. Treatment must be initiated early in order to maximise efficacy. When initiated promptly, antiviral therapy can shorten the duration of influenza symptoms by 1–3 days; the benefit is greatest when given within the first 24–30 hours and in patients with fever at presentation. Little to no benefit has been demonstrated when treatment is initiated 2 days or more after the onset of uncomplicated influenza.

The availability of antiviral drugs, including public health policies regarding the distribution of the national stockpile, is also taken into consideration in a pandemic situation. Post-exposure prophylaxis with NIs continues to be recommended for vulnerable Aboriginal and Torres Strait Islander household contacts during influenza outbreaks within communities.
## Recommendations: Influenza prevention

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunisation</td>
<td>All people aged ≥15 years</td>
<td>Offer influenza vaccine in the pre-flu season months for the prevention of influenza (March to April)</td>
<td>Annually</td>
<td>GPP</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Children with chronic illness aged 6 months to 14 years</td>
<td></td>
<td></td>
<td>IIC</td>
<td>2,11,31</td>
</tr>
<tr>
<td></td>
<td>Women who are pregnant or planning a pregnancy</td>
<td>Part of routine antenatal care (see Chapter 9: Antenatal care)</td>
<td></td>
<td>IIB</td>
<td>2,44</td>
</tr>
<tr>
<td></td>
<td>Healthcare providers</td>
<td></td>
<td></td>
<td>GPP</td>
<td>2,47</td>
</tr>
<tr>
<td></td>
<td>Children under 6 months of age</td>
<td>Influenza vaccination is not recommended</td>
<td></td>
<td>N/A</td>
<td>2</td>
</tr>
<tr>
<td>Behavioural</td>
<td>Household contacts of a person with influenza</td>
<td>Good hygiene practice, such as frequent handwashing and covering the mouth on coughing or sneezing, is recommended to decrease the spread of influenza, particularly to reduce transmission from children to other household members</td>
<td>Opportunistic</td>
<td>IIC</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Healthcare workers</td>
<td>Minimise exposure risk to patients with influenza-like illness by adhering to current infection control guidelines. In addition to standard infection control procedures, personal protective equipment is recommended during influenza pandemics</td>
<td></td>
<td>N/A</td>
<td>48,53</td>
</tr>
<tr>
<td>Chemoprophylaxis</td>
<td>Healthy adults</td>
<td>Neuraminidase inhibitors (NIs) are generally not indicated for the prevention of influenza</td>
<td>N/A</td>
<td>IIB</td>
<td>50,51</td>
</tr>
<tr>
<td></td>
<td>People at high risk of influenza complications, where there are high levels of circulating virus</td>
<td>Consider NIs for high risk individuals in close contact with someone with a proven case of influenza (ideally initiated within 48 hours), particularly in a pandemic situation or where there is high levels of circulating virus</td>
<td>Opportunistic</td>
<td>GPP</td>
<td>27,50,52</td>
</tr>
<tr>
<td>Environmental</td>
<td>N/A</td>
<td>Primary care, community based strategies to improve vaccination levels, particularly using reminder/recall systems, should be implemented</td>
<td>N/A</td>
<td>IB</td>
<td>20,25,33,45</td>
</tr>
<tr>
<td></td>
<td>Communities</td>
<td>Activities should also focus on increasing community awareness of benefits and timeliness of vaccines for vaccinations and enhancing access to vaccination services</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Asthma

Background

Asthma is a chronic inflammatory disease of the airways that is characterised by variable and recurring symptoms of airway obstruction and bronchial hyper-responsiveness, often reversible spontaneously or with treatment. The predominant features of the clinical history are episodic difficulty in breathing and shortness of breath often accompanied by cough.\(^{54,55}\) After many years, the reversibility of airflow limitation may be incomplete in some people with asthma due to airways remodelling.\(^{55}\) Asthma is commonly known as ‘short wind’ in some Aboriginal and Torres Strait Islander communities.\(^{56}\)

The diagnosis of asthma is a clinical one. When asthma is suspected on the basis of symptoms, spirometry, including reversibility testing, is the preferred initial test to determine the presence and severity of airways obstruction.\(^{57}\) Children over 7 years of age are usually able to perform spirometry. However, normal spirometry, particularly when the patient is not symptomatic, does not exclude asthma.\(^{56,57}\)

Asthma affects 15% of Aboriginal and Torres Strait Islander people, compared to 10% of the non-Indigenous Australian population.\(^{58,59}\) Compared with non-Indigenous Australians, Aboriginal and Torres Strait Islander people have twice the rate of hospitalisation and three times the rate of death due to asthma.\(^{59,60}\) Surveys indicate that asthma is 1.5–4 times more prevalent in Aboriginal and Torres Strait Islander people residing in non-remote areas compared to those in remote areas.\(^{60,61}\)

A long term solution to decreasing the burden of asthma may be early detection and prevention.\(^{62,63}\) However at this time few measures can be recommended for the prevention of asthma, as the underlying causes and the development of the disease are complex and incompletely understood.\(^{54}\)

What is meant by the prevention of asthma can be variable, with the terms primary and secondary prevention sometimes being used when referring to prevention of symptom exacerbations in people with an existing diagnosis of asthma through early treatment of exacerbations or long term control of disease.\(^{54,56}\) However, for the purposes of this review, the literature definitions of prevention of asthma have been followed. Primary prevention of asthma is defined as prevention of the onset of asthma and secondary prevention is defined as intervention(s) for infants and children who are at high risk for the development of asthma due to the presence of atopic disease but who have not yet developed asthma symptoms or signs.\(^{56,57,64}\) An exception to this is the primary prevention of occupational asthma through avoidance of asthma-causing agents in the work place.\(^{54,65}\)

It is accepted that environmental and lifestyle factors interact with genetic factors, such as an allergic tendency, to increase the risk of developing asthma.\(^{50,66,67}\) There is uncertainty about how to reliably predict an increased risk of asthma.\(^{54,56,62,67}\) Risk factors include a family history (particularly maternal) of asthma and allergies, and a past history of allergies in early life.\(^{63,64}\) Other risk factors for asthma that have been identified in observational studies are obesity, environmental pollution, work related exposures and diet.\(^{55,57}\) For people with high risk occupations, the presence of new onset rhinitis is associated with increased risk for occupational asthma.\(^{56}\)
Interventions to decrease the risk of developing asthma

The most important and modifiable risk factor to reduce asthma is exposure to environmental tobacco smoke (ETS).57,60,68–70 Interventions to reduce ETS exposure may reduce the risk of childhood asthma and later persistent asthma.55–57 This is of particular importance given the high rates of ETS exposure for Aboriginal and Torres Strait Islander children both in utero and after birth.60

There is currently little evidence to support preventive strategies to reduce the development of asthma except for avoidance of environmental tobacco smoke and avoidance of asthma causing agents in the workplace.60 There is conflicting evidence on the effects of exposure to pets and other allergen sources, the protective effects of breastfeeding and other aspects of diet and feeding in preventing childhood asthma.60

Sensitisation to allergens, such as house dustmite and cats, is associated with asthma, but interventions to reduce exposure to these allergens have not been shown to prevent asthma.66,67,71 Allergen specific immunotherapy may be effective in preventing asthma in children with seasonal allergies,67 though more studies are needed before this can be recommended as a wider strategy for prevention of asthma.57

The effect of breastfeeding on childhood asthma is controversial. Although there are many other health related benefits from breastfeeding, there does not appear to be any persistent effect of breastfeeding on asthma rates.56,70

A diet high in fruit and vegetable intake has been shown to be associated with less asthma in children and adults in observational studies.57,72 Other dietary interventions have not been shown to be effective in preventing asthma. Ineffective interventions include infant feeding with soy formulae73 and the avoidance of commonly allergenic foods during pregnancy and lactation or in infant diets.56,70 There is insufficient evidence that dietary supplements for mother or infant with probiotics, fish oil or antioxidants are of benefit in reducing childhood atopy or asthma.56,57,74–76

Similarly, there is insufficient evidence that avoidance of airborne allergens in the home and measures to reduce exposure to dustmite decrease the rates of asthma or wheeze in young children.56,74 Further, there is no evidence that house dustmite control prevents asthma exacerbations.71 Long term treatment with antihistamines does not reduce the risk of asthma developing in children with atopic dermatitis, including those who are sensitive to house dustmite and/or grass pollen.56 Immunotherapy may reduce asthma risk in children with seasonal rhinoconjunctivitis,56,67,71,78 however more studies are needed before this can be recommended as a preventive strategy for asthma.57

Reducing exposure to potential environmental factors including allergens in the workplace may decrease a worker’s risk of developing asthma in the workplace. Reduction in exposure levels including the use of respiratory protective equipment reduces but does not eliminate the risk of occupational asthma.56,79,80
### Recommendations: Asthma

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All people</td>
<td>Routine screening for asthma is not recommended Early detection strategies should be considered (e.g., clinical vigilance, detailed history considering mimics of asthma, and spirometry when symptoms are suggestive)</td>
<td>N/A</td>
<td>GPP</td>
<td>81</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>Children</td>
<td>Maternal dietary restrictions during breastfeeding or pregnancy are not recommended for the prevention of asthma</td>
<td>Opportunistic</td>
<td>IIIB</td>
<td>56,57,68</td>
</tr>
<tr>
<td></td>
<td>All people</td>
<td>A high intake of fruit and vegetables should be recommended to those with or at risk of asthma*</td>
<td>Opportunistic</td>
<td>IIIB</td>
<td>57</td>
</tr>
<tr>
<td><strong>Chemo-prophylaxis</strong></td>
<td>Children with seasonal rhino-conjunctivitis</td>
<td>Advise that immunotherapy is not currently recommended as a preventive strategy of asthma</td>
<td>N/A</td>
<td>IIB</td>
<td>56,57,67,77,78</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>Children</td>
<td>Strategies to provide a smokefree environment are recommended Smoking cessation advice should be given to pregnant and breastfeeding women (see Chapter 9: Antenatal care)</td>
<td>Opportunistic</td>
<td>IIIA</td>
<td>54,56,57</td>
</tr>
<tr>
<td></td>
<td>Workers in high risk workplaces, where exposure to occupational dusts and chemicals are likely</td>
<td>Recommend use of respiratory protective equipment</td>
<td>N/A</td>
<td>IIIB</td>
<td>56,79,80</td>
</tr>
</tbody>
</table>

* 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 birthweight, in utero tobacco exposure, tobacco smoking, environmental tobacco smoke, environmental pollution and work related exposures55,57,63,64,81

### Resources

- **British Guideline on the Management of Asthma (British Thoracic Society, Scottish Intercollegiate Guidelines Network)**  

- **Multiple resources including guides to asthma management and spirometry (National Asthma Council Australia)**  
  [www.nationalasthma.org.au](http://www.nationalasthma.org.au)

- **International evidence based guidelines and clinical resources (Global Initiative for Asthma)**  
  [www.ginasthma.org](http://www.ginasthma.org)
Chronic obstructive pulmonary disease

Background

Chronic obstructive pulmonary disease (COPD) is a serious, progressive and disabling disease and a major cause of hospital admission and premature death in Australia. Some 2 million Australians are estimated to have COPD. The death rate from COPD among Aboriginal and Torres Strait Islander people is five times that of non-Indigenous Australians. Tobacco smoking is the major cause of COPD. Half of Aboriginal and Torres Strait Islander people report that they smoke and daily smoking is twice as prevalent when compared with non-Indigenous Australians. Further, environmental tobacco smoke (ETS) exposure appears to be a risk factor for the development of COPD.

COPD is characterised by airflow limitation that is not fully reversible and is usually progressive. A clinical diagnosis of COPD should be considered in any patient who has dyspnoea, chronic cough or sputum production, and a history of tobacco smoking. The diagnosis of COPD requires demonstration by spirometry of airflow limitation that is not fully reversible, in addition to symptoms of dyspnoea and cough and exposure to risk factors for the disease such as smoking. The presence of a postbronchodilator FEV1/FVC <0.70 and FEV1 <80% predicted confirms the presence of airflow limitation that is not fully reversible.

Spirometry in association with clinical symptoms can be used to classify COPD into:

- mild disease (Stage I: FEV1/FVC <0.70 and FEV1 >80% predicted)
- moderate disease (Stage II: FEV1/FVC <0.70 and FEV1 50–80% predicted)
- severe disease (Stage III: FEV1/FVC <0.70 and FEV1 30–50% predicted), and
- very severe disease (Stage IV: FEV1/FVC <0.70 and FEV1 <30% predicted or FEV1 <50% predicted plus chronic respiratory failure).

COPD is commonly associated with other diseases, including heart disease, obstructive sleep apnoea, lung cancer, stroke and depression, which should be actively identified and also carefully managed.

Interventions

There is no evidence of an effective screening test for the early detection of COPD in asymptomatic individuals. Spirometry has not been demonstrated to improve health outcomes and there is no evidence that spirometry screening improves smoking cessation rates. Spirometry is therefore not recommended as a screening test but is required for diagnosis in symptomatic individuals.

The single most important intervention to prevent or reduce the progression of COPD for most people is smoking cessation and therefore strenuous efforts should be made to assist smokers with COPD to quit smoking. Similarly, other risk factors for COPD should be reduced such as occupational dusts and chemicals, and indoor and outdoor air pollutants.

No medications have been shown to modify the steady decline of lung function, which is the hallmark of COPD. For people with an established diagnosis of COPD, much can be done, however, to improve quality of life, increase
exercise capacity and reduce morbidity and mortality.\textsuperscript{11,85} The principal goals of other therapy, aside from smoking cessation, are to optimise function through symptom relief with medications and pulmonary rehabilitation and to prevent or treat aggravating factors and complications.\textsuperscript{11} Mild to moderate COPD is likely to be treated within primary care, but patients with more severe COPD require multidisciplinary team care including consideration of pulmonary rehabilitation.\textsuperscript{91} Pulmonary rehabilitation reduces dyspnoea, fatigue, anxiety and depression, improves exercise capacity, emotional function and health related quality of life and enhances patients’ sense of control over their condition.\textsuperscript{11,22,23,91}

There is good evidence of benefit from annual influenza vaccination in people with COPD, with a demonstrable reduction in hospitalisations, complications and death.\textsuperscript{11,23,37} Influenza vaccination should therefore be given in early autumn to all patients with moderate to severe COPD.\textsuperscript{11} There is no direct evidence of the efficacy of pneumococcal vaccine in preventing pneumococcal exacerbations of COPD.\textsuperscript{24} There is however, evidence of benefit in elderly populations with or without chronic disease.\textsuperscript{22} Consequently pneumococcal vaccination (polyvalent covering 23 virulent serotypes) is recommended in this group.\textsuperscript{11}

Despite the fact that medications cannot reverse or slow the deterioration in lung function in COPD, they have an important role in symptom control and management of complications. Both long acting anticholinergic agents and long acting beta agonists (LABAs) have proven effectiveness in symptom control for COPD. Evidence is insufficient to recommend one over the other.\textsuperscript{92} Inhaled corticosteroids (ICS) should be considered in patients with moderate to severe COPD and frequent exacerbations.\textsuperscript{11,85} While the long term adverse effects of ICS are unknown, caution is needed if treatment is stopped as abrupt withdrawal may be associated with worsening of symptoms.\textsuperscript{11} Combination inhaled therapies (ICS, LABA, long acting anticholinergics) may be appropriate in symptomatic people. The decision to use combination treatment and which agents to use should take into account the patient’s symptomatic response, personal preference and risk of side effects.\textsuperscript{91}

Prophylactic antibiotics in chronic bronchitis/COPD have a small but statistically significant effect in reducing the days of illness due to exacerbations of chronic bronchitis. However, they do not have a place in routine treatment because of concerns about the development of antibiotic resistance and the possibility of adverse effects. Similarly, mucolytics may reduce the frequency and duration of exacerbations but are not indicated for routine use.\textsuperscript{11,91}
### Recommendations: Chronic obstructive pulmonary disease

