Cardiovascular disease risk assessment for Aboriginal and Torres Strait Islander adults aged under 35 years: a consensus statement

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Summary

Cardiovascular disease (CVD) is a leading cause of preventable morbidity and mortality in Aboriginal and Torres Strait Islander peoples. This statement from the Australian Chronic Disease Prevention Alliance, the Royal Australian College of General Practitioners, the National Aboriginal Community Controlled Health Organisation and the Editorial Committee for Remote Primary Health Care Manuals communicates the latest consensus advice of guideline developers, aligning recommendations on the age to commence Aboriginal and Torres Strait Islander CVD risk assessment across three guidelines.

Main recommendations: In Aboriginal and Torres Strait Islander peoples without existing CVD:

- CVD risk factor screening should commence from the age of 18 years at the latest, including for blood glucose level or glycated haemoglobin, estimated glomerular filtration rate, serum lipids, urine albumin to creatinine ratio, and other risk factors such as blood pressure, history of familial hypercholesterolaemia, and smoking status.
- Individuals aged 18–29 years with the following clinical conditions are automatically conferred high CVD risk:
  - type 2 diabetes and microalbuminuria;
  - moderate to severe chronic kidney disease;
  - systolic blood pressure ≥ 180 mmHg or diastolic blood pressure ≥ 110 mmHg;
  - familial hypercholesterolaemia; or
  - serum total cholesterol > 7.5 mmol/L.
- Assessment using the National Vascular Disease Prevention Alliance absolute CVD risk algorithm should commence from the age of 30 years at the latest — consider upward adjustment of calculated CVD risk score, accounting for local guideline use, risk factor and CVD epidemiology, and clinical discretion.
- Assessment should occur as part of an annual health check or opportunistically. Subsequent review should be conducted according to level of risk.

Changes in management as a result of this statement: From age 18 years (at the latest), Aboriginal and Torres Strait Islander adults should undergo CVD risk factor screening, and from age 30 years (at the latest), they should undergo absolute CVD risk assessment using the NVDPA risk algorithm.

Cardiovascular disease (CVD) is the largest contributor to preventable morbidity and mortality in Aboriginal and Torres Strait Islander peoples.[1] Although age-standardised CVD mortality has fallen by 40% over the past few decades, CVD still accounts for a quarter of Aboriginal and Torres Strait Islander deaths overall and 21% of all premature years of life lost.[1] CVD events and CVD-related mortality in the Aboriginal and Torres Strait Islander population occur, on average, about 10–20 years earlier than in non-Indigenous Australians.[2]

Australian and international guidelines for best practice CVD prevention recommend using an absolute risk approach to CVD risk assessment.[3–7] The approach combines information from multiple risk factors to assess an individual's overall risk of having a CVD event at a given time. In Australia, absolute CVD risk is calculated using the National Vascular Disease Prevention Alliance (NVDPA) absolute risk algorithm, applied to individuals without a history of CVD. It first assesses for the following clinical conditions:

- type 2 diabetes and age greater than 60 years;
- type 2 diabetes and microalbuminuria (defined as albumin excretion rate > 20 μg/min or urinary albumin to creatinine ratio [ACR] > 2.5 mg/mmol for males and > 3.5 mg/mmol for females);
- moderate to severe chronic kidney disease (CKD) (defined as persistently having a urine ACR > 25 mg/mmol for males or > 35 mg/mmol for females, or estimated glomerular filtration rate [eGFR] < 45 mL/min/1.73m^2)
- systolic blood pressure of 180 mmHg or greater or diastolic blood pressure of 110 mmHg or greater;
- previous diagnosis of familial hypercholesterolaemia;[8] or
- serum total cholesterol greater than 7.5 mmol/L.

Individuals with any of the above are automatically considered to be at high absolute risk of a future CVD event. People with an established diagnosis of CVD have the highest risk of a future event and should be managed according to the appropriate treatment guidelines.

