BEST PRACTICE EVIDENCE-BASED GUIDELINE

THE ASSESSMENT AND MANAGEMENT OF CARDIOVASCULAR RISK

KEY MESSAGES

- Assessment of absolute cardiovascular risk is the starting point for all discussions with people who have cardiovascular risk factors measured. Reduction in cardiovascular risk is the goal of treatment.
- Risk assessment for most asymptomatic men is recommended from the age of 45 (or from the age of 35 if they have risk factors). Risk assessment for most asymptomatic women is recommended from the age of 55 (or from the age of 45 if they have risk factors).
- Māori should be assessed for cardiovascular risk 10 years earlier than non-Māori. There is an urgent need to focus intervention programmes on Māori, who bear the greatest burden of cardiovascular disease in New Zealand. The 'outcome gap' between Māori and non-Māori is widening.
- A fasting lipid profile, fasting plasma glucose and two blood pressure measurements are recommended investigations for comprehensive risk assessment.
- People with known cardiovascular disease and those at high risk because of diabetes with renal disease, or some genetic lipid disorders, are clinically defined at very high risk.
- Cardiovascular mortality is high in people with impaired glucose tolerance or diabetes and most will require intensive intervention. Particular attention is required for Māori who have a high rate of cardiovascular and renal complications from diabetes.
- Lifestyle change and drug intervention should be considered together. The intensity of intervention recommended depends on the level of cardiovascular risk:
  - a life free from cigarette smoke, eating a heart healthy diet and taking every opportunity to be physically active is recommended for people at less than 10% 5-year CV risk
  - lifestyle interventions for people at more than 10% 5-year CV risk are strongly recommended and this group should receive individualised advice using motivational interviewing techniques relating to smoking cessation if relevant, a cardioprotective diet and regular physical activity
  - cardiovascular risk should be reduced in people at greater than 15% 5-year CV risk by lifestyle interventions, aspirin, blood pressure lowering medication and lipid modifying therapy (statins). There should be a greater intensity of treatment for higher risk people (more than 20 – 30%)
  - after myocardial infarction, comprehensive programmes that promote lifestyle change for people are best delivered by a cardiac rehabilitation team. Most people with angina or after myocardial infarction will be taking at least four standard drugs, low-dose aspirin (75 – 150 mg), a beta-blocker, a statin and an ACE-inhibitor
  - virtually all ischaemic stroke and transient ischaemic attack survivors should be taking low dose aspirin, a combination of two blood pressure drugs and a statin.

ENDORSEMENTS

This guideline has received endorsement by the following organisations:

RCPA New Zealand Committee; The Royal Australasian College of Physicians New Zealand; The Cardiac Society of Australia and New Zealand; CRANZ; NZDA; Nurses Society of New Zealand; SPARC; The Australasian Faculty of Public Health Medicine – New Zealand

