Quick reference guide for health professionals

Absolute cardiovascular disease **risk** assessment

This quick reference guide is a summary of the key steps involved in assessing absolute cardiovascular risk (otherwise known as heart and stroke risk). It is based on the National Vascular Disease Prevention Alliance's Guidelines for the assessment of absolute cardiovascular disease risk,* available at www.heartfoundation.org.au.

An initiative of the **National Vascular Disease Prevention Alliance**

Diabetes AUSTRALIA · KIDNEY HEALTH AUSTRALIA · Heart Foundation · strokefoundation

The NVDPA is a group of four leading and well-known Australian charities: Kidney Health Australia, Diabetes Australia, the National Heart Foundation of Australia and the National Stroke Foundation. It was established in 2000 and aims to reduce cardiovascular disease in Australia. Links to the full guidelines can be found on NVDPA member websites: www.strokefoundation.com.au, www.kidney.org.au, www.diabetesaustralia.com.au and www.heartfoundation.org.au.

Why use an absolute risk approach?

"**Cardiovascular absolute risk assessment** is a simple tool that can enhance your clinical judgement, and improve your ability to educate and motivate patients. Single risk factors (like cholesterol level) provide a poor estimate of a patient's CVD risk. Absolute risk assessment provides a more accurate estimate of overall, individualised CVD risk, thereby allowing the clinician to best tailor pharmaceutical and lifestyle management to the patient."

– **Professor Mark Harris**, Royal Australian College of General Practitioners, University of New South Wales

Comprehensive risk assessments, using an absolute risk approach, help GPs to effectively manage their patient's cardiovascular disease (CVD)* risk by providing a meaningful and 'individualised' risk level.

The absolute risk approach is emphasised by several Australian and international primary care guidelines, and recommended by experts.

The probability that an individual will develop CVD within a given period of time depends on the combination and intensity of all identified risk factors, rather than on the presence of any single risk factor. Using an absolute risk approach takes into account the cumulative and sometimes synergistic effects of these multiple risk factors.

Clinical decisions based on absolute CVD risk levels can lead to improved health outcomes, because they direct the right treatments to those who can benefit most.[1,2]

Your patient's absolute risk – what it means

Absolute risk is the **numerical probability** of an event occurring within a specified period, expressed as a percentage. For example, if your patient's risk is 15%, there is a 15% probability that they will experience a cardiovascular event within 5 years.
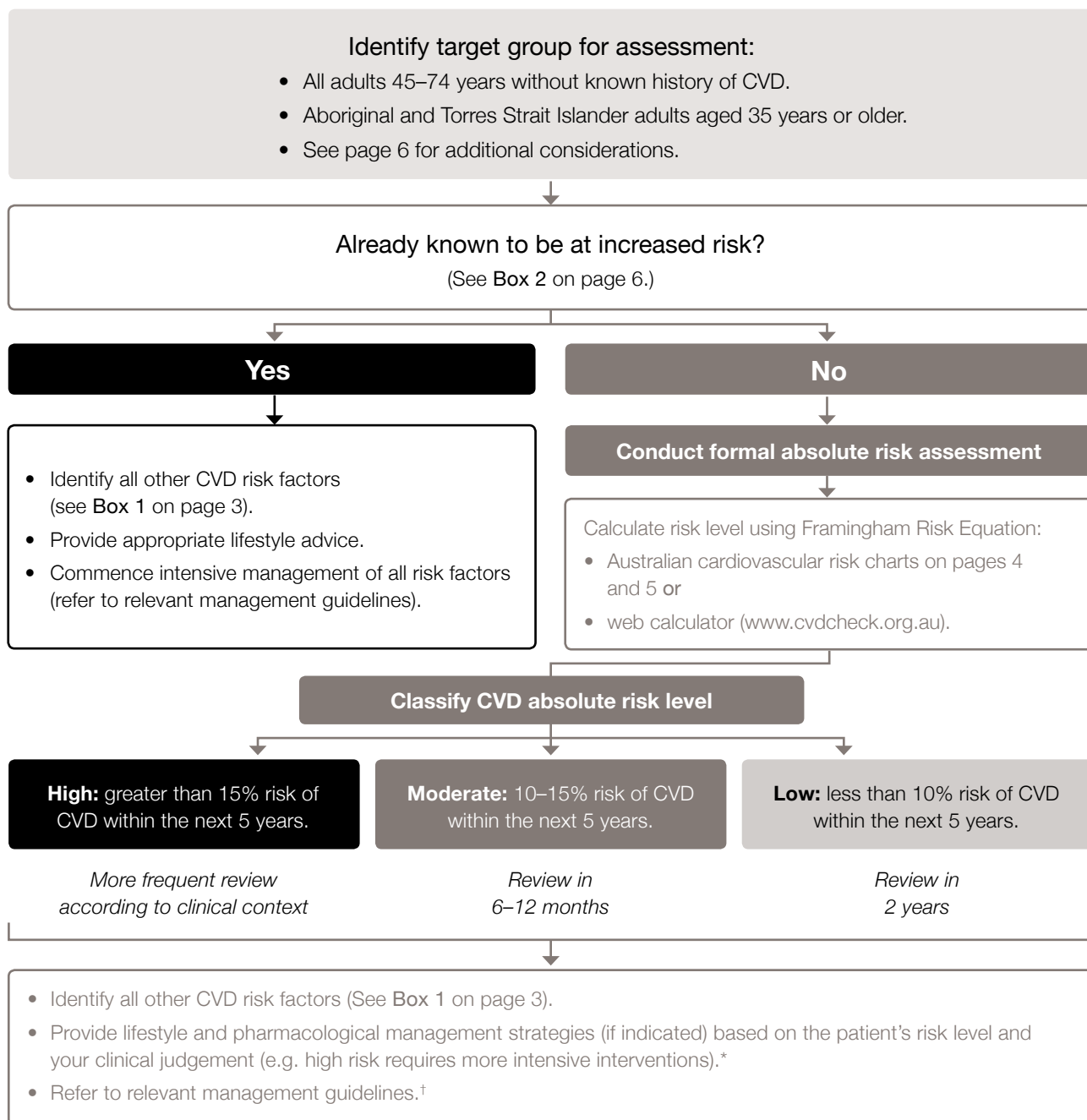
What about relative risk?

