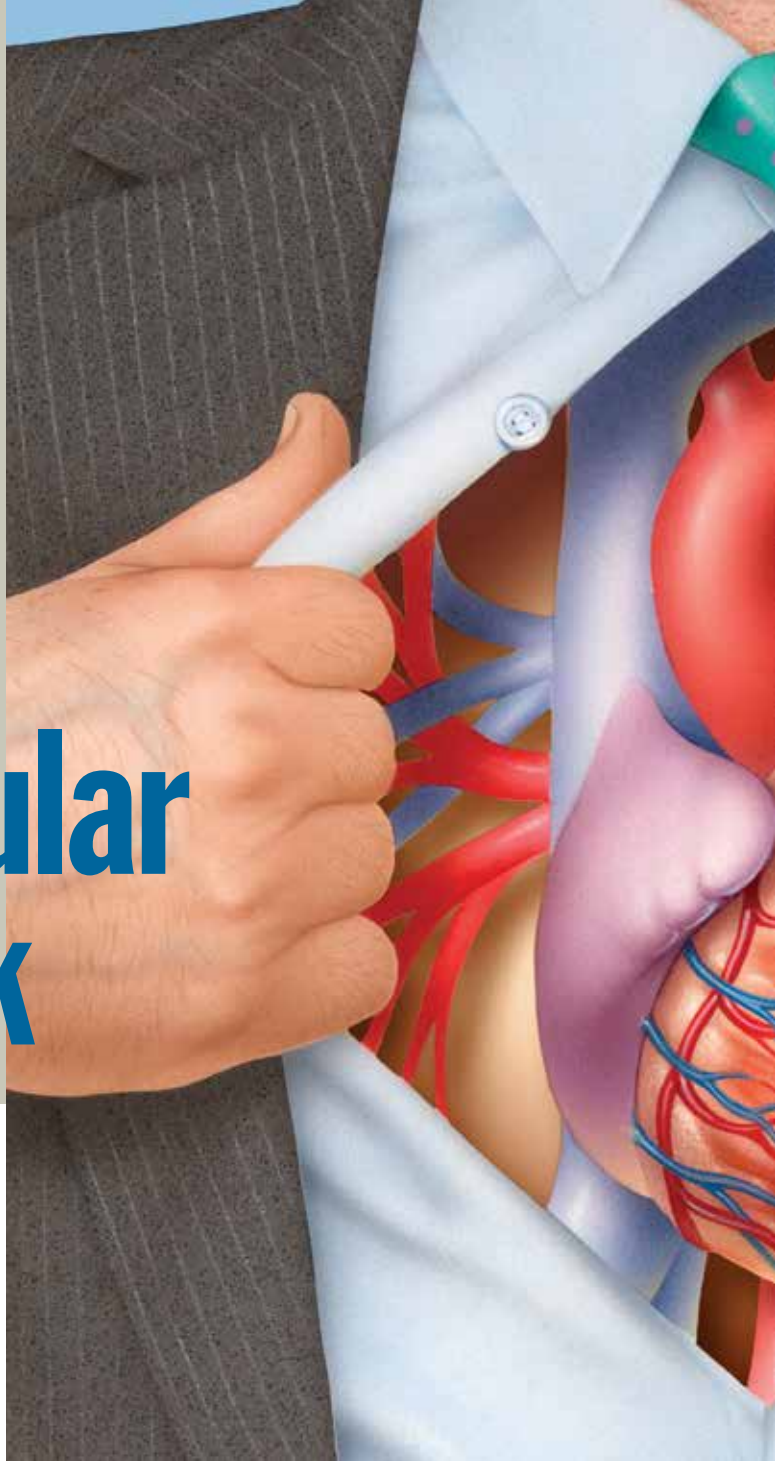
FEATURE

# Assessing and managing absolute cardiovascular disease risk



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*Absolute cardiovascular disease risk assessment and management provides GPs with a systematic method of using routine risk data to identify and manage patients who are at risk of a cardiovascular disease event and to use this information to improve patient outcomes.*

It is standard primary care practice to monitor blood pressure and lipid levels in adult patients. These investigations are often carried out as part of a routine check up that may also include other measures, such as a fasting blood glucose test or kidney function assessment. Once these data are collected it is usual practice to include the results in the patient's record and follow up with consultations and treatment as clinically indicated. Daily practices of primary care such as these are one of the sector's unsung contributions to preventing Australia's single biggest killer – cardiovascular disease (CVD).