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EFFECTIVE ASSESSMENT AND MANAGEMENT OF CARDIOVASCULAR RISK

The Burden of Cardiovascular Disease

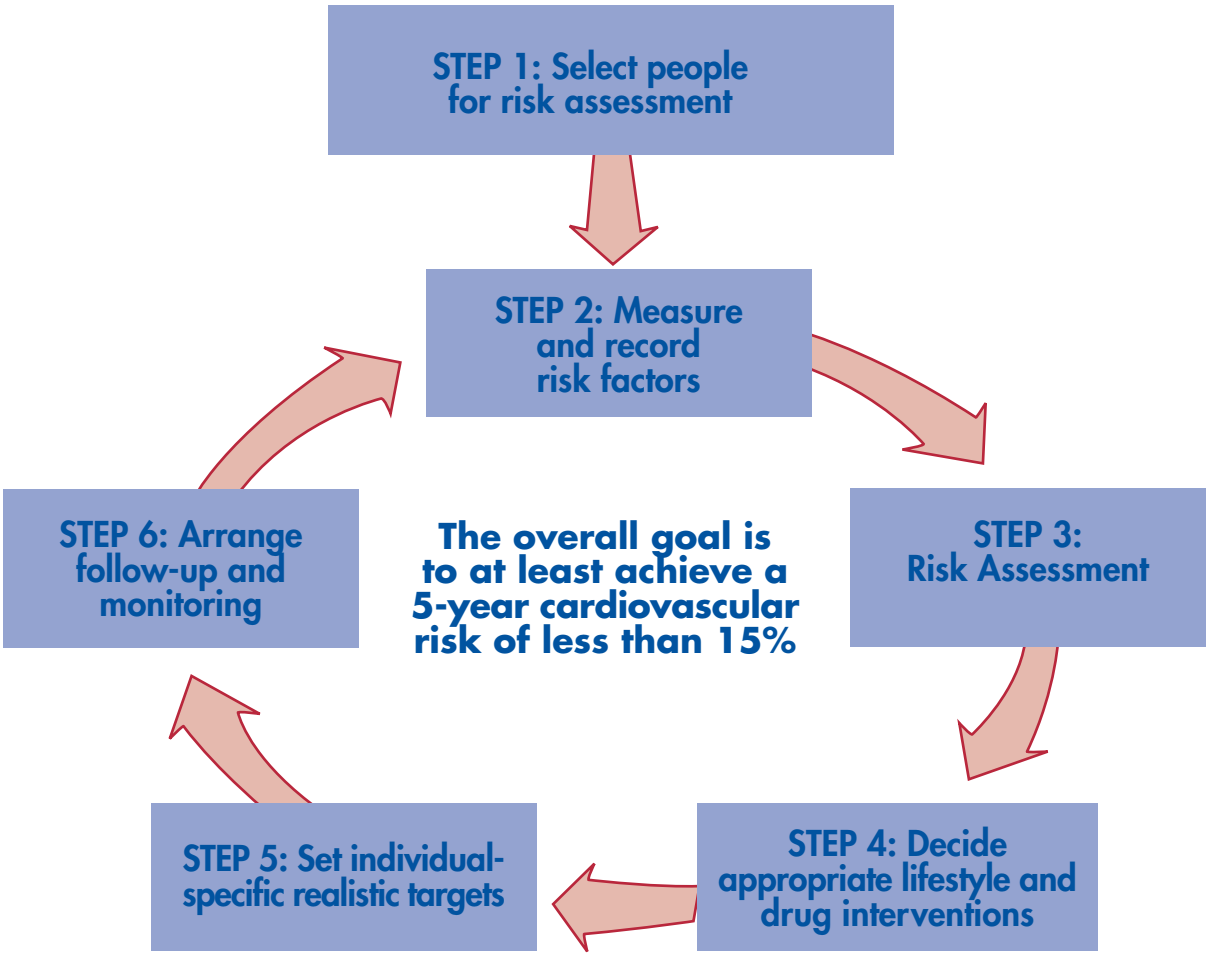
Cardiovascular disease is the leading cause of death in New Zealand, accounting for 40% of all deaths. While age-standardised mortality has halved over the past 30 years, the total number of deaths from cardiovascular disease has changed little because of the growing number of older people and at-risk individuals. The burden of cardiovascular disease falls disproportionately on Māori and also lower socioeconomic groups at a younger age. Cardiovascular disease can be reduced through lifestyle change and appropriate drug therapy.

Absolute Cardiovascular Risk

Treatment decisions are based on the likelihood an individual will have a cardiovascular event over a given period of time. This replaces decision-making based on individual risk factor levels. By knowing the risk level an individual and their practitioner can make decisions for prevention and treatment of cardiovascular disease, including lifestyle advice, diabetes care, the prescription of lipid-modifiying and blood pressure lowering medication and/or medication after myocardial infarction or ischaemic stroke.

The following steps outlined in Figure 1 explain the actions taken at each stage.

Figure 1: Steps in the assessment of cardiovascular risk



STEP 1: Select People for Risk Assessment

People with diabetes should have risk assessments from the time of diagnosis.

Table 1: Recommended age levels for initiating cardiovascular risk assessment

	Men	Women
Māori, Pacific peoples and people from the Indian subcontinent	Age 35 years	Age 45 years
People with known cardiovascular risk factors or at high risk of developing diabetes	Age 35 years	Age 45 years
Asymptomatic people, without known risk factors	Age 45 years	Age 55 years

STEP 2: Measure and Record Risk Factors

A comprehensive cardiovascular risk assessment includes measurement and recording of the following:

- age
- gender
- ethnicity
- smoking history
- a fasting lipid profile
- a fasting plasma glucose
- the average of two sitting blood pressures
- family history
- waist circumference
- body mass index.

People with diabetes will require additional tests:

- HbA1c
- albumin:creatinine ratio
- creatinine
- date of diagnosis.

The risk of myocardial infarction and ischaemic stroke increases before diagnostic levels of plasma glucose for diabetes are reached. People with IGT, impaired fasting glucose (IFG) or the metabolic syndrome need active intervention and careful follow-up.

