

Preventing progression to type 2 diabetes

Recommendations

Recommendation	Reference	Grade*
People with impaired glucose tolerance (IGT) or impaired fasting glucose (IFG) should be referred to lifestyle intervention programs to: <ul style="list-style-type: none"> • achieve and maintain a 7% reduction in weight • increase moderate-intensity physical activity to at least 150 minutes per week 	1 American Diabetes Association, 2019	A
People with glycosylated haemoglobin (HbA1c) 6.0–6.4% may also benefit from a structured weight loss and exercise program to reduce their risk of developing type 2 diabetes	2 Diabetes Canada, 2018	D, consensus

*Refer to '[Explanation and source of recommendations](#)' for explanations of the levels and grades of evidence.

Clinical context

Defining risk

Risk factors for type 2 diabetes include:³

- demographic and social factors – age, family history, ethnicity
- lifestyle factors – obesity, physical inactivity, smoking
- clinical history – high blood pressure, high triglycerides and low high-density lipoprotein cholesterol (HDL-C), gestational diabetes, heart disease, stroke, depression, polycystic ovary syndrome, acanthosis nigrans and non-alcoholic fatty liver disease
- medications – including corticosteroids and antipsychotic medications.

Clinicians should be alert to the possibility of type 2 diabetes in patients with these risk factors, many of which are also risk factors for cardiovascular disease (CVD).

The 'metabolic syndrome' (defined by the presence of at-risk measures for waist circumference, triglycerides, HDL-C, blood pressure and fasting glucose⁴) confers a three- to five-fold risk of type 2 diabetes as well as an increased risk for CVD.⁵

Patients with non-alcoholic fatty liver are at twice the risk of developing type 2 diabetes.⁶

Particular population groups are also at greater risk, such as people with Pacific Islander, Southern European or Asian backgrounds (refer to the discussion of 'Who is at risk of type 2 diabetes?' in the section '[Defining and diagnosing type 2 diabetes](#)'). Aboriginal and Torres Strait Islander peoples have more than three times the prevalence of type 2 diabetes compared with the wider population.⁷ Waist circumference has been found to be a strong predictor of the risk of developing type 2 diabetes, especially in Aboriginal women.⁸ Prevention programs that are culturally appropriate for Aboriginal and Torres Strait Islander peoples have been implemented successfully, although evidence for their effectiveness is limited – refer to Chapter 12 of The Royal Australian College of General Practitioners' [National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people \(3rd edition\)](#).

Other groups particularly at high risk of developing type 2 diabetes are people with impaired fasting glucose (IFG), impaired glucose tolerance (IGT) or gestational diabetes.^{9,10} Refer to the section '[Defining and diagnosing type 2 diabetes](#)' for definitions of these states.

Progression to type 2 diabetes in people at high risk

About 5–10% of people at high risk develop diabetes annually.¹¹ Three quarters of people with IFG or IGT will develop type 2 diabetes over their lifetime.¹² People with IFG or IGT whose glucose metabolism returns to normal, either as a result of interventions or spontaneously, have roughly half the risk of developing type 2 diabetes compared with those who are persistently abnormal.¹³

Women with a history of gestational diabetes have approximately a seven-fold elevated risk of future development of type 2 diabetes.^{10,14–16}

Evidence for lifestyle interventions to prevent type 2 diabetes

In randomised controlled trials, intensive lifestyle interventions have been shown to reduce the rates of progression to type 2 diabetes by 27–45% over periods ranging from 10 to 23 years.¹⁷ It remains unclear whether diabetes lifestyle intervention directly reduces complication-related morbidity and mortality.¹⁸

People at high risk of type 2 diabetes should also be offered lifestyle interventions to help them increase physical activity to at least 150 minutes per week, and to achieve and maintain a 7% reduction in weight. This may involve individual or group education and coaching.

In women with a history of gestational diabetes, beginning lifestyle interventions soon after pregnancy has been shown to reduce the incidence of type 2 diabetes by 25%.¹⁹

Other interventions

There is evidence that, in high-risk patients, metformin reduces the relative risk of developing type 2 diabetes by approximately 25%, and also reduces progression to renal and eye complications.^{20,21} However, metformin is not licensed by the Therapeutic Goods Administration for this use in Australia.

There have been no randomised controlled trials of the effect of bariatric surgery on preventing progression to type 2 diabetes.

In practice

Identifying people at high risk of type 2 diabetes

Identifying risk factors for type 2 diabetes is a routine part of general practice. The RACGP's [Guidelines for preventive activities in general practice \(9th edition\)](#) recommend assessing body mass index (BMI), waist circumference, diet and physical activity in adults every two years. Screening for diabetes risk with the Australian type 2 diabetes risk assessment tool (AUSDRISK) is recommended in all adults aged ≥40 years every three years.²²

Refer to the section '[Defining and diagnosing type 2 diabetes](#)' for information about assessing diabetes risk and screening recommendations for diabetes, IFG and IGT.

Interventions to manage diabetes risk

Patients at high risk of type 2 diabetes are also at increased risk of cardiovascular disease. Their cardiovascular risk should thus be assessed, and lifestyle change and medications considered where appropriate.²³ Refer to the section '[Type 2 diabetes and cardiovascular risk](#)'.

Particular lifestyle interventions have been shown to reduce the risk of type 2 diabetes in people with IGT, but not people with IFG alone. These interventions are of moderate intensity; for example, at least 16 sessions of 1–2 hours focusing on diet and physical activity delivered over six months by a range of health professionals. Patients should achieve at least 150 minutes per week of physical activity²⁴ and a low-energy diet rich in fruit, vegetables and fibre, and low in meat and fat.

Maintaining lifestyle change, especially weight loss, in high-risk patients can be difficult. Technology-assisted modalities, including ‘apps’ that support change in diet and physical activity, activity trackers and websites providing information and referral options, are promising for helping people maintain physical activity and weight loss.²⁵

Intensive lifestyle intervention may be beyond the scope of the brief interventions routinely delivered in general practice or practice nurse consultations, or even by those delivered through allied health visits as part of a care plan. Patients might therefore benefit from referral to a diabetes prevention program. A list of state-based diabetes prevention programs can be found on the [Diabetes Australia](#) website.

Telephone coaching programs run by state and territory governments and health insurance funds have also shown promising results.²⁶

Refer to the RACGP's *Smoking, nutrition, alcohol, physical activity (SNAP)* guide for more information.

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