With the introduction of the National Health and Medical Research Council approved *Guidelines for the Management of Absolute Cardiovascular Disease Risk* (Figure 1),[1] the role of general practitioners in CVD prevention has been strengthened. These guidelines can be downloaded in pdf format from http://strokefoundation.com.au/site/media/AbsoluteCVD_GL_webready.pdf or ordered through the National Heart Foundation's Heart Health information service (Tel. 1300 36 27 87). Absolute or 'total' CVD risk has been adopted in Europe, the USA and the UK in response to the weight of evidence that recognises that the sum total of multiple interacting risk factors is more accurate in predicting a

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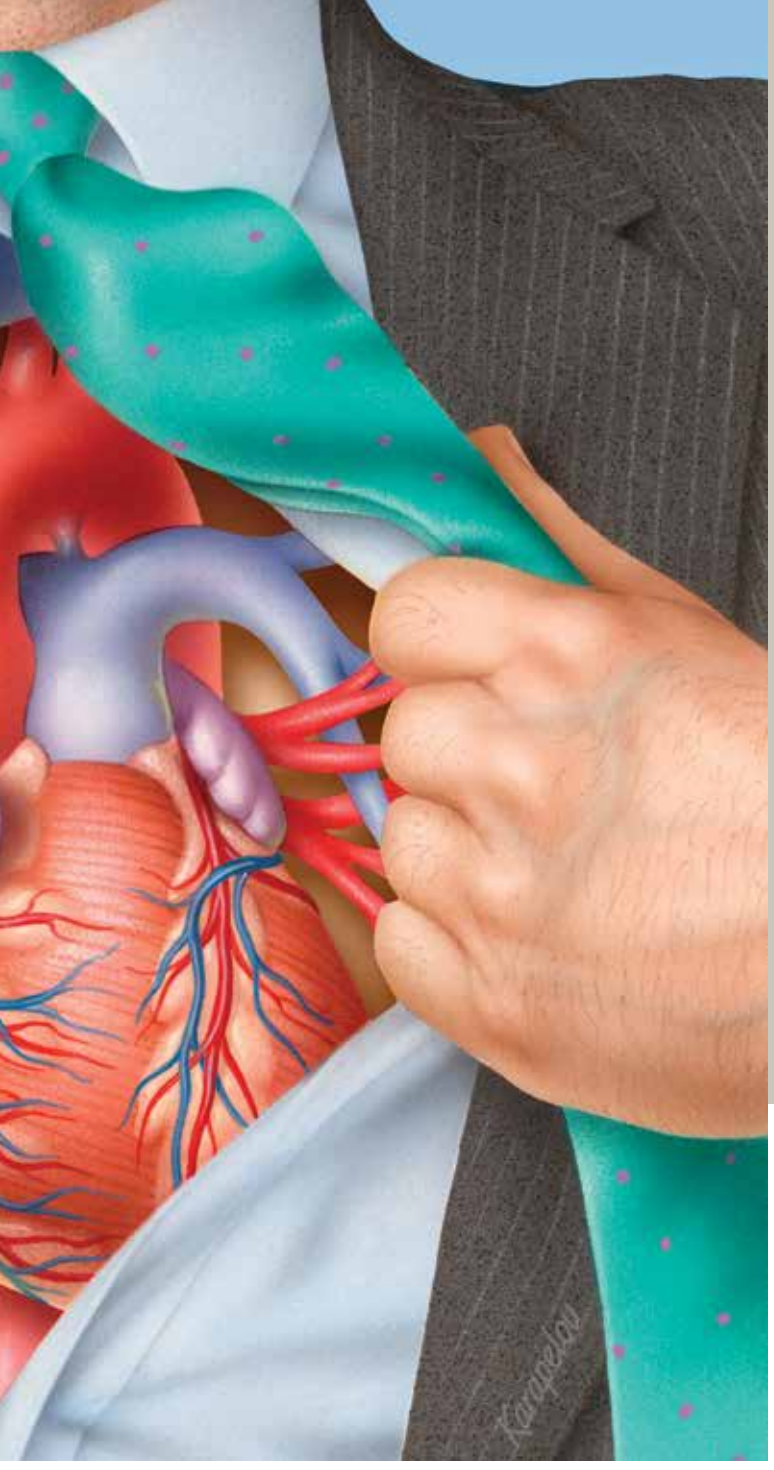