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immunisation</strong></td>
<td>People with an established diagnosis of COPD</td>
<td>Offer influenza vaccine in the pre-flu season months for the prevention of influenza (March to April)</td>
<td>Annually</td>
<td>IIB</td>
<td>11,91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pneumococcal vaccine (23vPPV) is recommended for the prevention of invasive pneumococcal disease</td>
<td></td>
<td></td>
<td>2,11,23,91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See section on pneumococcal vaccination for recommendations on frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Screening</strong></td>
<td>Current smokers Ex-smokers over 35 years of age</td>
<td>Screen for symptoms of COPD (persistent cough/sputum production, wheezing, dyspnoea)</td>
<td>Opportunistic</td>
<td>IIB</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If symptoms are present spirometry is indicated to assess for COPD</td>
<td></td>
<td></td>
<td>11,22,87,88, 91–93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spirometry is not recommended to screen healthy adults who do not report respiratory symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chest X-ray is not recommended for the diagnosis or screening of COPD</td>
<td></td>
<td></td>
<td>GPP 22,91</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chest X-ray may be of value to rule out other diagnoses and for later use as a baseline</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All people</td>
<td>Advise of the importance of not smoking as the most effective strategy to prevent COPD (see Chapter 1: Lifestyle, smoking)</td>
<td>Opportunistic</td>
<td>IA</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoking cessation reduces the rate of decline of lung function. Counselling and treatment of nicotine dependence should be offered to all smokers regardless of the presence or absence of airflow obstruction (see Chapter 1: Lifestyle, smoking)</td>
<td></td>
<td></td>
<td>11,23,87</td>
</tr>
<tr>
<td></td>
<td>People with an established diagnosis of COPD</td>
<td>Pharmacotherapy (bronchodilator treatment, inhaled corticosteroids, long term antibiotic treatment) does not modify decline in lung function Pharmacotherapy is useful in decreasing symptoms and/or complications and improving quality of life</td>
<td>Opportunistic</td>
<td>IA</td>
<td>11,23</td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>People with an established diagnosis of COPD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td>All people</td>
<td>Advise that risk factors for COPD should be minimised (eg. occupational exposure, ETS and indoor/outdoor air pollution and irritants). This may include strategies such as adequate ventilation when cooking with solid fuels and avoidance of irritants and reduction of emissions in the workplace</td>
<td>N/A</td>
<td>III C</td>
<td>23,84</td>
</tr>
</tbody>
</table>
Resources
Screening for chronic obstructive pulmonary disease using spirometry
www.uspreventiveservicestaskforce.org/uspstf/uspscopd.htm
The COPD-X Plan. Australian and New Zealand guidelines for the management of chronic obstructive pulmonary disease
www.copdx.org.au
Inhaler technique in adults with asthma or COPD
Chronic obstructive pulmonary disease: diagnosis and management of acute exacerbations
www.guideline.gov/syntheses/synthesis.aspx?id=16404
Diagnosis and management of stable chronic obstructive pulmonary disease
www.guideline.gov/syntheses/synthesis.aspx?id=16403
Chronic obstructive pulmonary disease: pulmonary rehabilitation
www.guideline.gov/syntheses/synthesis.aspx?id=16423
Management of chronic obstructive pulmonary disease in adults in primary and secondary care (partial update)
www.guideline.gov/content.aspx?id=23860&search=asthma+and+prevention
Chronic obstructive pulmonary disease
Bronchiectasis and chronic suppurative lung disease

Background

The customary diagnosis of bronchiectasis, usually defined as irreversible airway dilatation, is based solely on high-resolution chest computed tomography scans (HRCT). The use of a radiological definition is problematic for several reasons, particularly clinically for Aboriginal and Torres Strait Islander people living in remote areas. Thus, in the clinical guideline specific for Aboriginal and Torres Strait Islander people living in remote regions and the national guidelines, the preferable term is chronic suppurative lung disease (CSLD) when symptoms and/or signs of bronchiectasis are present with or without HRCT features. These symptoms and/or signs are: continuous, wet or productive cough for >8 weeks ± other features such as exertional dyspnoea, reactive airway disease, recurrent chest infections, growth failure, clubbing, hyperinflation or chest wall deformity. Bronchiectasis refers to CSLD with the presence of HRCT radiological features.

The incidence of CSLD has declined over the past century. However, in the past decade, it is increasingly recognised as an important contributor to chronic respiratory morbidity in both Aboriginal and Torres Strait Islander people and other children and adults in Australia and globally. It is also increasingly recognised as an alternative or concomitant diagnosis to common respiratory conditions such as ‘difficult asthma’ and COPD. Two studies have described a prevalence of bronchiectasis in COPD at 29% and 50%. In a cohort of newly referred adults with ‘difficult asthma’, bronchiectasis was detected in 40%.

In Aboriginal and Torres Strait Islander people, CSLD 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 and the prevalence is 1 in every 68 children aged <15 years. Hospitalisation rates for CSLD is increasing in Queensland (age standardised rate of ~65 per 100 000 in 2005 to ~90 per 100 000 in 2009), with the rate in Aboriginal and Torres Strait Islander people about 2.7 times that for non-Indigenous Queenslanders in 2009. There are no data for urban dwelling Aboriginal and Torres Strait Islander people but 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.

The morbidity of people with bronchiectasis include increased hospitalisation, excess days off work/school, poor quality of life and complications associated with chronic cough. Complications associated with bronchiectasis extend beyond the respiratory system and include cardiac problems (eg. impaired left ventricular diastolic function, cor pulmonale, systemic effects (eg. reduced wellbeing and increased acute phase reactants), sleep disturbance and psychological difficulties associated with anxiety and depression. Furthermore, chronic endobronchial infection, which is present in CSLD, is an independent risk factor for atherosclerosis, coronary heart disease and coronary deaths.
The only published Australian mortality data for bronchiectasis are from a central Australian hospital based cohort of 61 adults (97% were Aboriginal) in which 11.5% of people had died within 12 months. The cohort comprised predominantly middle aged adults (mean age 42 + SD 15 years) and most had not received standard care: only 13 (21.3%) had lung function tests performed. Overseas, mortality rates vary widely from a 4 year survival of 58% (Turkey) to 75% survival at 8.8 years (Finland).

Interventions

Despite the considerable prevalence and disease burden, services for CSLD receive disproportionately fewer allocated resources when compared with other chronic respiratory diseases. Effective clinical management reduces both short and long term morbidity associated with CSLD. 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. 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 CSLD) 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 1 second (FEV1). Optimal overall management and treatment can potentially prevent chronic respiratory disease in a substantial number of people. Although robust trials are needed, primary healthcare providers can play a crucial role in the recognition and early detection of disease as well as the long term management to prevent complications and premature death.

Immunisation (pneumococcal, influenza) is effective in preventing severe and recurrent acute respiratory illnesses (ARIs), however data of its effectiveness specific to the Aboriginal and Torres Strait Islander health context are lacking. Delayed immunisation is one postulate why pneumococcal conjugate-7 vaccine has not reduced ARIs in Aboriginal and Torres Strait Islander children. This is in contrast to global data that have shown substantial ARI reduction post pneumococcal vaccination.

Aboriginal and Torres Strait Islander children hospitalised with pneumonia were 15 times more likely to develop bronchiectasis and for recurrent pneumonia the risk increases further. In a cohort study, 25.6% of children with hospitalised lobar pneumonia had a new diagnosed and treatable chronic respiratory illness (18% CSLD) on follow up. Thus, given the link between lower ARIs and bronchiectasis, as well as the association between duration of chronic cough and lung function decline in adults, it is good clinical practice for all children and adults with lower ARIs to be reviewed in primary care at least 3–4 weeks post episode. 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 S. pneumoniae, Moraxella catarrhalis, H. 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 2 weeks was three. Further, progression of illness, defined by requirement for further antibiotics, was significantly lower in the treatment group; number needed to treat was four.
The most common symptom of CSLD is chronic cough and recent unpublished data have shown that Aboriginal and Torres Strait Islander children newly referred with chronic cough have a significantly higher likelihood of bronchiectasis on further assessment. As chronic cough is considered ‘normal’, it tends to be under reported by carers of Aboriginal children. Anecdotally, adult Aboriginal and Torres Strait Islander people also underreport their cough. In children, triggers for referral to a specialist include >2 episodes of chronic (>4 weeks) wet cough per year responding to antibiotics, and chest X-ray abnormality persisting >6 weeks following appropriate therapy.

Frequent exacerbations, especially when hospitalisation is required, is a risk factor for lung function decline. Thus, when exacerbations are frequent (4–6 per year non-hospitalised episodes or 2 per year hospitalised episodes), consider use of maintenance antibiotics in collaboration with a specialist.

Exposure to in-utero tobacco smoke is associated with lower birthweight, increased ARI and other respiratory morbidity. Breastfeeding is protective against development of CSLD while being born premature or small for gestation is a risk factor. Primary prevention strategies to reduce these factors and increase breastfeeding would be beneficial (see Chapter 2: Child health). The association between poor hygiene and the excessive burden of infections (especially respiratory and gastrointestinal) has been well demonstrated. However, data specific to Aboriginal and Torres Strait Islander people as well as evidence based interventions are sparse (see Chapter 9: Hearing loss).
### Recommendations: Bronchiectasis and chronic suppurative lung disease

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunisation</td>
<td>All children and adults</td>
<td>Ensure timely immunisation is provided</td>
<td>As per National Immunisation Program Schedule (NIPS) and state/territory schedules</td>
<td>IA</td>
<td>94</td>
</tr>
<tr>
<td>Screening</td>
<td>People with pneumonia and lower acute respiratory infections (ARIs), particularly hospitalised episodes</td>
<td>Ensure primary care provider review after the ARI episode If wet or productive cough* is present, consider the diagnosis of CSLD.† Recommence antibiotics and undertake investigations as per management guidelines94</td>
<td>3–4 weeks post episode then 2 weekly till symptoms resolve or referred</td>
<td>IA (antibiotics efficacy in treatment of wet cough in children) IIIIB (screening for CSLD post lower ARI episode)</td>
<td>130–132</td>
</tr>
<tr>
<td></td>
<td>People with recurrent lower ARIs (particularly if hospitalised)</td>
<td>Consider a diagnosis of CSLD. Repeat chest X-ray. Refer to specialist if: • &gt;2 episodes of chest X-ray proven pneumonia and/or • chest X-ray persistently abnormal for &gt;6 weeks</td>
<td>Opportunistic</td>
<td>III (screening for CSLD post lower ARI episode)</td>
<td>94,130</td>
</tr>
<tr>
<td></td>
<td>People with persistent chronic (&gt;2 months) wet cough</td>
<td>Consider a diagnosis of CSLD. Assess with a chest X-ray and see above If wet or productive cough* is present, consider the diagnosis of chronic suppurative lung disease.† Recommence antibiotics and undertake investigations as per management guidelines94</td>
<td>Annually</td>
<td>IA (antibiotics efficacy in treatment of wet cough in children) GPP B (for effectiveness of screening and antibiotics in adults)</td>
<td>94,132</td>
</tr>
<tr>
<td>Behavioural</td>
<td>All infants</td>
<td>Promote and encourage breastfeeding</td>
<td>At postnatal checks</td>
<td>IIIIB (breastfeeding protective)</td>
<td>94,130</td>
</tr>
<tr>
<td></td>
<td>All children</td>
<td>Promote good hygiene practices to reduce burden of infections (see Chapter 7: Hearing loss)</td>
<td>Opportunistic</td>
<td>GPP B</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>People with CSLD or known bronchiectasis</td>
<td>Assess cough severity, quality of life, and exacerbating factors. Undertake regular review to prevent and manage complications and comorbidities (see Table 11.1)</td>
<td>3 monthly clinic review 6 monthly specialist review</td>
<td>GPP B</td>
<td>94,95</td>
</tr>
</tbody>
</table>
**Recommendations: Bronchiectasis and chronic suppurative lung disease (continued)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Action</th>
<th>Guidelines</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants at risk of exposure to environmental tobacco smoke both in-utero and in the postnatal period</td>
<td>Advise and assist pregnant women to avoid smoking (see Chapter 9: 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) (see Chapter 1: Lifestyle, smoking)</td>
<td>Opportunistic</td>
<td>IIIC</td>
<td>135,136</td>
</tr>
<tr>
<td>Mothers with or at risk of having babies with low birthweights and/or premature infants</td>
<td>Promote increased access to comprehensive antenatal care (see Chapter 9: Antenatal care)</td>
<td>Opportunistic</td>
<td>GPP IIIIC (premature and low birthweight infants developing CSLD)</td>
<td>94,130</td>
</tr>
<tr>
<td>Chemoprophylaxis</td>
<td>People with CSLD or known bronchiectasis</td>
<td>Consider maintenance antibiotics on discussion with the person’s specialist</td>
<td>As per management guidelines</td>
<td>GPP C</td>
</tr>
</tbody>
</table>

* Cough is usually underreported; 40 children do not usually produce sputum and hence the term wet cough (rather than productive cough) is used94
† Bronchiectasis refers to chronic suppurative lung disease (CSLD) with the presence of high resolution chest CT (HRCT) radiological features.95 CSLD is diagnosed when symptoms and/or signs of bronchiectasis are present with or without HRCT features.95 These symptoms and/or signs are: continuous, wet or productive cough for >8 weeks, ± other features such as exertional dyspnoea, reactive airway disease, recurrent chest infections, growth failure, clubbing, hyperinflation or chest wall deformity.95

---

**Table 11.1. Regular review of bronchiectasis**

Regular review consists of:
- assessment of severity, which includes oximetry and spirometry
- sputum culture
- management of possible complications and comorbidities, particularly for gastro-oesophageal reflux disease, reactive airway disease/asthma, COPD, otolaryngological disorders and dental disease. Less commonly patients require assessments for sleep disordered breathing, cardiac complications and referral for lung transplantation

Source: Chang AB, Bell SC, Byrnes CA, Grimwood K, Holmes PW, King PT, et al 201095
Resources

Resources for health professionals (Lung Foundation)
www.lungfoundation.com.au

Lung InfoNet

References


22. Management of COPD Working Group. VA/DoD clinical practice guideline for the management of...


45. Thomas RE, Russell M, Lorenzetti D. Interventions to increase influenza vaccination rates of those 60 years and older in the community. Cochrane Database Syst Rev 2010;Sep 8(9):CD005188.


97. Kapur N, Masters IB, Chang AB. Longitudinal growth and lung function in pediatric non-CF.


Chapter 12

Cardiovascular disease prevention

Author David Peiris
Expert reviewers Alex Brown, Andrew Tonkin
Overview

In this chapter cardiovascular disease (CVD) is used as a collective term to include coronary heart disease (CHD), stroke and transient ischaemic attacks (TIAs) and peripheral vascular disease (PVD).

Despite improving trends, CVD remains Australia’s biggest killer, accounting for 16% of the total disease burden and 11% of national health system expenditure. Aboriginal and Torres Strait Islander people experience around a five times greater vascular disease burden than other Australians. This vascular disease burden rises sharply from early adulthood. Mortality rates from CVD for Aboriginal and Torres Strait Islander people aged 25–64 years are up to eight times higher than for the general population, and CVD is the single biggest contributor to the disease burden gap for those aged 35 years and older. Reductions in the prevalence of seven risk factors (tobacco smoking, high body mass, physical inactivity, high blood cholesterol, excessive alcohol intake, high blood pressure, and low fruit and vegetable intake) represent the most effective prevention strategies in closing the vascular disease burden gap for Aboriginal and Torres Strait Islander people. Based on the National Health Survey and the National Aboriginal and Torres Strait Islander Health Survey, nearly all Aboriginal and Torres Strait Islander people have at least one CVD risk factor from the age of 18 years and 53% have three or four of these risk factors.

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 (e.g., hypertension or hypercholesterolaemia, in which arbitrary cut-points are used for defining presence or absence of a condition) towards 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 CVD event than the traditional single risk factor approach.

