Heart Foundation

Clinical factsheet:
The National Heart Foundation of Australia Position Statement on coronary artery calcium scoring for the primary prevention of cardiovascular disease in Australia.

These recommendations for the use of coronary artery calcium scoring are conditional[1].

Following absolute cardiovascular disease risk assessment[2], only consider coronary artery calcium scoring to reclassify risk for selected patients with **moderate or low risk**.

Absolute cardiovascular disease risk assessment:

Absolute cardiovascular disease risk assessment is recommended for people aged 45 years and over[2] (or 30 years and over for Aboriginal and Torres Strait Islander peoples[3]).

Coronary artery calcium scoring is **not necessary** in people already determined to be at **high absolute cardiovascular disease risk** (Box 1), for the purpose of reclassifying risk, as the results are unlikely to change management.

Box.1 Patients clinically determined to be at high risk of cardiovascular disease[2].

- Diabetes and age > 60 years
- Diabetes with microalbuminuria
- Moderate or severe chronic kidney disease
- Previous diagnosis of familial hypercholesterolaemia
- Systolic blood pressure ≥ 180 mmHg or diastolic blood pressure ≥ 110 mmHg
- Serum total cholesterol > 7.5 mmol/L

Main Recommendations[1]:

Coronary artery calcium scoring could be considered for:

1 Selected people classified as **moderate absolute cardiovascular disease risk** AND for whom the findings are likely to influence the intensity of risk management.

GRADE Evidence certainty: *Low.* GRADE Recommendation strength: *Conditional.*

2 Selected people classified with **low absolute cardiovascular disease risk**, AND who have additional risk-enhancing factors that may result in the underestimation of risk.

GRADE Evidence certainty: *Low*. GRADE Recommendation strength: *Conditional*.

- The absolute cardiovascular disease risk assessment algorithm recommended in the 2012 guidelines[2] may underestimate risk in certain populations, such as Aboriginal and Torres Strait Islander peoples[4], or in others with known risk-enhancing factors not fully captured in the algorithm (Box 2).

Box 2. Selected cardiovascular disease 'risk-enhancing' factors from US guidelines [5-6].

- Family history of premature atherosclerotic CVD
- Primary hypercholesterolaemia LDL ≥ 4.1 mmol/L, non-HDL ≥ 4.9 mmol/L
- Persistently elevated triglycerides > 1.98 mmol/L
- Metabolic syndrome
- History of premature menopause
- History of pregnancy-associated conditions that increase later atherosclerotic CVD risk e.g. preeclampsia
- Chronic inflammatory conditions, e.g. rheumatoid arthritis
- High risk ethnicity, e.g. South Asian populations, Aboriginal and Torres Strait Islander peoples
- Other lipids/biomarkers associated with increased atherosclerotic CVD risk, if measured:
  - Elevated high-sensitivity C-reactive protein
  - Elevated lipoprotein (a)
  - Elevated apolipoprotein B
  - Reduced ankle-brachial index (<0.9)

LDL: low density lipoprotein; non-HDL: non high density lipoprotein

Implications of coronary artery calcium score results

If coronary artery calcium scoring is undertaken:

1. A score = 0 Agatston Units (AU) could reclassify a person to a **low absolute cardiovascular disease risk** status; with subsequent management to be informed by patient/clinician discussion and follow contemporary recommendations for low absolute cardiovascular disease risk.

   GRADE Evidence certainty: *Very Low*. GRADE Recommendation strength: *Conditional*.

   - Apply caution when reclassifying to a lower risk status in the presence of certain risk-enhancing factors. For example, Aboriginal and Torres Strait Islander peoples, smoking, diabetes, or a family history of cardiovascular disease[5-7].
   - A score of 0 does not rule out the presence of non-calcified plaque.

2. A score = 1 AU to 99 AU AND <75th percentile for age and sex (Table 1), reclassification of risk status is uncertain.

3. A score >99 AU OR ≥75th percentile for age and sex (Table 1) could reclassify a person to a **high absolute cardiovascular disease risk** status; with subsequent management to be informed by patient/clinician discussion and follow contemporary recommendations for high absolute cardiovascular disease risk.

   GRADE Evidence certainty: *Very Low*. GRADE Recommendation strength: *Conditional*.

   - This result could reclassify a person **indefinitely to high absolute cardiovascular disease risk** status. Repeat calcium scoring is not warranted in this group.