## Key points

- **Absolute cardiovascular disease risk has been broadly embraced across the developed world in recognition of clear evidence that individual risk factors coexist and interact to contribute to greater overall cardiovascular disease risk.**
- **Absolute cardiovascular disease risk offers a systematic approach to the primary prevention of cardiovascular disease in your patient populations**
- **The *Guidelines for the Management of Absolute Cardiovascular Disease Risk* (Figure 1) were approved by the National Health and Medical Research Council in 2012 and are written specifically for the primary care setting.**
- **Absolute cardiovascular disease risk assessment assists health professionals in targeting prevention efforts according to a patient's risk severity.**


Figure 1. Illustration of the cover of the *Guidelines for the Management of Absolute Cardiovascular Disease Risk*.

first CVD event than single risk factor approaches. Absolute CVD risk assessment puts routinely collected information to better use, providing deeper insight into a patient's overall CVD health and identifying which patients should receive the most intensive prevention efforts. This article provides an overview of absolute CVD risk management in general practice and its usefulness in stratifying risk across practice populations.

### A patient's story

*Peter, aged 66 years, was found unconscious on the floor of his beloved cricket club at 10.00 am on a Sunday morning. Despite attempts to resuscitate Peter, he was pronounced dead. A premortem of the years leading up to his death revealed that the myocardial infarction that killed Peter did not come unannounced but rather simply unrecognised. A year before Peter's death, he had reluctantly gone to his GP for a check up at the urging of his wife who had come to realise that Peter seldom considered his health a priority. When Peter saw his GP, his blood pressure was 135 mmHg (systolic). During this consultation, the GP gave Peter a pathology request for a fasting blood glucose measure and lipid profile. Peter's kidney function was not tested. The returned results showed nothing alarming. On his return visit, the GP explained to Peter that his total cholesterol level was 6 mmol/L, his HDL-cholesterol was 1.5 mmol/L, which was within the acceptable range, and his blood glucose levels were normal. Finishing the consultation, Peter, who was a smoker, promised his GP he was giving up smoking and had cut down to three cigarettes a day. Peter's risk factors were moderately elevated with the exception of smoking, which was the one risk factor that bothered the GP as potentially elevating Peter's risk of developing CVD.*

*Peter's risks when considered as a coherent risk profile – that is, accounting for his systolic blood pressure of 135 mmHg, his total cholesterol level of 6 mmol/L, his smoking status and his age – present a more concerning picture. If Peter's GP had entered Peter's risk factors into the absolute CVD risk calculator (available at www.cvdcheck.org.au), he would have found that Peter's absolute CVD risk score was 19% – representing a one in five chance of Peter experiencing a stroke or heart attack in a five-year window. According to the* Guidelines for the Management of Absolute Cardiovascular Disease Risk, *Peter was at high risk of a CVD event.*

**1. Patients already known to be at high risk of CVD**

Adults with any of the following conditions do not require absolute CVD risk assessment using the Framingham Risk Equation because they are already known to be at clinically determined high risk of CVD:

- existing CVD
- aged over 74 years and of Aboriginal or Torres Strait Islander decent
- diabetes and aged over 60 years
- diabetes with microalbuminuria (>20 µg/min or urinary albumin: creatinine ratio >2.5 mg/mmol for men or >3.5 mg/mmol for women)
- moderate to severe chronic kidney disease (persistent proteinuria or estimated glomerular filtration rate <45 mL/min/1.73m$^2$)
- a previous diagnosis of familial hypercholesterolaemia
- systolic blood pressure of 180 mmHg or diastolic blood pressure of 110 mmHg or above
- serum (fasting) total cholesterol level above 7.5 mmol/L.

