

Changing the future of youth who have type 2 diabetes

Farrah Rodrigues, Hazel Clothier, Malcolm Clark, Emily Papadimos, Jim Buttery, Danielle Longmore

TYPE 2 DIABETES (T2D) in Australia has reached a crisis point; it is the fastest growing chronic, non-communicable disease.¹ The July 2024 Parliament of Australia report underscored the urgency of addressing this issue,¹ reflecting recommendations from the Diabetes Australia 'State of the Nation 2024' report.² The annual cost for diabetes-related healthcare is \$17.6 million, which is 8% of the Australian health budget; costs increase two-fold for those individuals who experience diabetes-related complications compared to those without complications.²

The issue is even more alarming among youth living with T2D (YT2D), which is characterised as youth aged <25 years with symptoms of hyperglycaemia and one positive laboratory finding (fasting plasma glucose ≥ 7 mmol/L, random plasma glucose ≥ 11.1 mmol/L, 2-hour plasma oral glucose tolerance test ≥ 11.1 mmol/L, HbA1c $\geq 6.5\%$) and negative diabetes autoantibodies.³

YT2D is a more aggressive disease than adult-onset T2D, with higher rates and more rapid onset of diabetes-associated complications (myocardial infarctions, stroke, kidney disease, retinopathy).⁴ Over 80% of youth with T2D develop microvascular complications by their mid-20s and comorbidities are common;⁴ hypertension is present in 10–32% of individuals, microalbuminuria in 14–22%, retinopathy in 9.3%, in addition to high rates of dyslipidaemia and metabolic-associated fatty liver disease.⁴ These youth have a

15-year lower life expectancy compared to those without diabetes.⁵ In addition, YT2D report stigma and shame associated with the condition, and experience high rates of depression, which might impact glycaemic management.^{1,2}

YT2D have been observed across all ethnic groups, but notably affects Aboriginal and Torres Strait Islander people. Social determinants of health play a crucial role in shaping health outcomes and behaviours, often exacerbating the challenges faced by this vulnerable population.^{1,6} Incidence rises during puberty, attributable to the characteristic physiological insulin resistance, which means the age of onset is earlier in girls than boys. Sex difference is not well understood but might be caused by differential sex hormone effects or undiagnosed polycystic ovarian syndrome, which is a risk factor for T2D.³

The pathophysiology of YT2D is uncertain, but obesity, a perceived modifiable risk factor, plays a significant role but is challenging to manage. In Australia, 27.7% of youth aged 5–17 years were overweight or obese in 2022.^{7,8} The relationship between body mass index (BMI) and body fat distribution is highly variable across ethnicities. Other adiposity markers, including waist circumference, might be useful to identify at-risk children.⁸ Examination for acanthosis nigricans as a clinical sign of insulin resistance is recommended.⁸

Early detection, timely and proactive glycaemic monitoring and holistic family centred lifestyle management are paramount to mitigate diabetes complications.⁴ This includes vital supportive, compassionate care around lifestyle changes with

psychological support and consideration of pharmacological/surgical management options.⁸ Large-scale randomised controlled trials of people with 'pre-diabetes' have shown that overt diabetes can be delayed or prevented in up to 58% through early intervention^{2,9} with lifestyle modifications including decreased caloric intake and increased physical activity, which might have long-term impact on risk of cardiovascular disease and all-cause mortality.³ Current data, albeit limited, does not support the use of metformin in prediabetes.⁹ Both general practitioners (GPs) and Aboriginal Community Controlled Health Organisations (primary care providers) play a critical role in the early recognition of pre-diabetes and diagnosis of diabetes; successful YT2D screening programs require engagement of primary care providers.

Primary care providers are encouraged to maintain a high level of vigilance, implementing screening and surveillance for those at high risk of T2D (Figure 1). The most recent version of the Royal Australian College of General Practitioners' (RACGP) *Management of type 2 diabetes: A handbook for general practitioners* has been updated to recognise youth at risk of T2D.¹⁰ We recognise the diagnostic challenge in differentiating the various forms of diabetes in children and taking particular care not to miss the diagnosis of type 1 diabetes.

To improve early detection of youth at risk of T2D, we suggest an update of the RACGP handbook to reflect current national screening recommendations (Figure 1).⁸ National guidelines are currently under review by the Australia and New Zealand Society for Paediatric Endocrinology and

Diabetes; an update is expected in 2025. The AUSDRISK screening tool is easily accessible in primary care software but is only validated for use in adults. The authors of this publication are working to modify this screening tool to reflect young people and improve early detection of T2D.¹¹

All youth aged <18 years diagnosed with T2D should be referred to a paediatric diabetes clinic for ongoing management because of the aggressive nature of the condition, and evolving pharmacotherapies.⁸ Collaboration with primary care providers, particularly in hard-to-reach populations is vital to ensure optimum care in managing YT2D.