The contribution of various risk factors to a person’s overall risk is derived from large cohort studies and several absolute CVD risk prediction equations are now available based on these data. Importantly, however, there are currently no Aboriginal and Torres Strait Islander population specific risk prediction equations. The 1991 Anderson Framingham Risk Equation (FRE), derived from the USA Framingham study, is the currently recommended equation for risk estimation in Australia. This equation should only be applied for people without established CVD.

There are several limitations to applying the FRE to Aboriginal and Torres Strait Islander populations:

- it is validated for the age range 30–74 years only
- it may underestimate risk, especially for younger age groups and when local risk factor prevalence rates and CVD incidence exceed that of non-Indigenous populations
- 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, markers of chronic kidney disease, socioeconomic hardship, depression and psychosocial stress, and impaired fasting glucose. Further, literature reviews conducted by the National Vascular Disease Prevention Alliance have identified several clinical conditions which, if present, confer a high degree of risk regardless of the risk estimate using the FRE. Table 12.1 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 in whom absolute risk calculation can be assumed to be high. It is recommended that a comprehensive vascular risk assessment requires assessment of all these factors.

### Table 12.1. Framingham and non-Framingham CVD risk factors

<table>
<thead>
<tr>
<th>Framingham risk equation factors†</th>
<th>Non-Framingham risk equation factors‡</th>
<th>Clinically high risk conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Obesity (BMI &gt;30 kg/m² and/or waist circumference &gt;102 cm in men, &gt;88 cm in women)</td>
<td>• Extreme risk factor elevations (SBP ≥180 or DBP ≥110, total cholesterol &gt;7.5 mmol/L)</td>
</tr>
<tr>
<td>Gender</td>
<td>Family history of CVD before age 55 years in a mother, father or sibling</td>
<td>• Type 2 diabetes and age &gt;60 years</td>
</tr>
<tr>
<td>Smoking status</td>
<td>Presence of albuminuria§</td>
<td>• Type 2 diabetes and albuminuria*</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td>Atrial fibrillation</td>
<td>• Moderate to severe chronic kidney disease (eGFR &lt;45 mL/min/1.73 m² or persistent proteinuria)</td>
</tr>
<tr>
<td>Total cholesterol§</td>
<td>Impaired fasting glucose ≥6.1 mmol and &lt;7.0 mmol or glucose intolerance (2 hour glucose ≥7.8 mmol and ≤11.0 mmol)</td>
<td>• Familial hypercholesterolaemia</td>
</tr>
<tr>
<td>HDL cholesterol§</td>
<td>Socioeconomic hardship</td>
<td></td>
</tr>
<tr>
<td>Diabetes status</td>
<td>Depression or other psychosocial stress</td>
<td></td>
</tr>
<tr>
<td>Left ventricular hypertrophy (LVH)†</td>
<td>Excessive alcohol intake</td>
<td></td>
</tr>
</tbody>
</table>

* The 1991 Framingham risk equation is intended for people without CVD. The most recently recorded pre-treatment measures for blood pressure 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

‡ 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 Table 12.1

§ Fasting lipid specimens are recommended, but a reasonable estimation of risk will be obtained from a non-fasting sample in most circumstances

# 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


### 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 people, the following recommendations have been made. The following tables outline the recommendations for people without CVD and for those with established CVD.
### Recommendations: For people without an established diagnosis of CVD

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>Age 12–17 years</td>
<td>Assess smoking status, physical activity, nutrition, BMI and waist circumference (see Chapter 1: Lifestyle)</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>GPP</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Age 18–34 years without any vascular risk factors</td>
<td>Assess smoking status, physical activity, nutrition, BMI and waist circumference. Also assess BP, family history of premature CVD, diabetes risk (see Chapter 14: Diabetes prevention), psychosocial risk factors (see Chapter 10: Mental health) and socioeconomic risk factors</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>GPP</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Age 18–34 years and one or more of the following is present: family history of premature CVD or chronic kidney disease (CKD), overweight/obesity, smoking, diabetes, elevated BP</td>
<td>Assess risk factors as above* Also assess serum lipids and screen for CKD (see Chapter 13: Chronic kidney disease prevention and management)</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>GPP</td>
<td>9–11</td>
</tr>
<tr>
<td></td>
<td>Age 35–74 years</td>
<td>Assess for the presence of any Framingham, non-Framingham risk factors and clinically high risk conditions (see Table 12.1) If no clinically high risk conditions are present then calculate absolute 5 year CVD risk using the Australian cardiovascular risk charts (Appendix 1) or the Framingham risk equation (FRE) calculator (see Resources)</td>
<td>As part of an annual health assessment and review according to level of risk (see below)</td>
<td>IIB</td>
<td>7,12–15</td>
</tr>
<tr>
<td></td>
<td>Age over 74 years</td>
<td>Assess for presence of any Framingham, non-Framingham risk factors and clinically high risk conditions (see Table 12.1) but assume CVD risk is high</td>
<td>Review according to clinical context</td>
<td>GPP</td>
<td>14,15</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>People with low absolute 5 year CVD risk (&lt;10%)</td>
<td>Advise lifestyle risk reduction as needed for the following (see Chapter 1: Lifestyle): • physical activity • weight loss • smoking cessation • salt reduction to less than 4 g salt/day (1600 mg sodium/day) • diet rich in fruit and vegetables, wholegrain 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</td>
<td>Review risk every 2 years</td>
<td>IA</td>
<td>9,14,16–19</td>
</tr>
</tbody>
</table>
### Chemoprophylaxis

<table>
<thead>
<tr>
<th>People with the following:</th>
<th>Advise lifestyle risk reduction as above. Provide intensive intervention support (see Chapter 1: Lifestyle)</th>
<th>Review according to clinical context</th>
<th>IB</th>
<th>9,11,14,15, 20–22</th>
</tr>
</thead>
</table>
| • absolute 5 year CVD risk moderate or high (≥10%)  
• presence of any clinically high risk conditions (see Table 12.1) | | | | |

**Chemoprophylaxis**

People at low absolute risk:

- <10% 5 year CVD risk and with BP persistently ≥160/100 mmHg

Consider commencing a BP lowering medication unless contraindicated

Review according to clinical context

GPP 14

People at moderate absolute risk:

- 10–15% 5 year CVD risk

Review individual risk factor profile and recommend commencing a BP lowering medication and/or lipid lowering medication unless contraindicated**

Review according to clinical context

IB 9,11,14,15, 20–22

People at high absolute risk:

- >15% 5 year CVD risk or presence of any clinically high risk conditions (see Table 12.1)

Recommend commencing both a BP lowering medication and lipid lowering medication regardless of risk factor levels unless contraindicated**

Review according to clinical context

IB 9,11,14,15, 20–22

Aspirin is not routinely recommended

IC 14

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 two or more of the following risk factors are present (based on the CHADS2 score23):

- Congestive heart failure
- Hypertension
- Age >75 years
- Diabetes
- prior Stroke or TIA

Review according to clinical context

IA 12,24–26

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* Although absolute CVD risk assessment is currently not recommended in Aboriginal and Torres Strait Islander people aged less than 35 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.

** Specific choice of BP and lipid lowering agents and guidelines on treatment targets is beyond the scope of this guideline. See Resources for links to specific management guidelines. If BP or lipid levels are extreme or non-responsive to treatment then further investigation for underlying causes is recommended.
### Recommendations: For people with an established diagnosis of CVD

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>People with CVD</td>
<td>Calculation of the absolute CVD risk using the FRE calculator is not recommended. Five year risk of a subsequent CVD event is assumed to be high</td>
<td>N/A</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>People with CVD</td>
<td>Intensive lifestyle risk factor management as for patients without an established diagnosis of CVD (see Table 12.1)</td>
<td>Review at every visit</td>
<td>1A 9,13,14,16–19</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A tailored cardiac rehabilitation program should be offered to all people post myocardial infarction (MI) and other acute coronary syndromes, and to those who have undergone revascularisation procedures</td>
<td>Post CVD event</td>
<td>1A</td>
<td></td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>People with CVD</td>
<td>Commence BP lowering treatment at any BP level unless there is symptomatic hypotension*</td>
<td>Lifelong</td>
<td>IA 9,13,27</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commence lipid lowering treatment with a statin at any cholesterol level unless contraindicated*</td>
<td>Lifelong</td>
<td>IA 11,13,27</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commence low dose aspirin treatment (75–150 mg) unless contraindicated</td>
<td>Lifelong</td>
<td>IA 13,27–29</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consider alternative antiplatelet agents such as clopidogrel (75 mg) if aspirin hypersensitivity is present</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stent insertion</td>
<td>Consider clopidogrel (75 mg) in combination with aspirin</td>
<td>For 12 months post stent insertion depending on stent type and circumstances of implantation</td>
<td>IIB 27,29</td>
<td></td>
</tr>
<tr>
<td>People with CHD</td>
<td>Stent insertion</td>
<td>Oral anticoagulant treatment is recommended if AF or cardio-embolic stroke is present unless contraindicated. Consultation of specific management guidelines is recommended (see Resources)</td>
<td>Lifelong</td>
<td>IA 13,26,30</td>
<td></td>
</tr>
</tbody>
</table>

* Specific choice of BP and lipid lowering agents and guidelines on treatment targets is beyond the scope of this guideline. See Resources for links to specific management guidelines. If BP or lipid levels are extreme or non-responsive to treatment then further investigation for underlying causes is recommended.
Resources
For absolute risk calculation consult:
The Australian cardiovascular risk charts (see Appendix 1) and www.heartfoundation.org.au/SiteCollectionDocuments/aust-cardiovascular-risk-charts.pdf
Calculators embedded in clinical software programs
Framingham Risk Equation calculator www.cvdcheck.org.au
For blood pressure and lipid management guidelines consult:
For oral anticoagulant management recommendations consult:
Therapeutic Guidelines: Cardiovascular.

References


Section 13

Chronic kidney disease prevention and management
Overview

Chronic kidney disease (CKD) is defined as either kidney damage or glomerular filtration rate (GFR) less than 60 mL/min/1.73 m², or both, persisting for at least 3 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 13.1.1,2 Note that Stage 2 CKD requires evidence of kidney damage in addition to reduced GFR, whereas Stages 3A–5 are defined entirely on the basis of measured GFR.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>GFR (mL/min/1.73 m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kidney damage* with normal or increased GFR</td>
<td>&gt;89</td>
</tr>
<tr>
<td>2</td>
<td>Kidney damage* with mild reduced GFR</td>
<td>60–89</td>
</tr>
<tr>
<td>3A</td>
<td>Moderately reduced GFR</td>
<td>45–59</td>
</tr>
<tr>
<td>3B</td>
<td>Moderately reduced GFR</td>
<td>30–44</td>
</tr>
<tr>
<td>4</td>
<td>Severely reduced GFR</td>
<td>15–29</td>
</tr>
<tr>
<td>5</td>
<td>Kidney failure</td>
<td>&lt;15 or dialysis</td>
</tr>
</tbody>
</table>

* Kidney damage includes pathological abnormality or a marker of damage such as abnormalities in blood tests, urine tests or imaging studies 1

Aboriginal and Torres Strait Islander people have a greatly increased prevalence of CKD,3 and are approximately 10 times more likely than non-Indigenous Australians to develop end stage kidney failure.4 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.5 Rates also correlate strongly with socioeconomic disadvantage.6 The reasons are multifactorial7 but important modifiable risk factors in Aboriginal and Torres Strait Islander people 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 albumin excretion are independent risk factors for mortality.8 The bulk of this mortality is due to cardiovascular disease, and people with CKD are at higher risk of dying from coronary heart disease or stroke than they are of progressing to end stage kidney disease.9,10 Even mild reduction in GFR is associated with excess cardiovascular and stroke risk,11,12 while at any given level of kidney function, microalbuminuria or macroalbuminuria is associated with increased cardiovascular and stroke morbidity and mortality.13,14

Interventions

GFR testing

In clinical practice, GFR is often estimated [as eGFR] from serum creatinine and other parameters including gender and age using a formula such as the CKD-EPI.2 Care should be taken in accepting an eGFR value. Factors such as intercurrent illness, diet, underweight, overweight or obesity can bias the estimate. Furthermore, no formula has yet been validated for Aboriginal or Torres Strait Islander people.15
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.\(^{16}\) 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 study, only 8% of adults with proteinuria tested negative for albuminuria.\(^{16}\) The majority of international guidelines recommend screening for albuminuria rather than proteinuria for the detection of CKD.\(^{17}\) 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 hr) or macroalbuminuria (>300 mg/24 hr).\(^{17}\) A properly performed dipstick test, if negative, rules out macroalbuminuria but not microalbuminuria; a positive result required confirmation by laboratory methods.\(^{18}\) It is often convenient to measure albumin-creatinine ratio (ACR) or if indicated, protein-creatinine ratio (PCR), on a spot specimen preferably taken during first morning void. Table 13.2 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.\(^{17}\)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Normal albumin excretion</th>
<th>Microalbuminuria</th>
<th>Macroalbuminuria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary ACR</td>
<td>Male</td>
<td>&lt;2.5 mg/mmol</td>
<td>2.5–25 mg/mmol</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>&lt;3.5 mg/mmol</td>
<td>3.5–35 mg/mmol</td>
</tr>
<tr>
<td>Urinary albumin excretion per 24 hours</td>
<td>Either</td>
<td>&lt;30 mg/24 hr</td>
<td>30–300 mg/24 hr</td>
</tr>
</tbody>
</table>

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 measurement. Definition of abnormal albuminuria requires at least two elevated ACR measurements in a 3 month period, therefore a single abnormal test should be repeated.\(^{17}\)

Primary prevention

Evidence supports the efficacy and cost effectiveness of screening for CKD risk factors, and for albuminuria and reduced GFR, in Aboriginal and Torres Strait Islander people.\(^{19,20}\) The optimal age to start screening is, however, less clear. In a cohort of urban and rural Aboriginal children followed up for 4 years from 10 years of age, more than 70% potential markers of CKD (haematuria, albuminuria, systolic and diastolic hypertension) found at baseline did not persist on follow up.\(^{21}\) On the other hand, in a study of the prevalence of proteinuria, hypertension and diabetes in Aboriginal adults above the age of 25 years living in remote...
communities, the probability of an individual aged 25–34 years having at least one of these abnormalities was approximately three times higher than for a participant in the national AusDiab study; this differential increased further in older age groups. Based on this evidence, screening for CKD risk factors from age 18 years is recommended. If any risk factors are present then CKD screening for albuminuria and reduced eGFR is recommended.

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, 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. Programs that promote maternal health during pregnancy and prevent streptococcal infection in childhood may also reduce future risk of CKD.

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, reduce excess weight and take regular exercise. Limiting dietary sodium intake to 100 mmol (6 g salt) per day may reduce both blood pressure (BP) and albumin excretion.

An ACE inhibitor or ARB is generally the firstline treatment for lowering 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 may worsen kidney outcomes.

Statins reduce lipid concentrations and cardiovascular endpoints in patients with CKD, irrespective of stage, but no benefit on all cause mortality has been established. The reno-protective effects of statins are uncertain because of relatively sparse data and possible outcomes reporting bias.