## Absolute or total CVD risk adoption

The clinical application of absolute CVD risk has been made possible thanks to the juncture of a number of advances in methodology and epidemiological evidence over the past five to ten years. These factors, as set out by Lloyd-Jones,[2] include reliable disease incidence data, availability of disease risk markers, suitable statistical methods and availability of safe interventions. In a treatment context, absolute CVD risk offers a means of predicting the impact of coexisting and interacting risk factors.[2] Assessment of CVD disease risk on the basis of multiple risk factors has been shown to be more accurate than using single factors.[1]

## Primary prevention is now backed by Australian guidelines

The *Guidelines for the Management of Absolute Cardiovascular Disease Risk* were approved by the National Health and Medical Research Council in 2012 and apply to adults who have no existing CVD disease and are 45 years of age and over (or 35 years of age and over for Aboriginal and Torres Strait Islander people). They are the only current guidelines covering primary prevention of CVD in these populations.

## Applying the guidelines in practice

Absolute CVD risk assessment and management is a risk stratification process that illustrates who is most at risk in your clinic and where to focus the most intense prevention efforts. The process consists of collecting data about the patient, calculating an absolute CVD risk score and putting in place a management plan appropriate for the calculated risk category. As already highlighted, the measures needed to complete an absolute CVD risk assessment are often collected on a routine basis. For your existing patients, the information (in part or full) may already exist on the patient's file.

This process is enabled by a number of decision support tools, including treatment algorithms, risk charts and a downloadable calculator (available online at www.cvdcheck.org.au). The absolute CVD risk assessment and management process can be completed over a series of visits and is applicable to all eligible patients. The availability of practice software audit tools means practice managers or the technically inspired general practitioner can assess the overall risk profile of the practice population and identify gaps, including incomplete risk profiles and patients who are yet to be assessed. This information can then be used to inform patient follow up and for targeted prevention campaigns.

## Establishing a patient's risk profile

A patient's risk profile includes biometric measures required to calculate a risk score and additional risk factors necessary to support management decisions. The guidelines apply to adults aged 45 years and over without existing CVD (or aged 35 years and over for Aboriginal and Torres Strait Islander people). Patients with existing CVD are at immediate high risk of another event and should be managed in accordance with secondary prevention guidelines. Additional risk profiles that will classify a patient as immediate high risk are provided in Box 1.

In eligible patients, the following information is required to calculate a risk score:

- age
- sex
- smoking status
- systolic blood pressure
- total cholesterol level
- HDL-cholesterol level
- diabetes status (fasting blood glucose)
- kidney function (using urine albumin:creatinine ratio for albuminuria and a blood test for serum creatinine to establish glomerular filtration rate)
- ECG left ventricular hypertrophy (yes, no or unknown).

The following risk factors will influence treatment decisions and information on them should also be collected during routine patient history taking:

- waist circumference and body mass index
- family history of premature CVD
- certain ethnic backgrounds (due to higher risk burden in some populations)
- psychosocial factors, including depression, social isolation and socioeconomic status
- atrial fibrillation.

## Tools for calculating an absolute CVD risk score

### Online calculator or risk charts

Once the patient's risk profile is established, the downloadable calculator (available online at www.cvdcheck.org.au) or the CVD risk charts (available at www.heartfoundation.org.au/SiteCollectionDocuments/aust-cardiovascular-risk-charts.pdf) can be used to calculate his or her absolute CVD risk score.

The data needed to be obtained to use the online calculator are listed in Box 2. To calculate risk in patients over the age of 74 years, enter 74 into the calculator. Used in this manner, the calculator will underestimate risk in this age group and it is recommended that the score be used only as a baseline risk level in these patients. Aboriginal and Torres Strait Islander people over the age of 74 years are considered to be at immediate high risk (see Box 1).

The CVD risk charts use similar information to the risk calculator; however, in addition to the above the total cholesterol to HDL ratio will also need to be calculated (the calculator is calibrated to do this automatically). There are two charts – one for patients with diabetes and one for those without diabetes (Figure 2).

## Results

An absolute CVD risk assessment returns a percentage score, which represents the likelihood of a patient experiencing a heart attack in the next five years. The scores are broadly categorised as low, medium or high risk, as follows:

- low risk is less than 10%
- moderate risk is 10 to 15%
- high risk is greater than 15%.

## Underestimation of risk in some populations

The Framingham Risk Equation, which is the basis for the absolute CVD risk calculator and charts, may underestimate risk in the following groups:

- Aboriginal and Torres Strait Islander people
- adults with diabetes
- adults over the age of 74 years
- adults who are overweight or obese
- adults with kidney damage
- adults with reduced psychosocial health (factors include depression, social isolation and socioeconomic status)
- adults with atrial fibrillation.