STEP 3: Risk Assessment

5-year cardiovascular risk in the following groups is assumed clinically to be more than 20%:

- people who have had a previous cardiovascular event (angina, myocardial infarction, angioplasty, coronary artery bypass grafts, transient ischaemic attack, ischaemic stroke or peripheral vascular disease)
- people with some genetic lipid disorders (familial hypercholesterolaemia, familial defective ApoB and familial combined dyslipidaemia)
- people with diabetes and overt nephropathy (albumin:creatinine ratio ≥30 mg/mmol) or diabetes with other renal disease.

Cardiovascular risk in all other people can be calculated using the National Heart Foundation's cardiovascular risk tables (see Figure 2, *Assessing 5-year Cardiovascular Risk and Treatment Benefit*), or an electronic decision-support tool based on the Framingham risk equation for first cardiovascular events.

People with isolated elevated single risk factor levels will have at least greater than 15% CV risk over 5 years. They should have a risk assessment because, when all risk factors are taken into account, they may have a calculated 5-year CV risk higher than this.

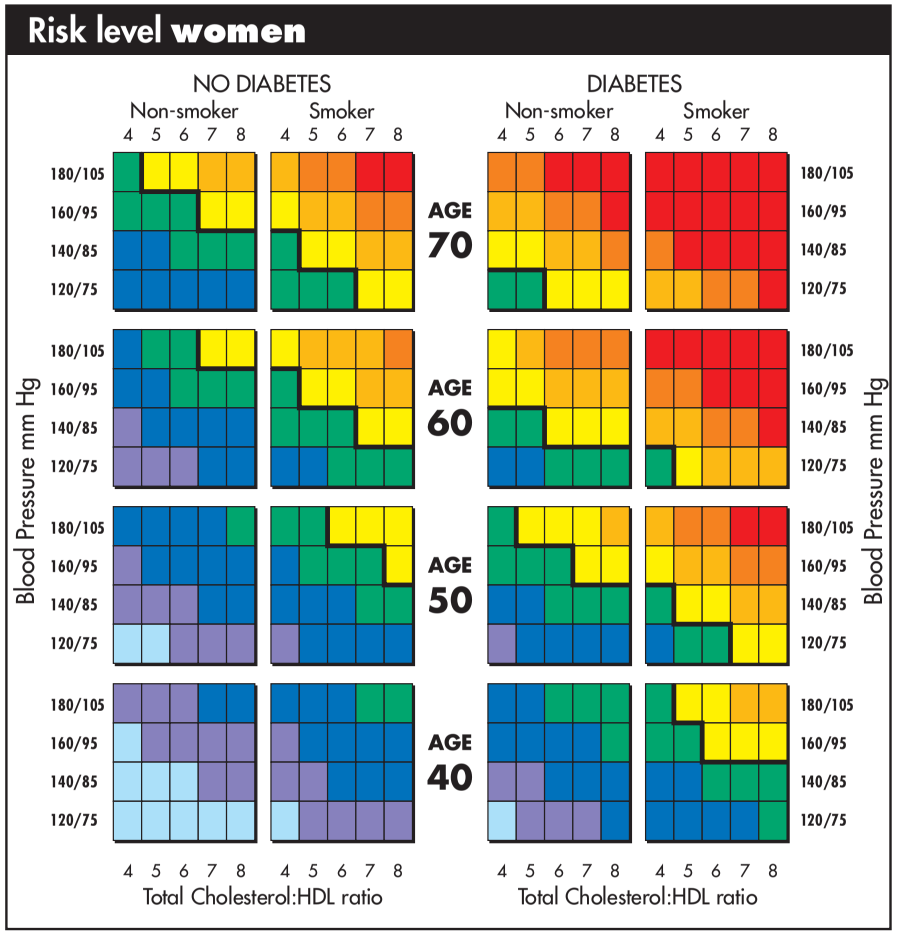
Isolated elevated single risk factor levels are defined as:

- TC greater than 8 mmol/L
- TC:HDL ratio greater than 8
- blood pressure consistently greater than 170/100 mm Hg.

Steps 4, 5 and 6: Interventions, Setting Treatment Targets and Follow-up

All treatment decisions should be based on an individual's 5-year absolute cardiovascular risk, and risk factor levels need interpretation in this context (see Figure 3 and Table 2).