For people without existing CVD or clinically determined high risk, the Framingham risk equation (FRE) is then used to calculate their risk of a primary CVD event in the next 5 years.[9] In Australia, risk is classified as low (< 10%), moderate (10–15%), high (> 15%), and clinically determined high risk.[6] This categorisation guides subsequent management in terms of provision of advice about protective and risk factors, commencement of blood pressure- and lipid-lowering therapy and review intervals.[6] This multiple risk factors approach is considered cost effective and minimises under- and overtreatment compared with single risk factor approaches.[10]

Recent studies using representative national data demonstrate high levels of undertreatment according to absolute CVD risk across the entire Australian population.[11,12] In the Aboriginal

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and Torres Strait Islander population aged 35–74 years, 42.2% of people at high absolute CVD risk (without prior CVD) are using lipid-lowering therapy.[12] Inconsistency in clinical practice guidelines is one likely barrier to uptake of an absolute CVD risk approach.[13]

There are three guidelines in common use that inform Aboriginal and Torres Strait Islander absolute CVD risk assessment and management: the NVDPA *Guidelines for the management of absolute cardiovascular disease risk*,[6] the Remote Primary Health Care Manuals (RPHCM) incorporating the Central Australian Rural Practitioners Association *Standard treatment manual*,[14] and the *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people* from the National Aboriginal Community Controlled Health Organisation (NACCHO) and the Royal Australian College of General Practitioners (RACGP).[15]

Although there is considerable alignment between the guidelines, including that all use the NVDPA absolute risk algorithm, there are key differences in some recommendations, particularly in relation to the age of commencement of absolute CVD risk assessment in Aboriginal and Torres Strait Islander peoples (Box 1).

In addition, there are differing recommendations for screening for individual CVD risk factors (Box 1). RPHCM recommends assessing multiple CVD risk factors from age 15–19 years as part of an adult health check.[14] The RACGP and NACCHO guidelines[15] recommend assessing multiple CVD risk factors from age 18–29 years. Aside from the different ages, recommendations differ from RPHCM through assessing for socioeconomic risk factors and family history of premature CVD and only assessing cholesterol and CKD among individuals aged 18–29 years with vascular risk factors (ie, family history of premature cardiovascular disease, CKD, overweight or obesity, smoking, diabetes, and/or elevated blood pressure[15]). The NVDPA guidelines[6] contain no advice on screening for any of these risk factors in Aboriginal and Torres Strait Islander peoples below age 35 years.

When these guidelines were developed, there was little empirical evidence to guide recommendations specific to absolute CVD risk in Aboriginal and Torres Strait Islander peoples.[13] Evidence has since emerged to support lowering the age at which to commence CVD risk assessment in Aboriginal and Torres Strait Islander adults.[12] As guidelines are currently between updates, there is a demonstrable need for agreement on a consistent age to begin CVD risk assessment in the Aboriginal and Torres Strait Islander population.

This statement communicates the consensus advice of the organisations responsible for the current guidelines — the Australian Chronic Disease Prevention Alliance (incorporating NVDPA), the RACGP, NACCHO and the Editorial Committee for RPHCM — on the age to commence assessment of CVD risk for Aboriginal and Torres Strait Islander peoples. It outlines the methods used for the development of the consensus statement, the main changes to recommendations for CVD screening in individuals without prior CVD, and the evidence base informing the recommendations.

Methods

The consensus development process began with a formal review of evidence for the alignment of guidelines on Aboriginal and Torres Strait Islander absolute CVD risk, and included evidence on points of concordance and divergence between guidelines.[13] The review also included a systematic review of literature related to Aboriginal and Torres Strait Islander or Māori absolute CVD risk assessment or management published since 2012.

The findings from this review were discussed at a stakeholder roundtable in February 2018. Representatives of the Aboriginal Community Controlled Health Sector, RACGP, RPHCM, NVDPA, the Australian Government Department of Health and Aboriginal and Torres Strait Islander research leaders attended. There was consensus that the age to start screening should be

1 Changes to guideline recommendations on the age to commence screening for cardiovascular disease (CVD) risk in Aboriginal and Torres Strait Islander peoples without known history of CVD

Guideline	Existing recommendations	Change to assessment
National Vascular Disease Prevention Alliance's *Guidelines for the management of absolute cardiovascular disease risk*[6]	No recommendations regarding assessment of CVD risk factors below age 35 years	Assess blood pressure, HbA_{1c} or BGL (random/fasting), serum lipids and screen for CKD from age 18–29 years to identify clinically determined high risk
	Assess risk using absolute CVD risk algorithm from age 35–74 years	Assess using full absolute CVD risk algorithm from age 30 years
National Aboriginal Community Controlled Health Organisation's and the Royal Australian College of General Practitioners' *National guide to a preventive health assessment for Aboriginal and Torres Strait Islander people*[15]	Assess blood pressure, HbA_{1c} or BGL (random/fasting) from age 18–29 years	No change
	Assess serum lipids and screen for CKD from age 18–29 years if vascular risk factors are present	Assess serum lipids and screen for CKD in all individuals aged 18–29 years
	Assess risk using absolute CVD risk algorithm from age 30 years. Consider adding 5% to calculated absolute risk score, according to clinical judgement	No change
Remote Primary Health Care Manuals Central Australian Rural Practitioners Association's *Standard treatment manual* (7th ed)[14] and *Clinical procedures manual* (4th ed)[16]	Assess blood pressure, HbA_{1c} or BGL (random/fasting) and serum lipids and screen for CKD from age 15–19 years	No change
	Assess risk using absolute CVD risk approach from age 20 years. Upwards risk adjustment of 5% to calculated risk automatically applied	No change