Action is needed, and urgently. Diabetes Australia and the Australian Diabetes Society are key advocates in the community and primary care to drive awareness and early diagnosis of YT2D. These efforts are essential to drive meaningful change and ensure broader public and professional engagement. Primary care providers are crucial in the frontline effort against YT2D in the early detection, diagnosis and family based public health measures to reduce the impact of T2D.

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Recommendations

Who should be screened?

Aged 10 years or at the onset of puberty, (whichever occurs earlier) who are overweight (BMI ≥85th percentile) or obese (BMI ≥95th percentile) and/or waist circumference to height ratio >0.5.

AND have one or more of the following risk factors:

- maternal history of diabetes, including gestational diabetes during the child’s gestation
- first-degree relative with T2D
- race or ethnicity - Indigenous populations in Australasia (Aboriginal, Torres Strait Islanders, Māori and Pacific Islander), South Asian, Southeast Asian, Middle Eastern, North African, Latino
- signs of insulin resistance (acanthosis nigricans)
- other conditions associated with obesity and metabolic syndrome (ie hypertension, dyslipidaemia, fatty liver disease, polycystic ovarian syndrome, small for gestational age)
- individuals treated with psychotropic medications.

How to screen?

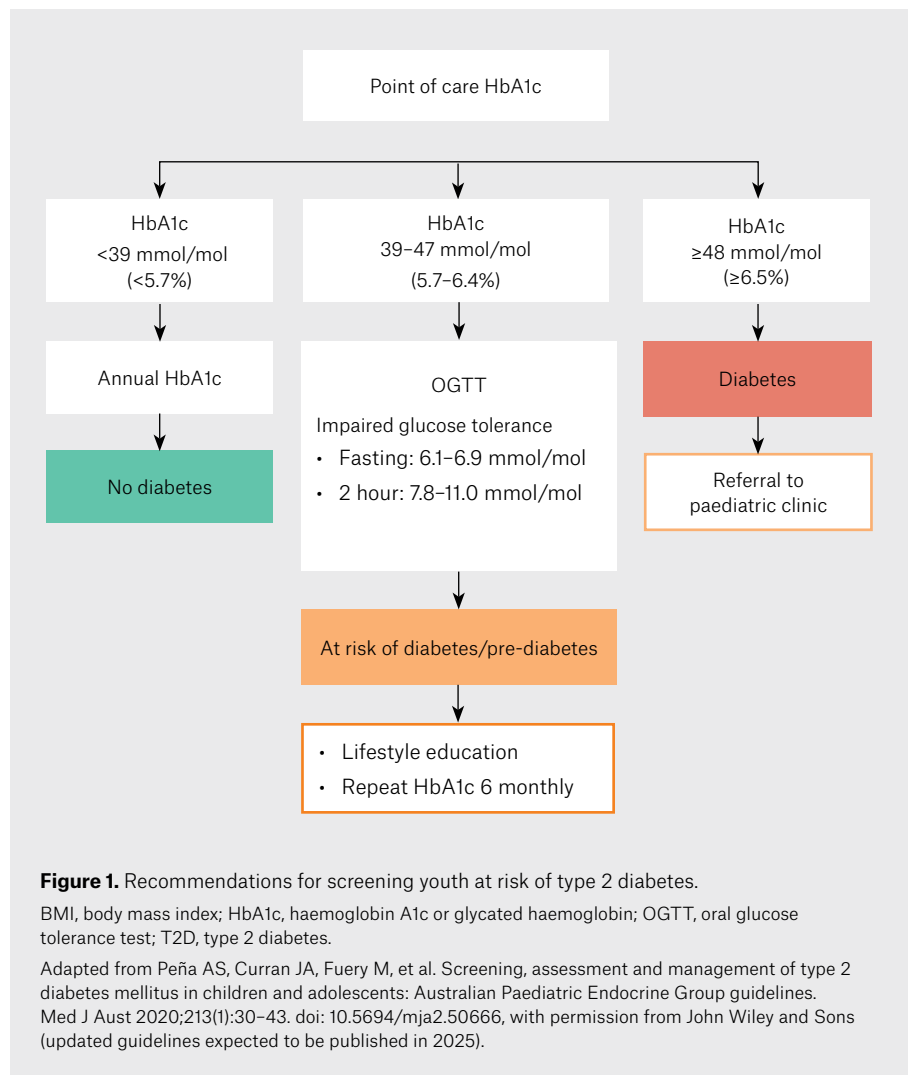


Figure 1. Recommendations for screening youth at risk of type 2 diabetes.

BMI, body mass index; HbA1c, haemoglobin A1c or glycated haemoglobin; OGTT, oral glucose tolerance test; T2D, type 2 diabetes.

Adapted from Peña AS, Curran JA, Fuery M, et al. Screening, assessment and management of type 2 diabetes mellitus in children and adolescents: Australian Paediatric Endocrine Group guidelines. Med J Aust 2020;213(1):30-43. doi: 10.5694/mja2.50666, with permission from John Wiley and Sons (updated guidelines expected to be published in 2025).

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