Reasons for referral

The interventions tabulated in this chapter are concerned with preventing kidney disease, detecting and slowing the progression of established CKD, and reducing the associated risks of cardiovascular disease 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. The Caring for Australians with Renal Impairment guidelines recommend referral of patients with:

- Stage 4 or 5 CKD of any cause
- persisting albuminuria (ACR >30 mg/mmol)
- Declining eGFR >5 mL/min/1.73 m² in 6 months (average of at least three measurements)
- CKD and elevated BP that is not at target despite at least three BP lowering medications
- unexplained anaemia (<100 g/L) with eGFR <60 mL/min/1.73 m².
## Recommendations: Chronic kidney disease detection and management

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All adults aged 18–29 years without any CKD risk factors</td>
<td>Screen for CKD risk factors (overweight or obesity, diabetes, elevated BP and smoking, family history of kidney disease)</td>
<td>As part of an annual health assessment</td>
<td>IIIB</td>
<td>20</td>
</tr>
</tbody>
</table>
|                              | People aged 18–29 years with one of the following CKD risk factors:  
- family history of CKD or premature CVD  
- overweight/obesity  
- smoking  
- diabetes  
- elevated BP  
All people ≥30 years | Screen for CKD with eGFR and urinary albumin-creatinine ratio (ACR)  
A first void specimen is preferred  
If urine ACR is raised then repeat once or twice over 3 months. For further quantification consider collecting a timed specimen | Every 2 years (or more frequently if CVD risk is elevated – see Chapter 12: Cardiovascular disease prevention) | IIIC | 20 |
| **Behavioural**              | Adults with any risk factors for CKD (see above) | Offer individualised, structured education about risk factor avoidance and management | Annually | IIIB | 36 |
|                              | Offer smoking cessation support (see Chapter 1: Lifestyle, section on smoking)  
Advise avoidance of exposure to environmental tobacco smoke | Opportunistic | IIIB | 27,30,37 |
|                              | Encourage regular physical exercise appropriate to their physical ability and medical history (see Chapter 1: Lifestyle, section on physical activity) | Opportunistic | IIIB | 28,30 |
|                              | If overweight or obese encourage weight loss  
Offer group diet and exercise sessions if available, especially for patients with type 2 diabetes (see Chapter 1: Lifestyle, section on overweight/obesity) | Opportunistic | IB | 30,38 |
|                              | Advise to limit dietary sodium intake to 100 mmol/day (6 g salt per day) or less | Opportunistic | IIIB | 30 |
| Adults with CKD stages 1–3 (see Table 13.1) | Lifestyle risk factor management as above  
Patients with CKD should be advised not to use salt substitutes that contain high amounts of potassium salts | Opportunistic | As above for each risk factor | 27,28,30,37–39 |
## Recommendations: Chronic kidney disease detection and management (continued)

<table>
<thead>
<tr>
<th>Chemoprophylaxis</th>
<th>All people with CKD</th>
<th>Regularly review medications to identify and avoid those with potential nephrotoxicity</th>
<th>Opportunistic</th>
<th>GPP 40,41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults with CKD and albuminuria (see Table 13.2)</td>
<td>Commence treatment with an ACE inhibitor or ARB, regardless of BP level. The goal is &gt;50% reduction in albumin excretion without symptomatic hypotension</td>
<td>At diagnosis</td>
<td>IA 42–45</td>
<td></td>
</tr>
<tr>
<td>Adults with CKD and diabetes</td>
<td>Commence treatment with an ACE inhibitor or ARB regardless of BP level</td>
<td>At diagnosis</td>
<td>IA 37,45,46</td>
<td></td>
</tr>
<tr>
<td>Adults with CKD and elevated BP</td>
<td>Consider use of more than one drug to achieve adequate BP control. (The number of drugs required tends to increase with declining GFR)</td>
<td>Opportunistic</td>
<td>IA 37</td>
<td></td>
</tr>
<tr>
<td>Adults with CKD</td>
<td>Statins should be prescribed according to level of overall cardiovascular risk (see Chapter 12: Cardiovascular disease prevention)</td>
<td>At diagnosis</td>
<td>IB 43,44</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>Communities with high prevalence of scabies and pyoderma</td>
<td>Support the implementation of population based strategies for reduction of scabies and pyoderma among children (see Chapter 2: Child health and Chapter 5: Rheumatic heart disease)</td>
<td>N/A</td>
<td>IIIb 29,48</td>
</tr>
</tbody>
</table>
Resources
Chronic kidney disease management in general practice, 2nd edn (Kidney Health Australia)
Caring for Australians with Renal Impairment guidelines

References


Chapter 14

Type 2 diabetes prevention and early detection

Author Justin Coleman
Expert reviewers David Atkinson, Stephen Colagiuri
Overview

Type 2 diabetes is most commonly found in obese adults who develop increasing insulin resistance over months or years. For these patients there is a substantial ‘prediabetic’ 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. This chapter discusses type 2 diabetes in adults who are not pregnant.

The prevalence of type 2 diabetes in Aboriginal and Torres Strait Islander populations is 3–4 times higher at any age than the general population, with an earlier age of onset. The precise prevalence is hard to pinpoint; a 2011 systematic review of 24 studies showed prevalence estimates ranged from 3.5–31%, with most lying between 10% and 20%. Diabetes prevalence in remote populations is approximately twice that of urban populations and is higher among Aboriginal and Torres Strait Islander people.

Aboriginal and Torres Strait Islander men and women die from diabetes at 23 and 37 times the rate of non-Indigenous Australian men and women respectively, in the 35–54 years age group. Large scale 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.

Obesity is a very strong predictor for diabetes; a body mass index (BMI) ≥30 kg/m² increases the absolute risk of type 2 diabetes by 1.8–19-fold, depending on the population studied. A cohort study of non-diabetic Aboriginal adults aged 15–77 years in central Australia found that those with a BMI of ≥25 kg/m² had 3.3 times the risk of developing diabetes over 8 years of follow up compared to those with a BMI <25 kg/m². 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. Waist circumference performed slightly better than BMI at predicting diabetes in a remote Aboriginal community.
Interventions

Screening

Type 2 diabetes is generally underdiagnosed. Australia’s largest diabetes population study, which screened over 11,000 randomly selected people using an oral glucose tolerance test, found that, of the 7.4% who had diabetes, half (3.7%) had not been diagnosed previously, in an even spread across all age groups. A smaller study of Aboriginal and Torres Strait Islander people in Darwin found an overall diabetes prevalence of 17%, of which a 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.

Screening for undetected diabetes is an efficient method of preventing complications from this disease. Screening for diabetes will also detect pre-diabetes – impaired glucose tolerance (IGT) and/or impaired fasting glucose (IFG) – which cannot be detected clinically, but which is associated with an increased risk of developing diabetes and cardiovascular and other macrovascular disease.

Screening for diabetes in adults who are not pregnant should be done on an opportunistic basis, in the primary care setting, rather than in mass screening programs. Aboriginal and Torres Strait Islander people should be screened for diabetes from age 18 years, rather than from 40 years in the general Australian population. Although historically a fasting glucose was recommended as the sole initial test, the 2009 National Health and Medical Research Council (NHMRC) guideline recommends a three-step process: First, perform a formal assessment of risk factors, this then determines who requires a fasting glucose sample, and finally, those with equivocal glucose results require an oral glucose tolerance test (OGTT).

The recommended risk assessment tool is AUSDRISK, which contains information on age, gender, ethnicity, family history, hypertension, smoking, diet, physical activity and obesity. AUSDRISK has been validated in the general Australian population and is available as an interactive online page or a paper printout. Those whose AUSDRISK score is ≥12 proceed to a fasting plasma glucose test (FPG), or a random blood glucose test (RBG) if this is more practical.

The use of the AUSDRISK tool in assessing whether Aboriginal and Torres Strait Islander people should have blood glucose testing is controversial. The tool incorporates lower cutoff points for waist circumference measurements that are considered specific for Aboriginal and Torres Strait Islander people; this does not necessarily take into consideration the considerable heterogeneity of this population in Australia. Some clinics may decide the time spent on the tool adds an obstacle that results in fewer patients having any diabetes assessment at all. Other clinics may find the AUSDRISK screening questions a useful prompt for discussing diabetic risk factors.

In diagnosing diabetes, if FPG or RBG indicates diabetes, unless the patient has diabetic symptoms this should be confirmed by retesting on a separate day, because intra-individual variation occurs.

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 has the important advantage of being able to take further action on the same visit. An opportunistic random blood glucose sample 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.\(^1\)

Glycated haemoglobin (HbA1c), long used as a measure for assessing glycaemic control in people with diabetes, is not currently recommended for diagnosing diabetes in Australia, according to the NHMRC guidelines,\(^1\) although the 2010 USA guidelines for the first time included this indication, at a threshold of ≥6.5%.\(^13\) The recommendations may well soon change in Australia. The National Vascular Disease Prevention Alliance 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% being diagnostic’.\(^14\)

This recommendation has also been adopted by the World Health Organization as a diagnostic option.\(^15\) Currently, there is no Medicare rebate payable for measuring HbA1c in order to diagnose diabetes.

HbA1c results are affected by inter-laboratory variability (steadily improving), haemoglobin variants and alterations in red blood cell turnover (including pregnancy).\(^16\) Point-of-care capillary HbA1c testing has been shown to be an accurate alternative to laboratory testing in a remote Aboriginal community.\(^17\)

### Behavioural interventions

People with established type 2 diabetes can have their mortality halved by intensive treatment of multiple cardiovascular risk factors.\(^18\) 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 4 years compared to a control group (NNT=8), but maintained most of this benefit for at least 3 years after the initial intervention was ceased.\(^19\) There is strong evidence 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.\(^1\) However, the recent large ADDITION randomised trial showed that early, intensive risk factor management in newly diagnosed type 2 diabetics resulted in only a small reduction in the incidence of cardiovascular events and death.\(^18\) This outcome in European patients aged 40–69 years has uncertain applicability in the Aboriginal and Torres Strait Islander context.

Dietary intervention can effectively delay or prevent diabetes. Two high quality studies have randomised people without diabetes into individual dietary counselling versus routine treatment.\(^20\) The Da Qing IGT and Diabetes Study found that, after 6 years, the group given specific dietary advice had a 33% reduction in the incidence of diabetes compared to the control group. The Oslo Diet and Exercise Study found significant reductions in fasting blood glucose, insulin resistance and body mass index compared to the control group at 1 year.\(^20\) However, an 8-year follow up study in a remote Aboriginal community found that interventions targeting the community store and community nutritional education did not alter trends towards increasing prevalence of obesity and diabetes, possibly due to the limited healthy food choices available.\(^21\)

Dietary recommendations are found in the *Australian dietary guidelines* (see *Chapter 1: Lifestyle, section on overweight/obesity*).
Physical activity improves insulin sensitivity and promotes peripheral glucose uptake. 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 4 hours per week but did not lose weight still had a markedly decreased incidence of diabetes compared to those who were sedentary. A systematic review found good evidence of reduced diabetes for walking briskly for ≥2.5 hours per week. Ideally, a diabetes prevention strategy involves the combined interventions of diet modification and increased exercise. A systematic review of eight trials that combined these two interventions found the relative risk of diabetes was 0.63 compared to the control groups. A 7-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. Watching television is associated with diabetes; in Australia, those who watch TV 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.

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, preferably all, days (see Chapter 1: Lifestyle, section on physical activity).

Chemoprophylaxis and surgery

Current 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. Oral hypoglycaemic medication at the prediabetic stage can delay or prevent progression to diabetes, but is less effective than lifestyle changes. A large USA trial randomised subjects with prediabetes into an intensive lifestyle modification program, metformin or placebo. At 3 years, the metformin group had a 31% less progression to 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, so the trial was prematurely discontinued. 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%. Rosiglitazone and pioglitazone have consistently shown a potent beneficial effect in diabetes prevention but are associated with significant adverse effects, particularly new onset of congestive heart failure.

A Cochrane review showed that acarbose reduces the incidence of type 2 diabetes by 25% (NNT=10) in patients with IGT. A study randomising obese subjects 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 4 years. 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 2 years, the 1845 surgery cases had a 32-fold reduction in incidence of newly diagnosed diabetes. At 8 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.
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 people. Community stores are frequently the only food source outside traditional bush food. Various programs to influence the quality and cost of high nutritional foods in community stores have had some success; a retail co-operative in Arnhem land provided 100% freight-subsidised fruit and vegetables and doubled the intake of these foods per person at 3 years. However, the only study of a remote Aboriginal community store intervention that directly reported on diabetes prevalence did not show any improvement. More studies are needed.

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. Further studies are required to assess the association between sport uptake and diabetes in Aboriginal and Torres Strait Islander communities.
### Recommendations: Type 2 diabetes prevention and early detection

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>Adults ≥18 years from regions with a high prevalence of diabetes (≥5%) AND/OR Adults with any of the following high risk conditions:  - previous IGT or IFG  - history of gestational diabetes mellitus  - history of polycystic ovary syndrome  - history of cardiovascular disease  - current antipsychotic medication use</td>
<td>Measure fasting plasma glucose or random venous blood glucose  A laboratory test is preferable, but finger prick testing is an alternative. HbA1c may also be used as a screening test for the diagnosis of diabetes*  Perform oral glucose tolerance test in those with equivocal results as above  The 2006 WHO/International Diabetes Federation criteria should be used to diagnose type 2 diabetes, IGT and IFG (see Table 14.1)</td>
<td>Annually as part of an adult health assessment</td>
<td>IIB 1</td>
<td>1</td>
</tr>
<tr>
<td><strong>All adults ≥18 years from regions with a low population prevalence for diabetes (&lt;5%)</strong></td>
<td>Consider screening using AUSDRISK tool to determine if blood testing is required (see Resource)  If AUSDRISK score is ≥12 then proceed as above for high risk populations</td>
<td></td>
<td>Annually as part of an adult health assessment</td>
<td>IIB 1</td>
<td>1</td>
</tr>
<tr>
<td><strong>People &lt;18 years with overweight/obesity</strong></td>
<td>Consider the potential for early onset type 2 diabetes and consider testing according to clinical context (see Chapter 1: Lifestyle, section on overweight/obesity)</td>
<td></td>
<td>Opportunistic</td>
<td>GPP 34</td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All people</td>
<td>Measure BMI and waist circumference  Advise minimum of 30 minutes moderate activity on most days  Encourage diet rich in vegetables, fruits, legumes, high fibre cereals, fish, and lean meats. Limit fats, salt, sugar, alcohol  For people overweight or obese (see recommendations in Chapter 1: Lifestyle, section on overweight/obesity)</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IA 1,8</td>
<td></td>
</tr>
</tbody>
</table>
**Recommendations: Type 2 diabetes prevention and early detection (continued)**

<table>
<thead>
<tr>
<th>People with BMI ≥35 kg/m²</th>
<th>Advise intensive lifestyle modification as above</th>
<th>Discuss risks and benefits of bariatric surgery and consider referral if services are available (see Chapter 1: Lifestyle, section on overweight/obesity)</th>
<th>Opportunistic</th>
<th>IIIC</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemoprophylaxis</td>
<td>People with a high risk condition (see above) or at high risk of diabetes based on an AUSDRISK score ≥15</td>
<td>Advise intensive lifestyle modification as above</td>
<td>If lifestyle modification is unable to be achieved, the use of metformin, acarbose, rosiglitazone or orlistat has been shown to delay or prevent the onset of diabetes</td>
<td>Opportunistic</td>
<td>1B</td>
</tr>
<tr>
<td>Environmental</td>
<td>Communities</td>
<td>Advocate for multifactorial and coordinated community based interventions to increase access to healthy and nutritious food and promotion of increased physical activity (see Chapter 1: Lifestyle, section on physical activity)</td>
<td>N/A</td>
<td>GPP</td>
<td>35–38</td>
</tr>
</tbody>
</table>

* HbA1c testing for the purpose of diagnosing diabetes cannot currently be claimed from Medicare