BGL = blood glucose level; CKD = chronic kidney disease; HbA_{1c} = glycated haemoglobin. ◆

younger than 35 years, and should be around ages 18–20 years, with an action item to convene a smaller working group with members of NVDPA, RPHCM, RACGP and NACCHO regarding guideline alignment.

Lowering the screening age was also discussed with the Australian National University's Aboriginal Reference Group for Cardiovascular Health. Members of the group are Aboriginal people who have expertise in research, health service, community partnerships, and/or lived experience of CVD. This group supported earlier screening and emphasised the need to combat fatalism regarding early CVD in Aboriginal and Torres Strait Islander communities through improved and proactive prevention. The group also emphasised the limitations of focusing only on biomedical risk factors and ignoring the social and cultural determinants of health.

Following the Aboriginal Reference Group meeting, a working group including representatives of the guideline developers — RACGP, NACCHO, RPHCM and NVDPA (represented by the Heart Foundation's Chief Medical Officer) — was convened to consider changes to the age of screening commencement. NACCHO representatives submitted comments as they were unable to attend on the day of the meeting — other members met in person. This group discussed the evidence base for guideline revision. Attendees agreed to the development of this consensus statement and agreed the statement would be reviewed as part of the next full guidelines review.

Recommendations

Screening for CVD risk factors, including diabetes and CKD, should commence from 18 years of age at the latest in the Aboriginal and Torres Strait Islander population to identify individuals with clinical conditions conferring high risk of a primary CVD event. (GRADE:[17] good practice point [GPP]) (Box 2). The following should be assessed:

- blood glucose level (random/fasting) or glycated haemoglobin, eGFR, serum lipids (random/fasting);
- urine ACR; and
- other risk factors, such as smoking status, blood pressure and history of familial hypercholesterolaemia.

Individuals aged 18–29 years with the following clinical conditions are automatically conferred high CVD risk (GRADE: GPP):

- type 2 diabetes and microalbuminuria;
- moderate to severe CKD;
- systolic blood pressure of 180 mmHg or greater or diastolic blood pressure of 110 mmHg or greater;
- previous diagnosis of familial hypercholesterolaemia;[8] or
- serum total cholesterol greater than 7.5 mmol/L.

Individuals with a history of CVD should be managed according to relevant guidelines,[18–21] which include treatment with blood pressure- and lipid-lowering medication simultaneously (GRADE: 1A).

Management of CVD risk should include:

- commencement of treatment with blood pressure- and lipid-lowering medication simultaneously in individuals at high risk of CVD, unless contraindicated or clinically inappropriate (GRADE: 1A) — consider initiating treatment in people at moderate absolute CVD risk;[22,23]
- commencement of blood pressure-lowering medication for patients with blood pressure persistently measuring more than 160/100 mmHg[24] (GRADE: 1A).
- advice and support for smoking cessation, regardless of the patient's level of CVD risk[15] (GRADE: 1A);
- provision of sustained, frequent and specific advice about nutrition, physical activity and alcohol, with support and follow-up[6,15,16] (GRADE: 1B):
  - nutrition: recommend following the Dietary Approaches to Stop Hypertension (DASH) eating plan, a Mediterranean diet, or similar, according to latest evidence-based recommendations on dietary approaches to reducing CVD risk.[25–27] Consider referral to an accredited practising dietitian to assist in education and developing a tailored plan to address CVD risk through dietary changes;
  - physical activity: 2.5–5 hours of moderate intensity physical activity, or 1.2–2.5 hours of vigorous intensity physical activity, or an equivalent combination of moderate and vigorous activities, per week (any physical activity is better than none);[28] and