Relative risk is a ratio of the rate of events in the population exposed to a risk factor compared with the rate among the population not exposed to this risk factor. Relative risk tells you little about your patient's actual risk.

* CVD refers collectively to coronary heart disease, stroke and other vascular disease, including peripheral arterial disease and renovascular disease.

Assessment algorithm

Cardiovascular risk tools enhance your clinical judgement of a patient's absolute cardiovascular risk. Use the below algorithm and charts on pages 4 and 5 to calculate absolute risk.

Identify target group for assessment:

- All adults 45–74 years without known history of CVD.
- Aboriginal and Torres Strait Islander adults aged 35 years or older.
- See page 6 for additional considerations.

Already known to be at increased risk?
(See **Box 2** on page 6.)

Yes

- Identify all other CVD risk factors (see **Box 1** on page 3).
- Provide appropriate lifestyle advice.
- Commence intensive management of all risk factors (refer to relevant management guidelines).

No

Conduct formal absolute risk assessment

Calculate risk level using Framingham Risk Equation:
- Australian cardiovascular risk charts on pages 4 and 5 **or**
- web calculator (www.cvdcheck.org.au).

Classify CVD absolute risk level

High: greater than 15% risk of CVD within the next 5 years.	**Moderate:** 10–15% risk of CVD within the next 5 years.	**Low:** less than 10% risk of CVD within the next 5 years.
More frequent review according to clinical context	*Review in 6–12 months*	*Review in 2 years*

- Identify all other CVD risk factors (See **Box 1** on page 3).
- Provide lifestyle and pharmacological management strategies (if indicated) based on the patient's risk level and your clinical judgement (e.g. high risk requires more intensive interventions).*
- Refer to relevant management guidelines.†

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* If you would like to explain the concept of absolute risk to your patient, please refer to the consumer booklet *Know your heart and stroke risk* available at: **www.diabetesaustralia.com.au**, **www.kidney.org.au**, **www.strokefoundation.com.au** and **www.heartfoundation.org.au**.

† Management recommendations are currently available across separate guidelines. Useful websites include **www.diabetesaustralia.com.au**, **www.kidney.org.au**, **www.strokefoundation.com.au** and **www.heartfoundation.org.au**.

What is included in CVD risk assessment?

Absolute cardiovascular risk assessment will include an assessment of the factors outlined in **Box 1** below.

Box 1.