---

### Table 14.1. Diagnostic criteria for type 2 diabetes and intermediate hyperglycaemia

<table>
<thead>
<tr>
<th>Type 2 diabetes</th>
<th>Fasting plasma glucose*</th>
<th>≥7.0 mmol/L or</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Random venous glucose (point of care)*</td>
<td>≥11.1 mmol/L or</td>
</tr>
<tr>
<td></td>
<td>2-hr plasma glucose†</td>
<td>≥11.1 mmol/L or</td>
</tr>
<tr>
<td></td>
<td>Glycated haemoglobin (HbA1c)‡</td>
<td>≥6.5%</td>
</tr>
<tr>
<td><strong>Impaired glucose tolerance (IGT)</strong></td>
<td>Fasting plasma glucose</td>
<td>&lt;7.0 mmol/L and</td>
</tr>
<tr>
<td></td>
<td>2-hr plasma glucose†</td>
<td>≥7.8 and &lt;11.1 mmol/L</td>
</tr>
<tr>
<td><strong>Impaired fasting glucose (IFG)</strong></td>
<td>Fasting plasma glucose</td>
<td>6.1–6.9 mmol/L and if measured</td>
</tr>
<tr>
<td></td>
<td>2-hr plasma glucose†</td>
<td>&lt;7.8 mmol/L</td>
</tr>
<tr>
<td><strong>Non-diabetes</strong></td>
<td>Fasting plasma glucose</td>
<td>≤6.0 mmol/L or</td>
</tr>
<tr>
<td></td>
<td>Random venous glucose (point-of-care)</td>
<td>≤6.0 mmol/L</td>
</tr>
</tbody>
</table>

* The diagnosis of type 2 diabetes requires two positive blood tests on separate days unless the plasma glucose is unequivocally elevated in the presence of acute metabolic decompensation or obvious symptoms such as excessive thirst and polyuria
† Venous plasma glucose 2-hr after ingestion of 75 g oral glucose load. If 2-hr plasma glucose is not measured, status is uncertain as type 2 diabetes or IGT cannot be excluded
‡ Currently recommended in some, but not all guidelines. HbA1c is not funded by Medicare for the initial diagnosis of diabetes

Source: Colagiuri S, Davies D, Girgis S, Colagiuri R 2009
Resource
AUSDRISK tool:
www.ausrisk.com.au

References


Chapter 15
Prevention and early detection of cancer

Author Nadia Lusis
Expert reviewers Bruce Armstrong (prostate and bowel), Vijenti Chandra (breast and cervical), Greg Dore (liver)
Overview

Cancer is estimated to account for 6% of the health gap between Aboriginal and Torres Strait Islander people and the total population. Aboriginal men have a 1.7 times higher burden of disease and Aboriginal women a 1.9 times higher burden of disease due to cancer when compared to the total Australian male and female population respectively.¹

Inadequate identification of Indigenous 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. Available statistics on cancer in Aboriginal and Torres Strait Islander people show that while overall cancer incidence may be lower, Aboriginal and Torres Strait Islander people 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 people have higher case fatality rates for many cancers compared to the rest of the population.²
Prevention of cervical cancer

Background
The incidence of cervical cancer in Aboriginal and Torres Strait Islander women is about 2.4–3 times greater than in non-Indigenous women. Cervical cancer is the third most common cause of death due to cancer in Aboriginal and Torres Strait Islander women, with the years of life lost due to cervical cancer being 5.7 times greater and the mortality rate being 5.6 times higher in Aboriginal and Torres Strait Islander women compared to non-Indigenous women. One study suggested that Aboriginal women in remote areas appeared to be at higher risk of cervical cancer than those in urban areas.

Interventions

Vaccination against human papillomavirus (HPV) is recommended due to the link between cervical HPV infection and the development of cervical dysplasia. As the efficacy of vaccination in preventing HPV infection and cervical dysplasia decreases with the increasing number of previous sexual partners, vaccination should preferably be given prior to onset of sexual activity, or otherwise as early as possible. Studies in the 14–26 years age group have provided evidence for immunogenicity and prevention of high grade squamous cervical lesions, while studies in other age groups at this stage provide evidence for immunogenicity only. See the Australian Immunisation Handbook for more details.

Pap tests have been shown to reduce the risk of developing cervical cancer. In 2008–09 in Australia, 61.2% of the target population participated in screening, with the lowest participation rates in the lowest (53.3%) compared to the highest (64.3%) socioeconomic quintile. Cervical screening state registries do not systematically collect information on the Aboriginal and Torres Strait Islander status of women screened. Aboriginal and Torres Strait Islander women tend to have lower participation rates in screening programs, with studies using indirect methods to calculate their participation rates are 30–50% lower than for non-Indigenous women.

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 and Torres Strait Islander health workers, community participation and linkages between services. The Practice Incentives Program (PIP) provides financial incentives for accredited health services to provide Pap screening.

Pap testing recommendations apply to asymptomatic women. Women with symptoms, abnormalities of the cervix on examination or glandular abnormalities on smears should be referred for specialist review and treatment.

A review of the National Cervical Screening Program is planned, and once this is complete the National Health and Medical Research Council (NHMRC) guidelines are likely to be reviewed, which may result in changes to these recommendations. The National Cervical Screening Program recommends Pap tests be used as the primary method for population screening until there is sufficient evidence indicating the effectiveness of newer cervical screening technologies such as Thinprep and HPV tests. Women vaccinated against HPV should follow the same cervical screening recommendations as unvaccinated women.
## Recommendations: Cervical cancer prevention and detection

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immunisation</strong></td>
<td>Girls aged 10–13 years</td>
<td>Promote human papilloma virus (HPV) vaccination for the prevention of cervical cancer ideally prior to the onset of sexual activity</td>
<td>As per National Immunisation Program Schedule (NIPS) (varies between states and territories)</td>
<td>IIB</td>
<td>10,21</td>
</tr>
<tr>
<td></td>
<td>Girls aged 14–18 years</td>
<td>Promote HPV vaccination for the prevention of cervical cancer ideally prior to the onset of sexual activity*</td>
<td>As per Australian Immunisation Handbook</td>
<td>IIB</td>
<td>10,21</td>
</tr>
<tr>
<td></td>
<td>Women aged 19–26 years</td>
<td>Promote HPV vaccination for the prevention of cervical cancer for health benefit, but likely to be less effective*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Women aged 27–45 years</td>
<td>HPV vaccination may be of some benefit depending on sexual history†</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Screening</strong></td>
<td>Women aged 18–69 years who have ever been sexually active</td>
<td>Offer Pap test screening from 18–20 years or 1–2 years after first sexual intercourse (whichever is later) regardless of whether HPV vaccination has been given</td>
<td>Every 2 years</td>
<td>IIA</td>
<td>22,23</td>
</tr>
<tr>
<td></td>
<td>Women aged 70+ years who have ever been sexually active</td>
<td>Offer Pap test screening to women who have never had a Pap test or who request a Pap test</td>
<td>Pap test screening may cease for women aged 70 years who have had two normal Pap smears within the past 5 years</td>
<td>IIA</td>
<td>22,23</td>
</tr>
<tr>
<td></td>
<td>Women at higher risk (eg. previous cervical abnormalities, immune suppression, in utero exposure to diethylstilboestrol)</td>
<td>Offer Pap test screening</td>
<td>Management regimen is complex: see NHMRC guidelines</td>
<td>GPP</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Women who have been previously treated for high grade squamous intraepithelial lesion</td>
<td>Offer annual Pap test screening combined with cervical HPV testing for 2 or more consecutive years, if not already done following specialist treatment</td>
<td>If both tests are negative in 2 consecutive years, screening for average risk population can recommence</td>
<td>III-C</td>
<td>18,24</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All women</td>
<td>Assess smoking status and advise on increased risks of cervical dysplasia and cervical cancer (see Chapter 1: Lifestyle, section on smoking)</td>
<td>As part of an annual health assessment</td>
<td>IIB</td>
<td>25,26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Offer a sexual health review (see Chapter 8: Sexual health and bloodborne viruses)</td>
<td>As part of an annual health assessment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Currently not subsidised through the NIPS
† 4-valent HPV vaccine (Gardasil®) is not registered by the Therapeutic Goods Administration for use in this age group due to lack of safety and efficacy data at the time of writing this guideline
Resources

Screening to prevent cervical cancer: guidelines for the management of asymptomatic women with screen detected abnormalities (NHMRC)

The Australian Immunisation Handbook (NHMRC): HPV chapter
Prevention and early detection of liver (hepatocellular) cancer

Background

Limited data are available on the incidence and mortality from liver cancer in Aboriginal and Torres Strait Islander people, and different jurisdictions report different results. Northern Territory data showed the age standardised incidence rates were 6.6 times higher in Aboriginal men and 4.5 in Aboriginal women, and the mortality rate ratio was 8.7 for men and 7.0 for women. However, in Queensland, based on cancer registry data, no difference was shown in liver cancer incidence or mortality between Aboriginal and non-Aboriginal people.

Hepatocellular carcinoma (HCC) 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. Notification rates for hepatitis B and C are higher for Aboriginal and Torres Strait Islander people. The prevalence of hepatitis B infection in Aboriginal and Torres Strait Islander populations has been estimated to be 2% in the urban areas and 8% in rural areas, compared to less than 1% for the total Australian population. Despite 2.5% of the Australian population identifying as Aboriginal or Torres Strait Islander, Aboriginal and Torres Strait Islander people are estimated to account for 16% of the population with chronic hepatitis B infection.

Low rates of identification of Indigenous status on infectious disease notifications makes data difficult to interpret. It is estimated that 4% of Aboriginal and Torres Strait Islander people have chronic hepatitis C compared to 1% of non-Indigenous people, however, data quality is poor, with identification of Aboriginal and Torres Strait Islander status for those newly diagnosed with hepatitis C in 2009 occurring in only 39% of reports.

Some people are at higher risk of being infected with hepatitis B or C (Table 15.1).

<table>
<thead>
<tr>
<th>Table 15.1. Risk factors for hepatitis B and C infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Those at higher risk of hepatitis B infection include non-immune household or sexual contacts of people with acute or chronic hepatitis B; people aged 15–30 years; babies born to mothers with hepatitis B infection; people with multiple sexual partners; men who have sex with men; people who inject drugs; people at occupational risk or in prison/detention; and people with chronic liver disease, hepatitis C infection, HIV or impaired immunity</td>
</tr>
<tr>
<td>Those at higher risk of hepatitis C infection include people who have ever injected drugs for recreational purposes; people who have ever been incarcerated; those with tattoos and body piercings; recipients of blood products, tissues or organs prior to February 1990 in Australia or anytime overseas; and sexual partners of those with hepatitis C infection if blood has been associated with sexual activity</td>
</tr>
</tbody>
</table>

See also Chapter 8: Table 8.1: Risk factors for sexually transmissible infections and bloodborne viruses

Sources: National Health and Medical Research Council 2008 and Department of Health and Ageing 2010.
**Interventions**

Hepatitis B vaccination reduces the risk of chronic hepatitis B 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 hepatitis B vaccination due to intermediate to high endemicity of hepatitis B infection.\(^{30}\) The US Centres for Disease Control recommends screening and hepatitis B vaccination for all people from geographic areas with a prevalence of hepatitis B of >2%.\(^{31}\) Universal infant vaccination and catch-up adolescent vaccination is currently available through the National Immunisation Program. 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. Licensed therapies provided through the S100 scheme include tenofovir, entecavir and pegylated interferon.

Hepatitis C antiviral therapy for those with chronic hepatitis C reduces liver disease progression and risk of HCC. Licensed therapy provided through the S100 scheme is pegylated interferon and ribavirin.

### Recommendations: Liver cancer prevention and detection

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Immunisation</strong></td>
<td>All people</td>
<td>Review if hepatitis B vaccination is indicated (see recommendations in Chapter 8: Sexual health and bloodborne viruses and Chapter 2: Child health)</td>
<td>See Chapter 8</td>
<td>See Chapter 8</td>
<td>32</td>
</tr>
<tr>
<td><strong>Screening</strong></td>
<td>All people</td>
<td>Review if hepatitis B and C screening is indicated (see recommendations in Chapter 8: Sexual health and bloodborne viruses)</td>
<td>See Chapter 8</td>
<td>See Chapter 8</td>
<td>32,33</td>
</tr>
<tr>
<td>People with chronic liver disease or chronic hepatitis infection</td>
<td>Recommend specialist review to consider if screening for hepatocellular carcinoma using alpha fetoprotein (AFP) and ultrasound is warranted</td>
<td>6–12 monthly as part of specialist management plan</td>
<td>IIIC</td>
<td>34–37</td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>Adolescents and adults</td>
<td>Assess levels of alcohol consumption and advise about safer levels of alcohol consumption to reduce long terms risk of alcohol related harm (see Chapter 1: Lifestyle, section on alcohol and Chapter 3: The health of young people)</td>
<td>As part of an annual health assessment</td>
<td>IIIB</td>
<td>38</td>
</tr>
<tr>
<td>People with overweight/obesity</td>
<td>Advise of the risks of liver disease and promote weight reduction strategies (see Chapter 1: Lifestyle, section on overweight/obesity)</td>
<td>Opportunistic</td>
<td>GPP</td>
<td>39</td>
<td></td>
</tr>
</tbody>
</table>
### Recommendations: Liver cancer prevention and detection (continued)

<table>
<thead>
<tr>
<th>People at higher risk of hepatitis B or C infection (see Table 15.1)</th>
<th>Provide counselling on harm minimisation and promote peer education strategies around safer sex and injecting drug use where relevant (see Chapter 8: Sexual health and bloodborne viruses)</th>
<th>Opportunistic and as part of an annual health assessment</th>
<th>GPP</th>
<th>29</th>
</tr>
</thead>
<tbody>
<tr>
<td>People with chronic liver disease or chronic hepatitis infection</td>
<td>Provide counselling regarding risks of alcohol consumption</td>
<td>6–12 monthly as required</td>
<td>GPP</td>
<td>36</td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>People with chronic hepatitis B† or hepatitis C infection</td>
<td>Assess disease severity and suitability for antiviral treatment</td>
<td>Regular monitoring for disease progression is recommended</td>
<td>Refer to national or local guidelines for management recommendations (see Resources)</td>
</tr>
</tbody>
</table>

* The World Health Organization recommends screening and hepatitis B vaccination for all people from geographic areas with a prevalence of hepatitis B of >2%.30,31 The prevalence of hepatitis B infection in the Aboriginal population has been estimated to be 2% in the urban areas and 8% in rural areas.2

† Hepatitis B surface antigen positive >6 months

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**Resources**

- The Australian immunisation handbook (NHMRC): hepatitis B chapter
- Australia and New Zealand chronic hepatitis B recommendations (Gastroenterological Society of Australia and Digestive Health Foundation)
- HIV, viral hepatitis and STIs: a guide for primary care (Australasian Society for HIV Medicine: further resources will be available through ASHM in 2012, including information on access to new treatment options for some people with chronic hepatitis C infection)
Prevention and early detection of breast cancer

Background
Breast cancer is the most common cancer diagnosed in Aboriginal and Torres Strait Islander women, despite an under-reporting rate of at least 10%.41 Despite the age standardised incidence of breast cancer being estimated at around 30% lower for Aboriginal compared to non-Aboriginal women,3,4 it is estimated that there is a similar burden of disease, that the years of life lost may be 1.5 times higher and mortality rates may be up to 1.5 times greater for Aboriginal women.1,4,41

Aboriginal and Torres Strait Islander women have lower participation rates in mammographic screening programs. The estimated participation of Aboriginal and Torres Strait Islander women in the BreastScreen program for the target age range of 50–69 years, using self identification, has remained constant from 2002–03 to 2007–08 at 36%, while participation of non-Indigenous women rose from 50.0% to 54.8% over the same timeframe.42

Estimating risk based on family history
Estimations of the risk of breast cancer based on family history are available (see Resources). Table 15.2 highlights risk categories based on the National Breast and Ovarian Cancer Centre recommendations.43 The risk calculation may differ from the more up-to-date online resource but is provided for situations where the online resource may not be available.44

<table>
<thead>
<tr>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>At or slightly above average risk (no more than 1.5 times the population average risk)</td>
<td>Moderately increased risk (1.5–3 times the population average risk)</td>
<td>Potentially high risk (may be more than 3 times the population average risk)</td>
</tr>
<tr>
<td>No confirmed family history of breast cancer</td>
<td>One first degree relative diagnosed with breast cancer at age 50 years or older</td>
<td>Two first degree or second degree relatives diagnosed with breast cancer before the age of 50 years (without the additional features of the potentially high risk group – see category 3)</td>
</tr>
<tr>
<td>One second degree relative diagnosed with breast cancer at any age</td>
<td>Two first degree relatives, on the same side of the family, diagnosed with breast cancer (without the additional features of the potentially high risk group – see category 3)</td>
<td>Two first degree or second degree 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:</td>
</tr>
<tr>
<td>Two second degree relatives on the same side of the family diagnosed with breast cancer at age 50 years or older</td>
<td>Two second degree relatives, on the same side of the family, diagnosed with breast cancer, at least one before the age of 50 years, (without the additional features of the potentially high risk group – see category 3)</td>
<td>• additional relative(s) with breast or ovarian cancer</td>
</tr>
<tr>
<td>Two first degree or second degree relatives diagnosed with breast cancer, at age 50 years or older, but on different sides of the family (ie. one on each side of the family)</td>
<td></td>
<td>• breast cancer diagnosed before the age of 40 years</td>
</tr>
</tbody>
</table>

Source: National Breast and Ovarian Cancer Centre 201043

Table 15.2. Risk categories for breast cancer based on family history

Member of a family in which the presence of a high risk breast cancer or ovarian cancer gene mutation has been established
Interventions

Mammographic screening for women at average or slightly above average risk is currently recommended at 50–69 years, and is available but not recommended as routine for women in this risk group aged 40–49 years. For both of these age groups, mammographic screening has been shown to reduce breast cancer mortality.