2 Grading of Recommendations Assessment, Development and Evaluation (GRADE) categories[17]

Quality of evidence		Interpretation of the evidence
A	High	We are very confident that the true effect lies close to that of the estimate of the effect. For this consensus statement, the evidence has come from study types such as one or more systematic reviews, or several randomised control trials of high quality
B	Moderate	We are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different. For this consensus statement, the evidence has come from study types such as one or more randomised control trials of high quality or several comparative studies with concurrent controls (eg, cohort studies)
C	Low	Our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the effect
D	Very low	We have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect
Strength of recommendation		
1	Strong	The desirable effects of intervention outweigh its undesirable effects
2	Conditional/weak	Desirable effects probably outweigh the undesirable effects but uncertainty exists
GPP	Good practice point	Supporting evidence is insufficient or of low quality; therefore, recommendation is based on consensus and expert opinion of Guidelines Working Group members

The GRADE rating provided reflects the evidence appraisal within the *National Guide to a Preventive Health Assessment for Aboriginal and Torres Strait Islander people* (National Aboriginal Community Controlled Health Organisation and Royal Australian College of General Practitioners).[15] ◆

- alcohol: apply limits from the current National Health and Medical Research Council Guidelines.[29]

Assessment including using the NVDPA absolute CVD risk algorithm should commence from 30 years of age at the latest in the Aboriginal and Torres Strait Islander population. Consider upwards adjustment of calculated absolute CVD risk score taking into account risk factor and CVD epidemiology, local guideline use, and clinical discretion[4] (RPHCM guidelines recommended adjusting upwards by 5%)[14,15] (GRADE: GPP).

Assessment should occur as part of an annual health check or opportunistically. Subsequent review should be done according to the level of CVD risk as per NVDPA guidelines (GRADE: GPP).

Changes in assessment from current guidelines as a result of this consensus statement are presented in Box 1.

Evidence base for recommended changes

Emerging evidence shows that high absolute CVD risk starts earlier in Aboriginal and Torres Strait Islander peoples compared with non-Indigenous Australians. For individuals aged 35–44 years, hospitalisation and mortality rates for CVD in Aboriginal and Torres Strait Islander peoples were three times and eight times as high as that for non-Indigenous people respectively.[2]

A 2018 study using nationally representative data from the 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey found that 1.1% of Aboriginal and Torres Strait Islander peoples aged 18–24 years (95% CI, 0.0–2.5%) and 4.7% Aboriginal and Torres Strait Islander peoples aged 25–34 years (95% CI, 2.0–7.5%) were at high absolute risk of having a primary CVD event in the next 5 years.[12] These findings support those previously reported in specific Aboriginal and Torres Strait Islander populations.[30,31] The proportion of people aged 25–34 years at high risk (4.7%)[12] is similar to that seen in non-Indigenous people aged 45–54 years (4.0%), the age from which absolute CVD risk assessment is recommended for this population under the current NVDPA guidelines.[6] All Aboriginal and Torres Strait Islander peoples aged 18–34 years who were at high absolute risk of a primary CVD event were so classified based on the clinical criteria from the NVDPA algorithm.[12] New analyses from the Australian Aboriginal and Torres Strait Islander Health Survey (unpublished data) show 77.0% of Aboriginal and Torres Strait Islander adults aged 18–29 years (95% CI, 69.2–84.8%) have one or more vascular risk factors — as outlined in the NACCHO/RACGP guidelines[15] — that prompt clinicians to undertake screening for all conditions associated with clinically determined high risk of CVD from age 18 years.

Taken together, these findings indicate the need to assess and manage risk at an earlier age in Aboriginal and Torres Strait Islander adults. According to the current risk assessment algorithm, Aboriginal and Torres Strait Islander adults aged 25–34 years have an absolute CVD risk similar to non-Indigenous Australians aged 45–54 years. It also highlights that over three-quarters of this population have at least one vascular risk factor that would prompt screening for all relevant CVD risk factors before the age of 30 years under existing RACGP/NACCHO guidelines, and that all individuals aged under 30 years deemed to be at high risk were classified based on clinical criteria not the FRE. This last finding is particularly important as it negates the need to use equations such as the FRE or similar, which are not validated for use in individuals younger than 30 years.[32]

While the existing evidence presents the case for lowering the age of commencing CVD risk assessment, it is currently not sufficient to ascertain exactly what age is most appropriate, and such decisions always need to be made with input from Aboriginal and Torres Strait Islander community members and leaders.