Modifiable risk parameters

- Smoking status*
- Blood pressure*
- Serum lipids*
- Waist circumference and body mass index
- Nutrition
- Physical activity level
- Alcohol intake[†]

Non-modifiable risk parameters

- Age* and sex*
- Family history of premature CVD
- Social history including cultural identity, ethnicity, socioeconomic status[‡] and mental health

Related conditions

- Diabetes
- Kidney function (microalbumin ± urine protein, estimate of glomerular filtration rate)
- Familial hypercholesterolaemia[§]
- Evidence of atrial fibrillation (history, examination, electrocardiogram)

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*   Risk parameters that are included in the absolute risk calculator, based on the Framingham Risk Equation.

†   Alcohol is a risk factor for elevated blood pressure (which is itself a major independent determinant of risk of atherosclerotic disease), stroke and cardiomyopathy. For a full discussion of this, please see the NHMRC's *Australian guidelines to reduce health risks from drinking alcohol*.

‡   Risk assessment requires consideration of **socioeconomic deprivation as an independent risk factor** for CVD. Absolute risk of CVD calculated using the Framingham Risk Equation is likely to underestimate cardiovascular risk in socioeconomically deprived groups.

§   Refer to National Heart Foundation of Australia's information sheet *Familial hypercholesterolaemia: information for doctors*.

References

1. Jackson R, Lawes CM, Bennett DA, et al. Treatment with drugs to lower blood pressure and blood cholesterol based on an individual's absolute cardiovascular risk. Lancet 2005; 365: 434-441.

2. Chen L, Rogers SL, Colagiuri S, et al on behalf of the National Vascular Disease Prevention Alliance. How do the Australian guidelines for lipid-lowering drugs perform in practice? Cardiovascular disease risk in the AusDiab Study, 1999–2000. MJA 2008; 189: 319–322.
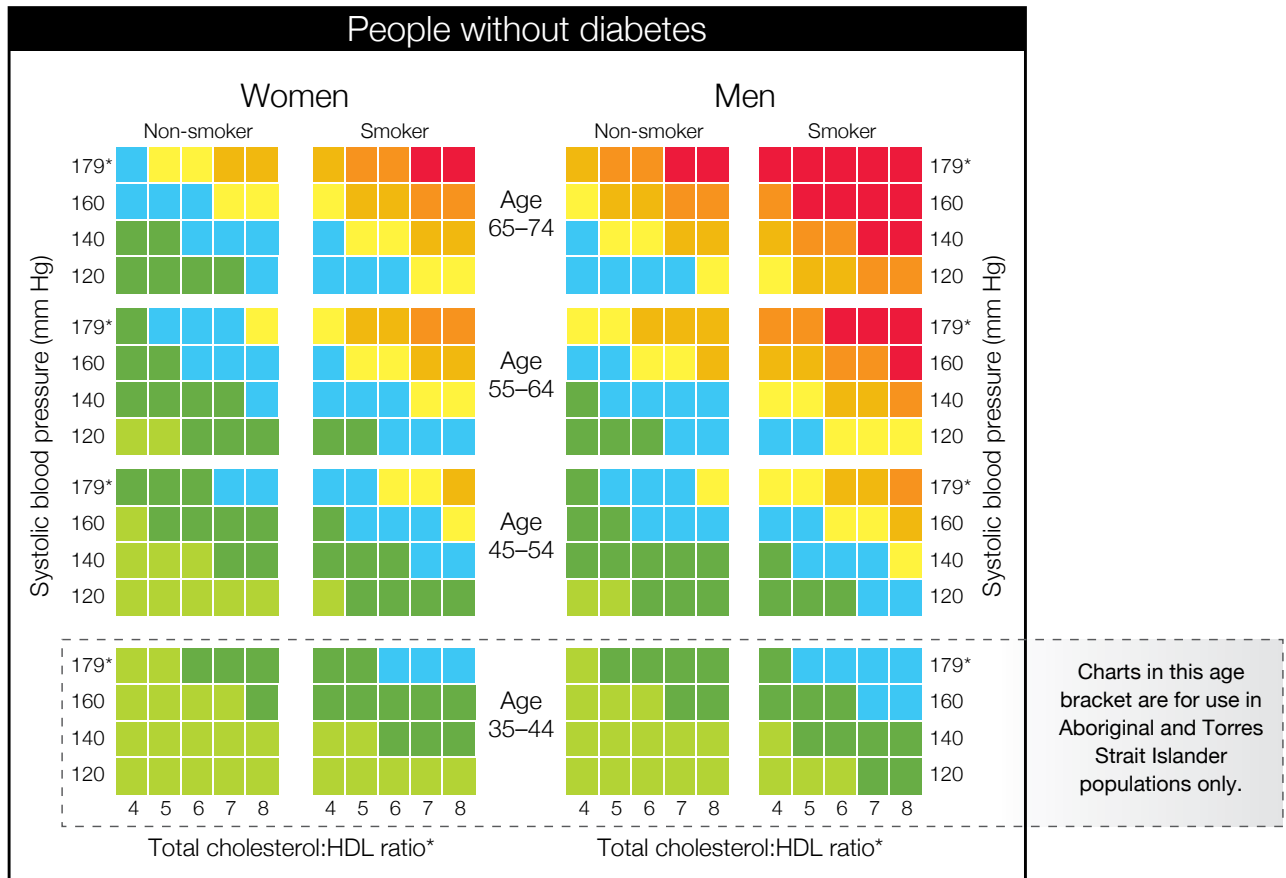
Australian cardiovascular **risk charts**