## Targeting intensity of treatment

The guidelines provide algorithms to support decision making and treatment responses for each risk category (see flowchart on page 12); these should be used to underpin and support your own clinical judgement. Absolute CVD risk assessment is a risk stratification tool and the role of the clinician is to interpret and adjust the results based on clinical acumen and consideration of all contributing and related risk factors.

### 2. Data used in the absolute CVD risk calculator

To use the calculator (available at www.cvdcheck.org.au/) the following data need to be entered:

- sex (male or female)
- age (in years) between 34 and 74 years – if the patient is over 74 years of age, enter 74 into the calculator to establish a minimum risk level. If the patient is of Aboriginal and Torres Strait Islander descent and under the age of 45 years, enter age as 45.
- systolic blood pressure (mmHg)
- smoking status (yes or no)
- total cholesterol level (mmol/L)
- HDL-cholesterol level (mmol/L)
- diabetes (yes or no)
- ECG left ventricular hypertrophy (yes, no or unknown).

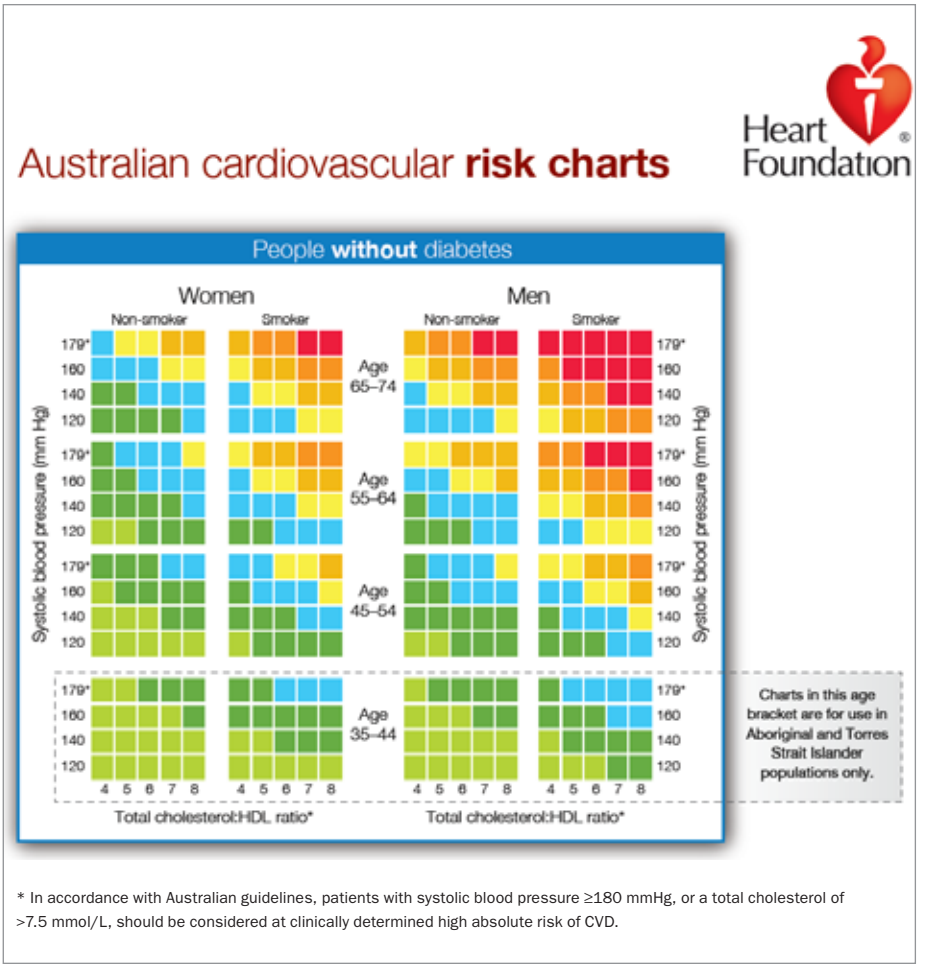
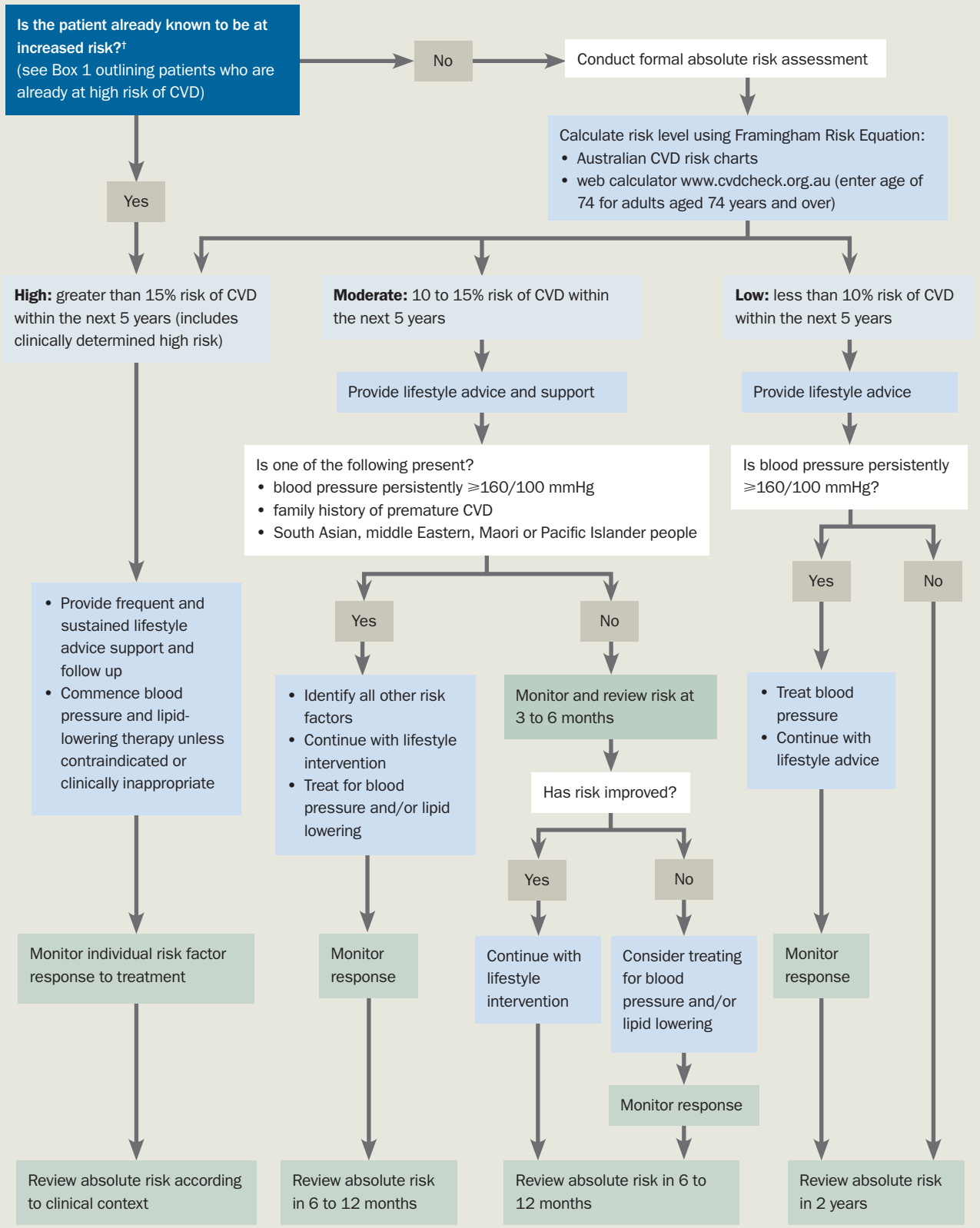



**Figure 2. Australian cardiovascular risk charts for people without diabetes.**
Reproduced with permission from the Heart Foundation of Australia.

**Risk assessment and management: adults aged 45 years and over without known history of CVD (not applicable to Aboriginal and Torres Strait Islander people*)**




* Please refer to page 104 of the guidelines for risk assessment and management algorithm for Aboriginal and Torres Strait Islander adults over 35 years of age without known history of CVD.[1] †Patients with existing CVD should be managed in accordance with secondary prevention guidelines.