Optimising the approach to Aboriginal and Torres Strait Islander cardiovascular risk assessment

Social determinants of health

The greater an individual's socio-economic disadvantage, the worse their CVD health outcomes are likely to be.[33–37] Absolute CVD risk scores are likely to underestimate the true risk for socio-economically disadvantaged people.[38] This social gradient should be considered when approaching CVD risk assessment and management in Aboriginal and Torres Strait Islander peoples because of the ongoing socio-economic disadvantage caused by the continued legacy of colonisation in Australia. A fundamental cause of the persisting socio-economic and health disadvantages experienced by Aboriginal and Torres Strait Islander peoples is racism.[39] A high proportion of Aboriginal and Torres Strait Islander peoples report unfair treatment in the past 12 months based on race.[37]

Social and emotional wellbeing

In the general population, a greater proportion of people with high compared with lower levels of psychological distress are at high primary risk of a CVD event,[40] and psychological distress may be a barrier to making changes that would reduce CVD risk.[41] Thirty per cent of Aboriginal and Torres Strait Islander adults report high or very high levels of psychological distress, at rates almost three times that of the non-Indigenous population.[42] In addition, for Aboriginal and Torres Strait Islander youth aged 10–24 years, suicide and self-inflicted injury is the leading contributor to burden of disease.[43] Therefore, it is especially important to consider social and emotional wellbeing alongside CVD risk assessment in Aboriginal and Torres Strait Islander peoples aged under 30 years and to consider the impact of psychological distress when approaching management.

Risk score adjustment

Many Australian CVD risk calculators do not allow CVD risk assessment for people aged less than 35 years. Until these risk calculators are updated, when assessing absolute CVD risk in Aboriginal and Torres Strait Islander peoples aged 30–34 years, clinicians should enter an age of 35 years. Studies comparing predicted and observed numbers of CVD events in remote Aboriginal and Torres Strait Islander populations have shown that FRE underestimates the risk of CVD events in people aged less than 35 years.[44,45] Therefore, the use of a slightly older age in these situations is unlikely to significantly inflate CVD risk.

While studies in remote communities have shown that, applied alone, FRE underestimates the risk of CVD events,[44,45] these findings may not apply to all Aboriginal and Torres Strait Islander peoples. The findings from these communities are likely to reflect a clustering of non-FRE risk factors, including socio-economic disadvantage, rather than an inherent underestimation of CVD risk due to race. A comprehensive assessment of CVD risk should involve the use of the appropriate risk prediction equation and include consideration of an individual's

clinical, psychological and socio-economic circumstances.[15] Upwards adjustment of calculated risk scores attempts to account for non-FRE risk factors and should be considered in the context of local risk factor and CVD prevalence.[15] Regions currently following RPHCM guidelines automatically apply a 5% upward adjustment to calculated absolute CVD risk scores based on local expert guidance.[14]

Adapting to emerging evidence

Data to inform absolute CVD risk assessment and management are increasing rapidly, particularly in relation to Aboriginal and Torres Strait Islander peoples.[46] Moving towards a living guidelines approach — where guideline recommendations are updated frequently as new evidence becomes available, rather than intermittent updating of the guidelines in full — for CVD risk assessment and management guidelines would facilitate timely update of clinical guidelines, allowing for more rapid implementation of the best available evidence to improve patient outcomes.[46] This statement should be refined as new evidence emerges, including any unintended consequences that may emerge from these recommendations, such as overdiagnosis and treatment.

Conclusion

The past two decades have seen large improvements in CVD mortality for Aboriginal and Torres Strait Islander peoples. A consistent approach to CVD risk assessment and management from an early age, and with consideration of non-FRE risk factors, will support further improvements in Aboriginal and Torres Strait Islander health.

Acknowledgements: This work was supported by a grant from the Australian Government Department of Health on improving cardiovascular disease prevention for Aboriginal and Torres Strait Islander peoples. The funding body had no role in the design of the consensus statement or in writing the statement. In addition to the co-authors of this article, the consensus statement was reviewed and endorsed by the RACGP's Aboriginal and Torres Strait Islander Health Council, the RACGP's Expert Committee — Quality Care, the Heart Foundation's Clinical Committee, the Heart Foundation's Heart Health Committee, the Editorial Committee for RPHCM and NACCHO.

Competing interests: No relevant disclosures.

Provenance: Not commissioned; externally peer reviewed. ■

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