People without diabetes — risk chart grid showing Women and Men (Non-smoker and Smoker), across age groups 65–74, 55–64, 45–54, and 35–44, plotting Systolic blood pressure (mm Hg) against Total cholesterol:HDL ratio*.

Charts in this age bracket are for use in Aboriginal and Torres Strait Islander populations only.

* 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.
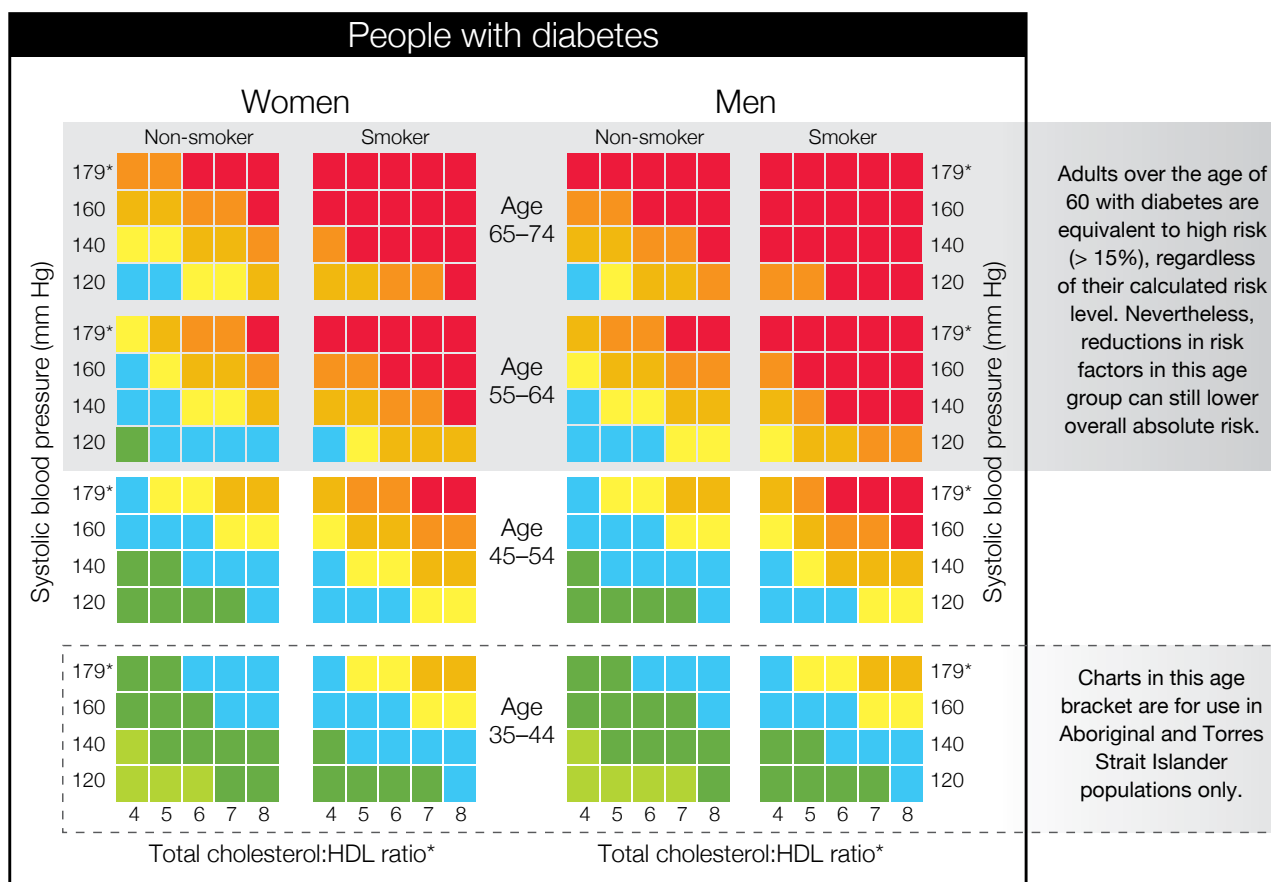
Risk level for 5-year cardiovascular (CVD) risk