There are some concerns about an increased risk of overdiagnosis and overtreatment of breast cancers that may never become clinically significant and the psychological effects of increased investigation for false positive results; this warrants more definitive research to quantify the magnitude of these effects. It should be noted that the risk of breast cancer increases from age 40–69 years, and thus there may possibly be more benefit for older women in each age group. Women should be provided with information to allow an informed decision based on their individual risk and preferences. Routine mammographic screening is not recommended for women younger than 40 years. Routine mammographic screening is not recommended for women aged 70 years or older. The risk of breast cancer increases with age, but decisions about mammographic screening need to take into account general health and other patient factors to decide on potential benefits of screening.45–50

Participation in mammographic screening may be improved by organised patient reminder and recall systems.51 Strategies to increase participation of Aboriginal and Torres Strait Islander women need to be tailored to suit the 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.15–18

Magnetic resonance imaging (MRI) screening combined with mammography has been shown to be more sensitive than mammography alone in women younger than 50 years at high risk of breast cancer. This option may be considered as part of specialist review. A Medicare rebate is available when referred by a specialist.52

Population screening by regular clinical breast examination cannot be recommended due to lack of evidence that it reduces mortality from breast cancer.48,50,53

Regular breast self examination cannot be recommended due to lack of evidence that it reduces mortality from breast cancer.50,53–55

Hormone replacement therapy (HRT), ie. combined (oestrogen-progesterone) at or around the time of menopause increases the risk of breast cancer. The risk increases with duration of use, especially after 5 years. Women should be informed of the risks and benefits of HRT use to allow an informed decision to be made. For women who have had a hysterectomy, oestrogen-only HRT may be a better choice.56 Current evidence suggests that use of combined HRT does not have an additive effect when combined with a family history risk of breast cancer.57

Chemoprophylaxis (ie. tamoxifen and raloxifene) have shown some benefit in preventing breast cancers, though with a risk of adverse effects. At December 2010, neither had Pharmaceutical Benefits Scheme approval for primary prevention of breast cancer in Australia. Trials of aromatase inhibitors are also being conducted.54,58–60
<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All women</td>
<td>Ask about family history of breast cancer to ascertain the individual risk of developing breast cancer (see Table 15.2)</td>
<td>As part of an annual health assessment</td>
<td>GPP</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discuss ‘breast awareness’ rather than promoting regular breast self examination (ie. ‘get to know what your breasts normally look and feel like’) and ask women to promptly report persistent or unusual changes</td>
<td>IIC</td>
<td>50,53–55</td>
<td></td>
</tr>
<tr>
<td>Women aged 40–49 years at or slightly above average risk (see Table 15.2)</td>
<td>Routine mammographic screening is not recommended. If requested, provide information about mammographic screening to allow an informed decision based on individual risk and preferences</td>
<td>N/A</td>
<td>IB</td>
<td>46,49,50,61</td>
<td></td>
</tr>
<tr>
<td>Women aged 40–49 years at moderately increased risk (see Table 15.2)</td>
<td>Consider annual mammography starting at age 40 years. Consider referral to family cancer clinic or specialist cancer clinic where available for initial assessment of risk of developing cancer. This includes advice on the role of genetic testing, strategies to reduce risk of cancer, and information about early detection (see Resources)</td>
<td>Annually</td>
<td>GPP</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Women aged 50–69 years at or slightly above average risk (see Table 15.2)</td>
<td>Recommend mammography screening and provide information to allow an informed decision based on individual risk and preferences</td>
<td>Every 2 years</td>
<td>IB</td>
<td>45–50,62</td>
<td></td>
</tr>
<tr>
<td>Women aged 50–69 years at moderately increased risk (see Table 15.2)</td>
<td>Recommend routine mammography screening. Consider referral to family cancer clinic* or specialist cancer clinic for initial assessment</td>
<td>Every 2 years</td>
<td>GPP</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Women at potentially high risk of breast cancer (see Table 15.2)</td>
<td>Recommend mammographic screening regardless of age</td>
<td>Consider annually</td>
<td>GPP</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Offer referral to a family cancer clinic* for risk assessment, possible genetic testing and development of a management plan</td>
<td>When calculated to be at potentially high risk, and as needed</td>
<td>GPP</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consider MRI breast screening in addition to mammography if aged &lt;50 years. (Specialist referral is required to claim a Medicare rebate)</td>
<td>Consider annual screening depending on specialist advice</td>
<td>IIIB</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consider clinical breast examination</td>
<td>As part of a well women’s check</td>
<td>GPP</td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>
### Recommendations: Breast cancer prevention and detection (continued)

<table>
<thead>
<tr>
<th>Category</th>
<th>Target Group</th>
<th>Recommendation</th>
<th>Evidence Level</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavioural</strong></td>
<td>All women</td>
<td>Promote physical activity as physical inactivity increases the risk of breast cancer (see Chapter 1: Lifestyle, section on physical activity)</td>
<td>III-B</td>
<td>1, 63, 64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advise that alcohol consumption increases the risk of breast cancer, and that if alcohol is consumed it should be done at safe levels (see Chapter 1: Lifestyle, section on alcohol)</td>
<td>IIIB</td>
<td>38, 64–66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advise that cigarette smoking increases the risk of breast cancer, and support people who smoke to quit (see Chapter 1: Lifestyle, section on smoking)</td>
<td>IIIC</td>
<td>67, 68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advise that maintaining a healthy weight lowers the risk of breast cancer (see Chapter 1: Lifestyle, section on overweight/obesity)</td>
<td>IIIB</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Pregnant and breastfeeding women</td>
<td>Advise that breastfeeding has been shown to reduce the risk of breast cancer, and support women to breastfeed their infants (see Chapter 2: Child health, section on anaemia)</td>
<td>IIIB</td>
<td>64, 69</td>
</tr>
<tr>
<td></td>
<td>Women on combined hormone replacement therapy (HRT)</td>
<td>Advise about risks and benefits of combined HRT, in particular advise about increased risk of breast cancer with continuous use for more than 5 years</td>
<td>I-IIIA</td>
<td>56, 70, 71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When considering commencing HRT and every 6 months for women on combined HRT</td>
<td>IIIB</td>
<td>64</td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>Women at potentially high risk, and women aged &gt;35 years at moderate risk</td>
<td>Consider specialist referral to discuss preventive treatment with tamoxifen or raloxifene Use is not currently approved for subsidy under the Pharmaceutical Benefits Scheme for the primary prevention of breast cancer (See Resources)</td>
<td>IIID</td>
<td>54, 58–60</td>
</tr>
</tbody>
</table>

* Family cancer clinics provide counselling and information for families with a history of cancer on inheriting cancer, individual risk, screening, cancer risk reduction strategies, and genetic testing where appropriate. Clinics are conducted through the public hospital system and there is no direct cost to the patient for consultation or genetic testing. Location of family cancer clinics in Australia can be found at www.cancer.org.au/File/Aboutcancer/Family_Cancer_Clinics_31OCT06.pdf
Resources
Family cancer clinics (Cancer Australia)

Online calculator, familial risk assessment – breast and ovarian cancer (National Breast and Ovarian Cancer Centre)

Advice about familial aspects of breast cancer and epithelial ovarian cancer (National Breast and Ovarian Cancer Centre)

Advice for women seeking advice about risk reducing medication (Cancer Australia)
Prevention and early detection of colorectal (bowel) cancer

Background
Colorectal cancer is the third most common cancer diagnosed in both Aboriginal men and women. The aged standardised incidence of colorectal cancer from available data showed a 41% lower relative risk in Aboriginal and Torres Strait Islander people compared to non-Indigenous people. Despite the lower incidence of bowel cancer, due to later stage at diagnosis, the burden of disease (measured in disability adjusted life years [DALYs]) for colorectal cancer in Aboriginal people was 1.1 times higher than that of the total Australian population. 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 that for Aboriginal and Torres Strait Islander people.

The lower participation of Aboriginal and Torres Strait Islander people 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 underidentification of Aboriginal or Torres Strait Islander origin when returning forms. Culturally appropriate population 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.

Estimating risk based on family history
The 2005 National Health and Medical Research Council endorsed Guidelines for the prevention, early detection and management of colorectal cancer are used to determine an asymptomatic person’s risk of colorectal cancer based on family history. Table 15.3 highlights the risk factors for each risk category. Also see Resources.
### Table 15.3. Risk categories for colorectal cancer based on family history

<table>
<thead>
<tr>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Those at or slightly above average risk based on family history</td>
<td>Those at moderately increased risk based on family history</td>
<td>Those at potentially high risk based on family history</td>
</tr>
<tr>
<td>No personal history of colorectal cancer, colorectal adenomas or chronic inflammatory bowel disease and no confirmed close family history of colorectal cancer OR One first degree (parent, sibling, child) or second degree (aunt, uncle, niece, nephew, grandparent, grandchild) relative with colorectal cancer diagnosed at age 55 years or older OR Two relatives diagnosed with colorectal cancer at age 55 or older but on different sides of the family</td>
<td>One first degree relative with colorectal cancer diagnosed before the age of 55 years (without potentially high risk features as in category 3) OR Two first or one first and one second degree relative/s on the same side of the family with colorectal cancer diagnosed at any age (without potentially high risk features as in category 3)</td>
<td>Three or more first degree relatives or a combination of first and second degree relatives on the same side of the family diagnosed with colorectal cancer OR Two or more first or second degree relatives on the same side of the family diagnosed with colorectal cancer plus any of the following high risk features:</td>
</tr>
<tr>
<td>- multiple colorectal cancers in a family member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- colorectal cancer before the age of 50 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- a hereditary non-polyposis colorectal cancer (HNPCC) related cancer (endometrial, ovarian, stomach, small bowel, renal pelvis or ureter, biliary tract, brain cancer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- at least one first degree or second degree relative with a large number of adenomas throughout the large bowel (suspected familial adenomatous polyposis (FAP)) OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- member of a family in which a gene mutation that confers a high risk of colorectal cancer has been identified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Interventions

The evidence for faecal occult blood testing (FOBT) screening is that it is most appropriate for those aged 50–75 years. Screening could be considered for those aged 76–85 years depending on patient circumstances. Evidence is lacking for benefit of screening for those aged >85 years.\(^{76–79}\) A limited National Bowel Cancer Screening Program concluded in 2010, and plans for further government funding remain uncertain. FOBT kits (for a fee) may be obtained through The Cancer Council and some GPs and pharmacies.\(^{80,81}\) Sigmoidoscopy (preferably flexible) every 5 years from the age of 50 years\(^{76}\) or colonoscopy every 10 years\(^{79}\) may be alternatives to second yearly FOBT. GPs can also refer patients for examination of faecal specimens for occult blood under Medicare Benefits Schedule (Items 66764, 66767 and 66770).

There is ongoing debate about the benefits of using aspirin for prevention of adenomas and colorectal cancers.\(^{76,82–87}\) For people with previous adenomas who are at higher risk of colorectal cancer, benefits of reduction in recurrent adenoma and colorectal cancer may outweigh the risks of harm.\(^{76,84,88}\)
## Recommendations: Colorectal cancer prevention and detection

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>All people</td>
<td>Ask about family history of colorectal cancer (see Table 15.3) in order to estimate the individual risk of developing colorectal cancer</td>
<td>As part of an annual health assessment</td>
<td>GPP 76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>People at or slightly above average risk age 50+ years (category 1: Table 15.3)</td>
<td>Consider faecal occult blood test (FOBT)* and refer all abnormal results for appropriate diagnostic evaluation</td>
<td>Every 2 years from age 50–75 years, and could be continued beyond 75 years depending on individual circumstances*</td>
<td>IA 76–79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>People at moderate risk (category 2: Table 15.3)</td>
<td>Consider referral for colonoscopy (Flexible sigmoidoscopy and double contrast barium enema or CT colonography may be offered if colonoscopy is contraindicated)</td>
<td>Every 5 years starting at age 50 years, or at an age 10 years younger than the age of first diagnosis of bowel cancer in the family, whichever comes first</td>
<td>IIIC 76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Those at potentially high risk (category 3: Table 15.3)</td>
<td>Consider referral to a specialist service for further risk assessment and possible genetic testing, and to a bowel cancer specialist to plan appropriate surveillance (See Resources for specific recommendations for screening for those with FAP or HNPCC)**</td>
<td>At the time of determining the individual is at high risk Offer referral later if not done at initial assessment</td>
<td>IIIC IIIC</td>
<td></td>
</tr>
<tr>
<td>Past history of adenoma</td>
<td>Undertake surveillance colonoscopy</td>
<td>Timeframe for surveillance colonoscopy varies (see Resources)</td>
<td>IA 76</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td>All people</td>
<td>Provide lifestyle risk factor counselling on the benefits of regular physical activity, maintaining healthy weight, alcohol intake in the low risk range, avoidance of tobacco smoking, restricting energy intake and dietary fat (see Chapter 1: Lifestyle) Also recommend consuming only moderate amounts of red meat, minimising consumption of charred and processed meats, and consuming vegetables and dietary fibre as these foods may be protective</td>
<td>As part of an annual health assessment</td>
<td>IIIC 1,38,65,66,76</td>
<td></td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>Following complete removal of adenoma at colonoscopy</td>
<td>Consider prophylactic aspirin use (in consultation with a specialist)</td>
<td>At time of diagnosis with colorectal adenoma</td>
<td>IIC 76,84,88</td>
<td></td>
</tr>
</tbody>
</table>

* Free, one-off FOBTs are offered to people turning 50, 55 or 65 years between January 2011 and December 2014. GPs can also refer patients for examination of faecal specimens for occult blood under Medicare Benefits Schedule (items 66764, 66767 and 66770)
** Familial adenomatous polyosis (FAP); hereditary non-polyosis colorectal cancer (HNPCC)
Resources
Guidelines for the prevention, early detection and management of colorectal cancer used to determine a person’s risk of colorectal cancer based on family history

Familial aspects of bowel cancer: a guide for health professionals
**Early detection of prostate cancer**

**Background**
After lung cancer, prostate cancer is the second most common cancer diagnosed in Aboriginal men. The age standardised incidence of prostate cancer in Aboriginal men was estimated to be 55% less than for non-Aboriginal men, with a corresponding mortality rate that was 26% lower. Missing data on Indigenous status was estimated to be 18%.

Factors that may increase the relative risk of prostate cancer are:
- two or more relatives affected
- lower age at diagnosis of relative(s)
- one first degree relative with prostate cancer (brother higher risk than father)
- one second degree relative with prostate cancer (smaller increase in risk than first degree relative).