**Table. Overview of management for people in different risk categories**

| CVD risk | Management |
|---|---|
| Low risk, less than 10% | In most cases, patients whose risk results place them in the lower risk categories will require minimum but regular follow up, accompanied by lifestyle advice. In some cases you may have to treat for elevated blood pressure in this risk category (if blood pressure persistently ⩾160/100 mmHg). |
| Moderate risk, 10 to 15% | The moderate- and high-risk categories should be the focus of prevention efforts. This includes more intensive lifestyle advice and where appropriate commencement of medication. In the event that a patient is classified as immediate high risk, the algorithm provided in the guidelines can be used to inform decisions regarding the initiation of risk-reducing medication. If patients have existing CVD, they should be treated in line with secondary prevention guidelines. |
| High risk, greater than 15% | |

**3. Support and information**

A number of organisations are supporting the implementation of absolute cardiovascular disease risk management. These include:

- **Royal Australian College of General Practitioners**
  www.racgp.org.au/your-practice/guidelines/redbook/prevention-of-vascular-and-metabolic-disease/assessment-of-absolute-cardiovascular-risk/
- **National Vascular Disease Prevention Alliance**
  www.cvdcheck.org.au/

## Management

Overview of the risk categories and associated management is outlined in the Table.

### Lifestyle advice and medication

Lifestyle advice is recommended for patients in each of the risk categories, either as the sole intervention or coupled with medication. Lifestyle advice is the primary intervention for patients in the low-risk category, in addition to any necessary treatment for elevated blood pressure (recommended for patients with systolic blood pressure of ≥160 mmHg). In the moderate-risk category, lifestyle advice remains the primary intervention. If additional risk factors are present or if lifestyle modification is not successful after three to six months, medication may be needed. In the high-risk groups, frequent and sustained lifestyle advice is recommended along with initiation of blood pressure and lipid-lowering therapies unless contraindicated or clinically inappropriate. Aspirin and other antiplatelet therapies are not routinely recommended for primary prevention of CVD.

Overall, the guidelines will better inform the GP about the targeting of medication for the purpose of preventing a first CVD event. In comparison, treatment informed by a single risk factor approach often results in unnecessarily prescribing medication to an individual who may be at low absolute CVD risk. In some instances, such as Peter's case, some patients will have an array of moderately raised risks, which, under a single risk-factor approach, would not trigger treatment. In Peter's case, this approach may have contributed to his death. The principle of absolute CVD risk reduction is the timely allocation of treatment to patients who are most likely to benefit.

### Treatment targets

The guidelines contain lipid and blood pressure treatment targets. Treatment targets set out in the guidelines may not be achievable for all individuals and clinical judgement is required to weigh up reaching a specific target and associated effects. The risks associated with the effort required to reach a particular target as opposed to achieving a near target value may outweigh any small absolute benefit. Any reduction in a risk factor will be associated with some benefit. Medication review intervals are also recommended in the guidelines.

## When to review absolute CVD risk

The frequency of reviews of CVD risk depends on the risk category of the individual patient and should be considered as separate to any medication review. In the low-risk category a review is recommended every two years. For patients in the moderate category, a review every six to 12 months is recommended. Review of patients in the high-risk category should be set according to clinical context. Importantly, absolute CVD risk assessment for patients who are taking treatment will underestimate the risk. The algorithm on page 12, which is an overview of risk assessment and management in adults over 45 years without known history of CVD, is for untreated populations.

## Conclusion

The *Guidelines for the Management of Absolute Cardiovascular Disease Risk* provide a powerful means of identifying and addressing CVD disease risk. Absolute CVD risk has been broadly embraced across the developed world in recognition of clear evidence that individual risk factors coexist and interact to contribute to greater overall CVD risk. Implementing the Australian guidelines in general practice will better inform CVD prevention efforts by concentrating treatment and management efforts on patients who are most likely to benefit and by reducing the number of people who are put on medication unnecessarily. **CT**

### References

1. National Vascular Disease Prevention Alliance. Guidelines for the management of absolute cardiovascular disease risk, 2012. Available online at: http://strokefoundation.com.au/site/media/AbsoluteCVD_GL_webready.pdf (accessed May 2014).
2. Lloyd-Jones DM. Cardiovascular risk prediction: basic concepts, current status and future directions. Circulation 2010; 121: 1768-1777.

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