High risk	Moderate risk	Low risk
≥ 30%	10–15%	5–9%
25–29%		< 5%
20–24%		
16–19%		

How to use the risk charts

1. Identify the chart relating to the person's sex, diabetes status, smoking history and age. The charts should be used for all adults aged 45–74 years (and all Aboriginal and Torres Strait Islander adults aged 35 years or 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.

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). People who fall exactly on a threshold between cells are placed in the cell indicating higher risk.

People with diabetes

Women   ## Men

Systolic blood pressure (mm Hg)

	Non-smoker	Smoker		Non-smoker	Smoker	
Age 65–74						
Age 55–64						
Age 45–54						
Age 35–44						

Total cholesterol:HDL ratio*

Adults over the age of 60 with diabetes are equivalent to high risk (> 15%), regardless of their calculated risk level. Nevertheless, reductions in risk factors in this age group can still lower overall absolute risk.

Charts in this age bracket are for use in Aboriginal and Torres Strait Islander populations only.

*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.

Risk level for 5-year cardiovascular (CVD) risk

High risk	Moderate risk	Low risk
≥ 30%	10–15 %	5–9%
25–29%		< 5%
20–24%		
16–19%		

Notes: The risk charts include values for SBP alone, as this is the most informative of conventionally measured blood pressure parameters for cardiovascular risk. For certain groups CVD risk may be underestimated using these charts; please see page 3 for recommendations to identify these groups.

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 NVDPA'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.nzgg.org.nz.

Who should have their absolute cardiovascular risk assessed?[*]

Adults aged 45-74 years without existing CVD or not already known to be at increased risk of CVD

Absolute cardiovascular risk assessment, using the Framingham Risk Equation to predict risk of a cardiovascular event over the next 5 years, should be performed for **all adults** aged **45–74 years** without existing CVD or not already known to be at increased risk of CVD (see **Box 2** below).

For specific population groups, additional recommendations include:

1. Commence assessment in **Aboriginal and Torres Strait Islander adults** at 35 years (rather than 45 years). Although the Framingham Risk Equation might underestimate risk in this population, available evidence suggests that this approach will provide an estimate of minimum cardiovascular risk.

2. Conduct assessments in **adults with diabetes** aged 45–60 years (rather than 45–74 years). Although the Framingham Risk Equation might underestimate risk in this population, available evidence suggests that this approach will provide an estimate of minimum cardiovascular risk.

3. In **adults who are overweight or obese**, the results of the assessment should be interpreted with the awareness that its predictive value has not been specifically assessed in this population.

4. In **adults with atrial fibrillation** (particularly those aged over 65 years), an increased risk of cardiovascular events and all-cause mortality, in addition to thromboembolic disease and stroke, should be taken into account. While CVD risk is known to be elevated for this population, it is not possible to quantify the degree of additional CVD risk in an individual.

Clinical judgement is necessary when assessing overall CVD risk.

Adults already known to be at increased risk of CVD

Adults with any of the conditions in Box 2 are **already known to be at increased absolute risk of CVD** and **do not** require further assessment using the Framingham Risk Equation.

For these groups, identifying all cardiovascular risk factors present will enable intensive management by lifestyle interventions (for all patients) and pharmacological interventions (where indicated).

[*] Some recommendations were derived from the systematic review, while others are consensus statements developed where the systematic literature review process was undertaken, but no evidence was found for or against the recommendation. For details see NVDPA's *Guidelines for the assessment of absolute cardiovascular disease risk*.

[†] Refer to National Heart Foundation of Australia's information sheet *Familial hypercholesterolaemia: information for doctors*.

Box 2.

- Diabetes and age > 60 years
- Diabetes with microalbuminuria (> 20 mcg/min or urinary albumin:creatinine ratio > 2.5 mg/mmol for males, > 3.5 mg/mmol for females)
- Moderate or severe chronic kidney disease (persistent proteinuria or estimated glomerular filtration rate < 45 mL/min/1.73 m^2)
- A previous diagnosis of familial hypercholesterolaemia[†]
- Systolic blood pressure ≥ 180 mmHg or diastolic blood pressure ≥ 110 mmHg
- Serum total cholesterol > 7.5 mmol/L