Being a carrier of BRAC1 or BRCA2 mutations also increases risk.

**Screening for prostate cancer**
Neither the blood prostate specific antigen (PSA) test nor digital rectal examination (DRE) is currently recommended for population screening for prostate cancer in Australia. Men who are concerned about their risk of prostate cancer, should discuss screening with their doctor. Doctors should help such men to make a fully informed decision whether or not to commence regular PSA screening. If a decision is made to commence an individual screening program, starting from 50 years of age is generally considered appropriate, with an interval of 1–2 years between PSA tests. The balance of benefits of early detection of prostate cancer and its harms (particularly the side effects of investigation of an elevated PSA and treatment, and the possibility of unnecessary treatment for cancers that would never have been diagnosed except for PSA screening) remain a subject of debate.

### Recommendations: Prostate cancer prevention and detection

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td>Men at average risk</td>
<td>The decision to conduct prostate specific antigen (PSA) testing and digital rectal examination (DRE) should be individualised as population based screening is not recommended</td>
<td>Opportunistic</td>
<td>IID</td>
<td>91–100</td>
</tr>
<tr>
<td></td>
<td>Men at potentially higher risk due to family history</td>
<td></td>
<td></td>
<td></td>
<td>89,90</td>
</tr>
</tbody>
</table>
Resources
The early detection of prostate cancer in general practice: GP/patient show card

Let sleeping dogs lie? What men should know before getting tested for prostate cancer

References
technology policy.


41. Australian Institute of Health and Welfare & National Breast and Ovarian Cancer Centre. Breast cancer in
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National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people

Prevention and early detection of cancer


Chapter 16

Preventive health for the elderly
Overview

Aboriginal and Torres Strait Islander communities have different age structures from the non-Indigenous population, due to high fertility and increased mortality at all ages, giving a much lower median age (20.2 years vs 36.3 years). The aged population is therefore smaller as a proportion, with 7% of Aboriginal and Torres Strait Islander people being over 55 years and only 3% over 65 years. The corresponding figures for non-Indigenous Australians are 22% and 13% respectively.\(^1\) In 2006 this amounted to 40 297 Aboriginal and Torres Strait Islander people over 55 years, or 0.8% of the over 55 years total Australian population. This contrasts with almost 5 million non-Indigenous people in the same age group. Of the total Australian population aged 75 years and older, only 0.4% (5000 people) identify as Aboriginal and/or Torres Strait Islander. However, demographic shifts are occurring, and the number of Aboriginal and Torres Strait Islander people over 55 years is projected to double between 2006 and 2021.\(^2\) The care of the elderly is becoming more important as the population ages. In addition, many of the disorders which affect elderly people occur at younger ages for Aboriginal and Torres Strait Islander people.

Many areas of preventive care for the elderly are covered in other chapters of the National Guide, in particular vision (Chapter 6), hearing (Chapter 7), respiratory disease (Chapter 11) and cardiovascular health (Chapter 12). This chapter will cover three important issues relating to the elderly not covered elsewhere in the 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 is usually diagnosed 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 person aged 30 years of the same sex. 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 osteopaenia.

Osteoporosis is common in the general population, with 27% of women and 11% of men over 60 years of age meeting the WHO criteria for osteoporosis. The lifetime risk of a minimal trauma fracture is approximately 56% for women aged over 60 years and 29% for men aged over 60 years. These fractures can occur at sites other than the classic osteoporotic sites of wrist, hip and vertebra.

Little is known, however, about the prevalence of osteoporosis in Aboriginal and Torres Strait Islander people. One study from Cairns found that the age standardised rate of hip fracture among Aboriginal and Torres Strait Islander people was similar to non-Indigenous people, though in that study the fractures in Aboriginal and Torres Strait Islander women tended to occur at a somewhat older age.

A number of factors increase the risk of osteoporotic fractures. Women have approximately double the lifetime risk of men. Fracture incidence increases exponentially with age in both men and women, approximately doubling with each decade. A previous fracture doubles the risk of subsequent fracture, and a previous vertebral fracture increases the risk of a further vertebral fracture 4–5 times. 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). A history of falls at least doubles the risk of an osteoporotic fracture compared to non-fallers.

A family history of fragility fractures after age 50 years, kyphosis or diagnosed osteoporosis in a father, mother and sister increase the risk of osteoporotic fractures. A meta-analysis found smoking increases the risk of osteoporosis after the menopause with an average of 2% greater bone density loss per decade for smokers compared with non-smokers. Smokers had a 17% increased risk of hip fracture at age 60 and a 108% increased risk at age 90 compared with non-smokers after adjusting for other risk factors. There was also a dose-response relationship between the number of cigarettes smoked per day and the risk of hip fracture. Low body mass index has also been shown to be associated with lower bone density after menopause, and more rapid bone loss than in heavier women. 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 certain anti-epileptic drugs.

A fracture risk calculator has been developed based on data from the Dubbo Osteoporosis Epidemiology Study (see Resources). An individual’s age, gender, fracture and fall history and BMD are used to calculate an estimated 5 and 10 year absolute fracture risk for both hip fracture and any fragility fracture.
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 white bread, sardines and calcium enriched soy milk. Adequate dietary intake has been shown to be as effective as supplements. For people unable to achieve adequate intake through diet alone, supplementation is necessary. Dietary intake should especially be assessed in people who are commencing specific anti-osteoporosis therapies.

Vitamin D
Vitamin D is primarily formed in the skin from sunlight exposure although small amounts are found in the diet. It has been estimated that fair-skinned people in Australia can produce adequate vitamin D with sun exposure to their face, arms and hands for a few minutes either before 10 am or after 3 pm on most days of the week. In winter in southern parts of Australia this exposure may need to be longer. People with darker skin require more sun exposure. 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 (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 should be reserved for those at high risk. In addition, 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 60 nmol/L.

Exercise
Regular, high intensity weightbearing exercise has been shown to slow bone density loss in postmenopausal women and older men. For bone health, short, intense exercise sessions are better than prolonged, less intense exercise. People without osteoporosis should be encouraged to exercise at least three times weekly for 1 year to improve BMD, and ideally they should participate in 30–40 minute sessions 4–6 times per week. Walking, jogging, dancing, tennis and strength and resistance training are recommended. There is some evidence that regular exercise throughout the lifespan increases bone density. Children and adolescents who are more active achieve higher bone density, and this is maintained into middle age.

People diagnosed with osteoporosis need to have these recommendations modified because of their increased risk of fracture. They should undergo high intensity strength training and low impact weightbearing exercise. High intensity strength training is the use of moderate to high overload resistance to increase muscle strength and BMD. Low impact weightbearing exercise is defined as exercise performed while standing but with one foot always on the floor. High impact activities such as jumping are not appropriate for people with established osteoporosis. In addition, people with osteoporosis may benefit from flexibility and balance training to reduce the risk of falls. A physiotherapist, exercise physiologist or other appropriately trained professional should supervise the introduction of an exercise program for people with osteoporosis.
Smoking cessation
The increased risk of fracture significantly declines from around 10 years after giving up smoking.18

Pharmacological treatment
Bisphosphonates may be used in both primary prevention and after osteoporosis is established. Note that they have been shown to be effective in primary prevention (in postmenopausal women at risk of osteoporosis) but are not listed on the Pharmaceutical Benefits Scheme (PBS) for this indication.

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. However there are a number of adverse effects including an increased risk of invasive breast cancer, stroke and thromboembolic events. The potential benefits and harms must be carefully considered. Long term use is not recommended by existing guidelines.5

Strontium
Strontium ranelate has been shown to decrease BMD loss in early postmenopausal women. It is not approved on the PBS for primary prevention but is approved for the treatment of established osteoporosis.

Table 16.1. Risk levels for osteoporosis

<table>
<thead>
<tr>
<th>Average risk</th>
<th>Moderate risk</th>
<th>High risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>All postmenopausal women and men over 50 years of age</td>
<td>Age 60–70 years and any of the following:</td>
<td>• Previous fracture due to minimal trauma</td>
</tr>
<tr>
<td></td>
<td>• family history of osteoporotic fractures</td>
<td>• Vertebral fractures</td>
</tr>
<tr>
<td></td>
<td>• hypogonadism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• prolonged glucocorticoid use (&gt;3 months)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• inflammatory conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• malabsorption, eg. coeliac disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• hyperparathyroidism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• hyperthyroidism</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• smoking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• history of a fall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• age over 70 years</td>
<td></td>
</tr>
</tbody>
</table>
## Recommendations: Osteoporosis

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All postmenopausal women and men over 50 years of age</td>
<td>Assess risk factors for osteoporosis (see Table 16.1)</td>
<td>As part of an annual health assessment</td>
<td>IIB</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>People at moderate and high risk (see Table 16.1)</td>
<td>Recommend dual energy X-ray absorptiometry (DXA) to determine bone mineral density (BMD) If DXA confirms osteoporosis then manage as high risk</td>
<td>At baseline, then 2 yearly if needed</td>
<td>IA</td>
<td>5</td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All postmenopausal women and men over 50 at all levels of risk</td>
<td>Advise adequate dietary calcium intake: 1300 mg/day for women over 50 and men over 70; 1000 mg/day for men 50–70 years</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IA</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommend smoking cessation (see Chapter 1: Lifestyle, section on smoking)</td>
<td></td>
<td>IA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Recommend maintenance of a healthy weight and body mass index (see Chapter 1: Lifestyle, section on overweight/obesity)</td>
<td></td>
<td>GPP</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advise adequate but safe sunlight exposure as a source of vitamin D*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>People at average and moderate risk (see Table 16.1)</td>
<td>Advise regular high intensity weightbearing exercise for postmenopausal women and older men aiming to achieve a target of 30 minutes/day on most days of the week (see Chapter 1: Lifestyle, section on physical activity)</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>IA</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>People at high risk (see Table 16.1)</td>
<td>Advise regular low impact weightbearing exercise as part of a tailored program emphasising improved balance and flexibility</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>GPP</td>
<td>5</td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td>All postmenopausal women and men over 50 at all levels of risk</td>
<td>Consider calcium supplementation for those with inadequate dietary intake Also consider vitamin D supplementation for those with inadequate sunlight exposure, particularly those in residential care</td>
<td>Opportunistic and as part of an annual health assessment</td>
<td>ID</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>People at moderate and high risk (see Table 16.1)</td>
<td>Consider bisphosphonates in conjunction with calcium and vitamin D supplementation</td>
<td>At diagnosis</td>
<td>IA</td>
<td>5</td>
</tr>
</tbody>
</table>
### Recommendations: Osteoporosis (continued)

| People at high risk (see Table 16.1) | If the above medications are ineffective or contraindicated consider selective oestrogen receptor modulators (raloxifene) or parathyroid hormone (teriparatide)§
| Consider hormone replacement therapy to increase BMD and reduce fracture risk. Long term use is not recommended due to increased potential for harm, particularly increased breast cancer and cardiovascular disease risk.
| Consider strontium ranelate‡

| At diagnosis IIC | 5 |

| Environmental | People at moderate and high risk |
| Consider a multifactorial falls reduction program (see Falls recommendations below) |

| At diagnosis ID | 5 |

* Fair-skinned people in Australia can produce adequate vitamin D with sun exposure to their face, arms and hands for a few minutes either before 10 am or after 3 pm on most days of the week. In winter in southern parts of Australia this exposure may need to be longer. People with darker skin generally require more sun exposure.16

† Bisphosphonates are subsidised under the PBS for the following conditions: concurrent use of oral corticosteroids (>7.5 mg/day) for 3 months or more and a BMD T-score of –1.5 or less, women aged ≥70 years with a BMD T-score of –2.5 or less, any person with a radiologically confirmed fracture due to minimal trauma

‡ Strontium is subsidised under the PBS for the following conditions: women aged >70 years with a BMD T-score of –3.0 or less, all people with a radiologically confirmed fracture due to minimal trauma

§ Refer to clinical practice guidelines for specific treatment recommendations.19

‖ Selective oestrogen receptor modulators and teriparatide are not subsidised under the PBS in the absence of a fracture due to minimal trauma. Recommend review the PBS for specific criteria.

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### Resources

- Fracture risk calculator
  - [www.fractureriskcalculator.com](http://www.fractureriskcalculator.com)

- RACGP guidelines

- RACGP algorithm for the detection, prevention and treatment of osteoporosis

- Guidelines for exercise in preventing and treating osteoporosis

- Risks and benefits of sun exposure
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’. 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. Half of all falls occur in the home, mostly during the day, and mostly due to ‘slipping, tripping and stumbling’. 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. 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. 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 people 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. 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 years age group is increasing rapidly, and the number of falls in the elderly may increase proportionally.
## Recommendations: Falls prevention

<table>
<thead>
<tr>
<th>Preventive intervention type</th>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/ strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All people aged ≥50 years at all risk levels</td>
<td>Assess for risk factors for falls (see Table 16.2)</td>
<td>Annually</td>
<td>IA</td>
<td>24,25</td>
<td></td>
</tr>
<tr>
<td>Residents of aged care facilities (RACFs)</td>
<td>RACF staff should screen for risk factors for falls to allow for an individualised fall prevention plan</td>
<td>6 monthly</td>
<td>IIB</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>People with a past history of falls</td>
<td>Recommend a detailed assessment including the following: • cardiac and neurological disease assessment • medication review • assessment of vision, gait and balance • home environment assessment</td>
<td>Opportunistic</td>
<td>IA</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Those with falls due to carotid sinus hypersensitivity</td>
<td>Consider referral for pacemaker insertion</td>
<td>As needed</td>
<td>IIC</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Those with vision threatening cataract disease</td>
<td>Referral for cataract surgery</td>
<td>As needed</td>
<td>IIC</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td><strong>Behavioural</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>All people aged ≥50 years</td>
<td>Recommend exercise which may include the following modalities: • multicomponent group exercise (defined as targeting at least two of the following: strength, balance, endurance and flexibility) • tai chi as a group exercise • individually prescribed exercise to be carried out at home as per Australian physical activity guidelines (see Chapter 1: Lifestyle, section on physical activity)</td>
<td>As part of an annual health assessment</td>
<td>IA</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>People at high risk</td>
<td>Recommend gait, balance and functional coordination exercises as part of a multifactorial intervention</td>
<td>As part of an annual health assessment</td>
<td>IIC</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td><strong>Chemoprophylaxis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People aged ≥50 years with known vitamin D deficiency or inadequate exposure to sunlight</td>
<td>Consider vitamin D supplementation (see also osteoporosis section)</td>
<td>As part of an annual health assessment</td>
<td>IC</td>
<td>27,28</td>
<td></td>
</tr>
<tr>
<td>People at high risk taking medications</td>
<td>Review medications</td>
<td>At least annually and recommend 6 monthly for people taking four or more medications</td>
<td>IIB</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>
If taking psychotropic medications, review the indications and consider gradual withdrawal if clinically appropriate. Opportunistic and as part of an annual health assessment.

Consider home medication review by a pharmacist. Annually or when there is a clinical need.

People in RACFs

Arrange medication review by a pharmacist. Annually.
Consider vitamin D supplementation. Ongoing.

All people aged >50 years not at high risk

Home assessment and intervention is not recommended. N/A.

People at high risk

Arrange for home assessment and intervention involving a multidisciplinary team. One-off for those with poor vision; opportunistic for all others.

People in RACFs who are at high risk of falls

Consider use of hip protectors. Opportunistic.

---

**Table 16.2. Risk factors for falls**

- Increasing age
- Past history of falls
- Neurological conditions: stroke, Parkinson 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

Source: The RACGP 200924
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. In general, consciousness is not impaired but thinking is disordered. Impairment in activities of daily living or in social or occupational functioning are required to meet diagnostic criteria for the International Classification of Diseases, Version 10 (ICD-10) and the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, Text Revision (DSM-IV-TR) respectively.