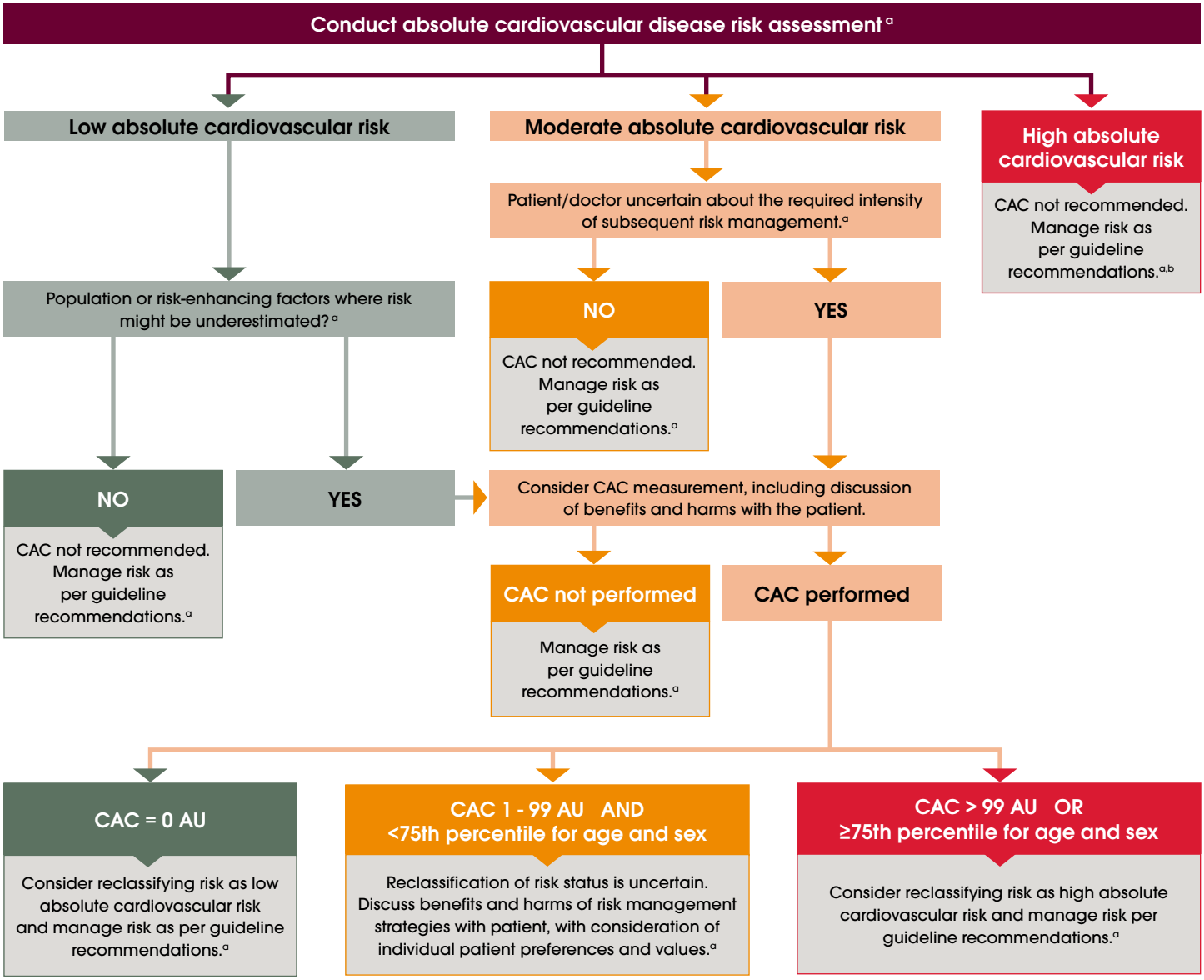
		Men				Women			
	Age (yr)	<45	45-54	55-64	65-74	<45	45-54	55-64	65-74
Percentile	25th	0	0	0	40	0	0	0	0
	50th	0	0	30	173	0	0	0	4
	75th	0	21	162	585	0	0	17	43
	90th	8	108	315	1230	0	1	91	212

Table 1: Normal distribution of coronary artery calcium scores (AU) in a healthy cohort stratified by age and sex, adapted from Hoffmann et al.[8] AU: Agatston units; yr: year.

At the time of publication, coronary artery calcium scoring is not publicly funded in Australia, and the cost lies with individual patients. Please consider the potential impact of cost of coronary artery calcium scoring on health equity using a shared decision-making approach that considers the patient's preferences and values.

Where an initial coronary artery calcium score = 0, or ranges from 1 AU to 99 AU AND <75th percentile for age and sex, an interval of five years is reasonable if considering a repeat coronary artery calcium score[9-10].

Figure. 1 Integrating conditional recommendations from the National Heart Foundation of Australia's Position Statement on coronary artery calcium scoring for the primary prevention of cardiovascular disease into practice.



Thresholds for coronary artery calcium scoring have been adapted from international guidelines.
a As assessed using the absolute cardiovascular disease risk calculator.
b For the purpose of reclassifying risk. The use of calcium scoring to detect subclinical atherosclerosis may be considered in patients with familial hypercholesterolaemia (FH) in line with guidance from FH Australasia Network[11].
AU: Agatston units; CAC: coronary artery calcium.

References

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