In Australia, Alzheimer 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 causes about 15% of cases and has some distinguishing features such as prominent visual hallucinations and parkinsonian motor signs. Frontotemporal dementia is responsible for 5% of cases but proportionately more cases of early onset dementia, and is distinguished by prominent behavioural symptoms, personality change and impaired executive function. There are also many less common 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 (2-fold increase), fracture (3-fold increase), delirium (5-fold increase), depression and epilepsy (6-fold increase). They are also at increased risk of oral disease, malnutrition and weight loss and urinary incontinence. Few studies have been undertaken into the prevalence of dementia in Aboriginal and Torres Strait Islander populations. Zann’s 1987 study reported a prevalence of 20% for dementia or suspected dementia in Aboriginal and Torres Strait Islander people aged over 65 years in northern Queensland. Following the development of the Kimberley Indigenous Cognitive Assessment tool, a prevalence study in the Kimberley documented a dementia prevalence of 12.4% in those over aged 45 years and 26.8% in those aged over 65 years, or five times the rate in the overall Australian population.

In that population, factors associated with dementia included older age, male gender and no formal education. After adjusting for age, gender and education, dementia was associated with current smoking, previous stroke, epilepsy, head injury, poor mobility, incontinence and falls. This suggests that population based interventions to reduce the incidence of dementia should include smoking cessation and better control of vascular disease risk factors. Better education for Aboriginal and Torres Strait Islander children may provide some protection from dementia in the longer term, as may interventions to prevent head injury.
Interventions

Screening for dementia has not been recommended in guidelines published to date. However, there are increasing calls to consider introducing screening because there is some evidence that early non-pharmacological intervention may improve cognitive outcomes for people with early cognitive impairment. Screening may allow 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. However, there may be significant stigma associated with a diagnosis of dementia, and by definition, screening involves detecting cases while they are asymptomatic. Older Aboriginal and Torres Strait Islander people have important roles in culture and community and these may be able to continue to be performed adequately when a person has mild cognitive impairment. Thus, current guidelines recommend case finding (asking about those with symptoms who may need further evaluation) rather than screening. 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 and the General Practitioner Assessment of Cognition (GPCOG) require English skills and results will be dependent on the level of schooling attained. The Kimberley Indigenous Cognitive Assessment has been developed for use with people living in rural and remote areas, and those who may have had little formal schooling. Interpreters may be required for the assessment.

There is evidence of benefit from cholinesterase inhibitors (donepezil, rivastigmine, galantamine) for the management of mild to moderate 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.
### Recommendations: Dementia

#### Preventive intervention type

<table>
<thead>
<tr>
<th>Who is at risk?</th>
<th>What should be done?</th>
<th>How often?</th>
<th>Level/strength of evidence</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asymptomatic people</td>
<td>Dementia screening is not routinely recommended</td>
<td>N/A</td>
<td>IIIC 38–40,44</td>
<td></td>
</tr>
</tbody>
</table>
| People with symptoms such as memory loss or behaviour change, or if there are concerned family members | Consider administration of one of the following cognitive screening tests:  
- Mini Mental State Examination  
- General Practitioner Assessment of Cognition  
- Kimberley Indigenous Cognitive Assessment (see Resources) | Opportunistic | GPP 24,33,42,45,46         |            |
| **Behavioural** | Management of dementia risk factors is recommended for multiple health benefits, however, there is limited evidence that this leads to a reduction in dementia incidence | Opportunistic | GPP 36,39,47               |            |
| People with risk factors for dementia including excessive alcohol intake, tobacco smoking hypertension, diabetes, depression |                      |            |                            |            |
| **Chemoprophylaxis** | Anti-dementia drugs are not recommended | N/A        | 1B 43                      |            |
| People without a confirmed diagnosis of dementia |                      |            |                            |            |

### Resources

Care of patients with dementia in general practice (The Royal Australian College of General Practitioners and NSW Health)


Kimberley Indigenous Cognitive Assessment


General Practice Assessment of Cognition


### References


Appendix 1

Australian cardiovascular risk charts

<table>
<thead>
<tr>
<th>Risk level for 5 year cardiovascular (CVD) risk</th>
<th>10–15%</th>
<th>≤5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥30%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25–29%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20–24%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16–19%</td>
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</tr>
</tbody>
</table>

Notes: The risk charts include values for SBP alone, as this is the most informative of conventionally measured blood pressure parameters for cardiovascular risk. CVD refers collectively to coronary heart disease (CHD), stroke and other vascular disease including peripheral arterial disease and renovascular disease. Charts are based on the NODP’s Guidelines for the assessment of absolute cardiovascular disease risk and adapted with permission from New Zealand Guidelines Group: New Zealand Cardiovascular Guidelines Handbook: A Summary Resource for Primary Care Practitioners. Second edition. Wellington, NZ: 2009. www.nzgp.org.nz.

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 increased absolute risk of CVD.

Charts in this age bracket are for use in Aboriginal and Torres Strait Islander populations only.
1. How to use the risk charts

Within the chart, choose the cell nearest to the person's diabetes status, sex, smoking history and age. 'Smoker' is defined as either current daily cigarette smoker or former smoker who has quit within the previous 12 months. The charts should be used for all adults aged 45–74 years (and all Aboriginal and Torres Strait Islander adults aged 35 years and older) without known history of CVD or already known to be at 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 35–44 years and have a TC:HDL ratio of less than 4.5 and a SBP of less than 130 mm Hg.
   - SBP (mean of two readings on two occasions).
   - Total cholesterol/high-density lipoprotein cholesterol (HDL-C) ratio (ensure correct ratio is used).

3. The colour of the cell that the person falls into provides their 5-year absolute cardiovascular risk level (see legend above for risk category). For people who fall exactly on a threshold between cells, use the cell corresponding to higher risk. The risk calculator may underestimate cardiovascular risk in these groups:
   - Aboriginal and Torres Strait Islander adults
   - adults with diabetes aged 60 years or less
   - adults who are overweight or obese
   - socioeconomically deprived groups.

* In accordance with Australian guidelines, patients with systolic blood pressure ≥160 mm Hg, or a total cholesterol of >7.5 mmol/L, should be considered at increased absolute risk of CVD.

How to use the risk charts

1. Identify the table relating to the person's diabetes status, sex, smoking history and age. 'Smoker' is defined as either current daily cigarette smoker or former smoker who has quit within the previous 12 months. The charts should be used for all adults aged 45–74 years (and all Aboriginal and Torres Strait Islander adults aged 35 years and older) without known history of CVD or already known to be at 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 35–44 years and have a TC:HDL ratio of less than 4.5 and a SBP of less than 130 mm Hg.
   - SBP (mean of two readings on two occasions).
   - Total cholesterol/high-density lipoprotein cholesterol (HDL-C) ratio (ensure correct ratio is used).

3. The colour of the cell that the person falls into provides their 5-year absolute cardiovascular risk level (see legend above for risk category). For people who fall exactly on a threshold between cells, use the cell corresponding to higher risk. The risk calculator may underestimate cardiovascular risk in these groups:
   - Aboriginal and Torres Strait Islander adults
   - adults with diabetes aged 60 years or less
   - adults who are overweight or obese
   - socioeconomically deprived groups.

* In accordance with Australian guidelines, patients with systolic blood pressure ≥160 mm Hg, or a total cholesterol of >7.5 mmol/L, should be considered at increased absolute risk of CVD.

Risk level for 5 year cardiovascular (CVD) risk

<table>
<thead>
<tr>
<th>High risk</th>
<th>Moderate risk</th>
<th>Low risk</th>
</tr>
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<tbody>
<tr>
<td>≥30%</td>
<td>10–15%</td>
<td>5–9%</td>
</tr>
<tr>
<td>25–29%</td>
<td></td>
<td>&lt;5%</td>
</tr>
<tr>
<td>20–24%</td>
<td></td>
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</tr>
<tr>
<td>16–19%</td>
<td></td>
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</tr>
</tbody>
</table>

© Heart Foundation Guide to management of hypertension 2008
### Appendix 2
### Abbreviations used in this guide

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>13vPCV</td>
<td>13-valent pneumococcal conjugate vaccine</td>
</tr>
<tr>
<td>23vPPV</td>
<td>23-valent pneumococcal polysaccharide vaccine</td>
</tr>
<tr>
<td>7vPCV</td>
<td>7-valent pneumococcal conjugate vaccine</td>
</tr>
<tr>
<td>AAP</td>
<td>American Academy of Pediatrics</td>
</tr>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>ACCHS</td>
<td>Aboriginal Community Controlled Health Services</td>
</tr>
<tr>
<td>ACE</td>
<td>angiotensin converting enzyme</td>
</tr>
<tr>
<td>ACIR</td>
<td>Australian Childhood Immunisation Register</td>
</tr>
<tr>
<td>ACR</td>
<td>albumin-creatinine ratio</td>
</tr>
<tr>
<td>AF</td>
<td>atrial fibrillation</td>
</tr>
<tr>
<td>AFP</td>
<td>alpha-fetoprotein</td>
</tr>
<tr>
<td>AHMAC</td>
<td>Australian Health Ministers’ Advisory Council</td>
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<tr>
<td>AHW</td>
<td>Aboriginal and Torres Strait Islander health worker</td>
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<td>AIDS</td>
<td>acquired immunodeficiency syndrome</td>
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<tr>
<td>Anti-HBs</td>
<td>anti-hepatitis B surface antigen (antibody)</td>
</tr>
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<td>AOM</td>
<td>acute otitis media</td>
</tr>
<tr>
<td>APGAR</td>
<td>Appearance, Pulse, Grimace, Activity, Respiration [newborn assessment tool]</td>
</tr>
<tr>
<td>APSGN</td>
<td>acute post-streptococcal glomerulonephritis</td>
</tr>
<tr>
<td>ARB</td>
<td>angiotensin receptor blocker</td>
</tr>
<tr>
<td>ARF</td>
<td>acute rheumatic fever</td>
</tr>
<tr>
<td>ARI</td>
<td>acute respiratory illness</td>
</tr>
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<td>ASHM</td>
<td>Australasian Society for HIV Medicine</td>
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<td>AUDIT</td>
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</tr>
<tr>
<td>AUDIT-C</td>
<td>Alcohol Use Disorders Identification Test – Consumption</td>
</tr>
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<td>Diabetes Australia</td>
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<td>beta human chorionic gonadotropin</td>
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<td>BMD</td>
<td>bone mineral density</td>
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<td>BMI</td>
<td>body mass index</td>
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<td>blood pressure</td>
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<td>breast cancer susceptibility gene</td>
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<td>CKD-EPI</td>
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<td>CSO</td>
<td>Community Services Obligation</td>
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<td>CSOM</td>
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<td>disability adjusted life years</td>
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<td>decibel</td>
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<td>decibel hearing level</td>
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<td>diastolic blood pressure</td>
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<td>dimercaptosuccinic acid (scan)</td>
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<td>electrocardiogram</td>
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<td>ECHO</td>
<td>echocardiogram</td>
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<td>eGFR</td>
<td>estimated glomerular filtration rate</td>
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<tr>
<td>EIA</td>
<td>enzyme immunoassay</td>
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<td>enzyme immunoassay Treponema pallidum haemagglutination assay</td>
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<td>ear nose and throat</td>
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<td>ESR</td>
<td>erythrocyte sedimentation rate</td>
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<td>environmental tobacco smoke</td>
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<td>FDA</td>
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<td>FEV1</td>
<td>forced expiratory capacity in 1 second</td>
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<td>FOBT</td>
<td>faecal occult blood test</td>
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<td>fasting plasma glucose</td>
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<td>Description</td>
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<td>FTA-Abs</td>
<td>Fluorescent treponemal antibody – absorption</td>
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<td>FTT</td>
<td>Failure to thrive</td>
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<td>Forced vital capacity</td>
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<td>Group A Streptococcus (bacteria)</td>
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<td>Glomerular filtration rate</td>
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<td>Glucose tolerance test</td>
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<td>Hepatitis B surface antibody</td>
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<td>Human chorionic gonadotropin</td>
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<td>High density lipoprotein</td>
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<td>Home, Education, Eating, Activities, Drugs, Sexuality, Suicidality, Safety [screening tool]</td>
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<td>Hereditary non-polyposis colorectal cancer</td>
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<td>Human papillomavirus</td>
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<td>Hormone replacement therapy</td>
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<td>High grade squamous intraepithelial lesion</td>
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<td>Herpes simplex virus</td>
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<td>International Classification of Disease 10th edition</td>
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<td>International Diabetes Federation</td>
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<td>IFG</td>
<td>Impaired fasting glucose</td>
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<td>Impaired glucose tolerance</td>
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<td>IM</td>
<td>Intramuscular</td>
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<td>Invasive pneumococcal disease</td>
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<td>Long acting reversible contraception</td>
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<td>LRTI</td>
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<td>Left ventricular hypertrophy</td>
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<td>MCH</td>
<td>Micturating cystourethrogram</td>
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<td>MHR</td>
<td>Maximum heart rate</td>
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<td>MI</td>
<td>Myocardial infarction</td>
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<td>Micronutrient</td>
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<td>MoBa</td>
<td>Norwegian Mother and Child Cohort Study</td>
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<td>MRI</td>
<td>Magnetic resonance imaging</td>
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<td>MSM</td>
<td>Men who have sex with men</td>
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<td>MSS</td>
<td>Maternal serum screening</td>
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<td>Multisystemic Treatment [program]</td>
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<td>Nucleic acid amplification test</td>
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<td>National Indigenous Eye Health Survey</td>
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<td>National Immunisation Program Schedule</td>
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<td>NNT</td>
<td>Number needed to treat</td>
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<td>Nicotine replacement therapy</td>
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<td>Needle syringe program</td>
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<td>National Vascular Disease Prevention Alliance</td>
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<td>OR</td>
<td>Odds ratio</td>
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<td>Oral contraceptive pill</td>
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<td>Oral glucose tolerance test</td>
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<td>OM</td>
<td>Otitis media</td>
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<tr>
<td>OME</td>
<td>Otitis media with effusion</td>
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<td>Opioid substitution therapy</td>
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<td>Pregnancy-associated plasma protein A</td>
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<td>PBS</td>
<td>Pharmaceutical Benefits Scheme</td>
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<td>PCHL</td>
<td>Permanent congenital hearing loss</td>
</tr>
<tr>
<td>PCI</td>
<td>Percutaneous coronary intervention</td>
</tr>
<tr>
<td>PCR</td>
<td>Polymerase chain reaction</td>
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<td>PCR</td>
<td>Protein-creatinine ratio</td>
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<td>PCV</td>
<td>Pneumococcal conjugate vaccine</td>
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<td>Acronym</td>
<td>Description</td>
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<td>PEDS</td>
<td>Parents' Evaluation of Developmental Status (screening tool)</td>
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<td>post exposure prophylaxis</td>
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<td>pelvic inflammatory disease</td>
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<td>PIP</td>
<td>Practice Incentives Program</td>
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<td>ppm</td>
<td>parts per million</td>
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<td>prostate-specific antigen</td>
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<tr>
<td>PSV</td>
<td>polysaccharide vaccine</td>
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<td>peripheral vascular disease</td>
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<td>residential aged care facility</td>
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<td>RACGP</td>
<td>[The] Royal Australian College of General Practitioners</td>
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<td>randomised controlled trial</td>
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<td>rheumatic heart disease</td>
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<td>rapid plasma reagin</td>
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<td>Surgery, Antibiotics, Facial (cleanliness), Environmental measures</td>
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<td>standard deviation</td>
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<td>transient ischaemic attack</td>
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<td>Treponema pallidum particle agglutination assay</td>
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<td>Trachomatous trichiasis</td>
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<td>United States Preventive Services Taskforce</td>
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<td>ultraviolet B</td>
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<td>visual acuity</td>
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<td>vesico-ureteric reflux</td>
</tr>
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<td>WHO</td>
<td>World Health Organization</td>
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