ASSESSING CARDIOVASCULAR RISK AND TREATMENT BENEFIT



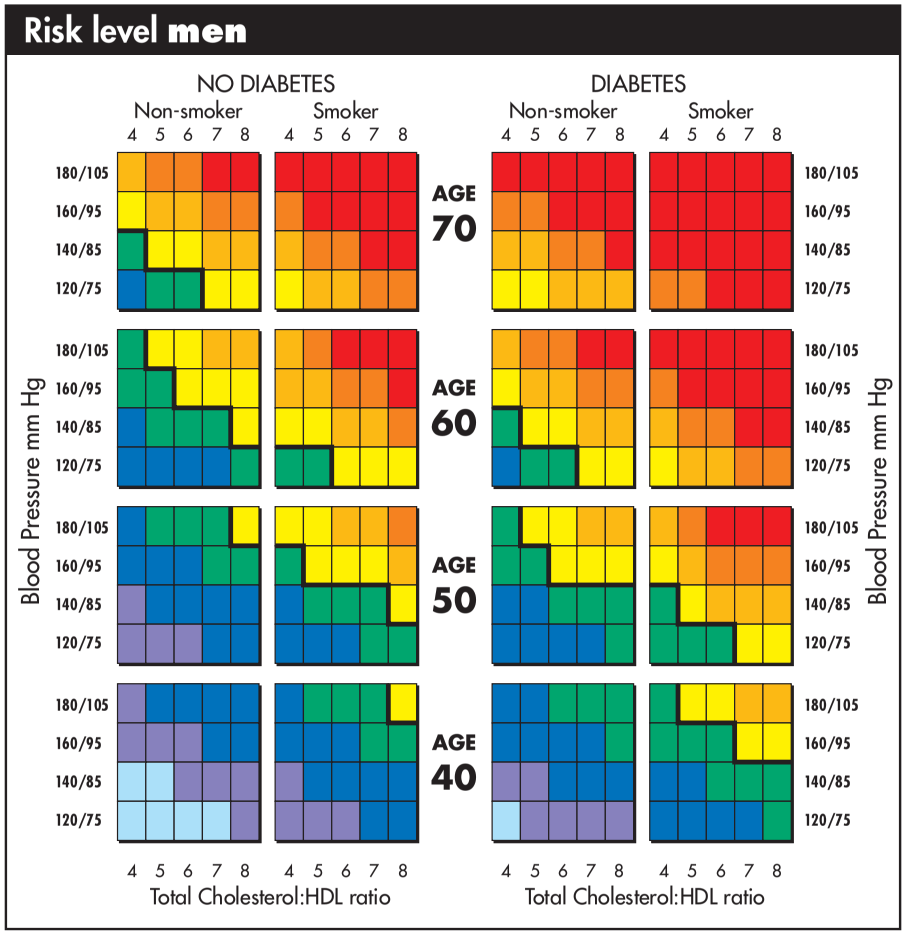


Figure 2: Assessing 5-year cardiovascular risk and treatment benefit

Risk Level
5 year CVD risk (non-fatal and fatal)

Very High	>30%	High	15–20%	Mild	5–10%
	25–30%	Moderate	10–15%		2.5–5%
	20–25%				<2.5%

How to use the Tables

- Identify the table relating to the person's sex, diabetic status, smoking history and age.
- Within the table choose the cell nearest to the person's age, blood pressure and TC:HDL ratio. When the systolic and diastolic values fall in different risk levels, the higher category applies.
- For example, the lower left cell contains all non-smokers without diabetes who are less than 45 years and have a TC:HDL ratio less than 4.5 and a blood pressure less than 130/80 mm Hg. People who fall exactly on a threshold between cells are placed in the cell indicating higher risk.

Heart Foundation
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Notes for Figure 2

People at very high risk (>20% over 5 years) determined clinically

- People who have had a previous cardiovascular event (angina, myocardial infarction, angioplasty, coronary artery bypass grafts, transient ischaemic attack, ischaemic stroke or peripheral vascular disease).
- People with genetic lipid disorders (familial hypercholesterolaemia, familial defective ApoB and familial combined dyslipidaemia).
- People with diabetes and overt nephropathy (albumin:creatinine ratio >30 mg/mmol) or diabetes and other renal disease.

Where CV risk is determined using the Framingham risk equation and tables

The following groups should be moved up one risk category (5%), as their cardiovascular risk may be underestimated in the Framingham risk equation:

- people with a family history of premature coronary heart disease or ischaemic stroke in a first-degree male relative before the age of 55 years or a first-degree female relative before the age of 65 years
- Māori
- Pacific peoples or people from the Indian subcontinent
- people with both diabetes and microalbuminuria
- people who have had type 2 diabetes for more than 10 years or who have an HbA1c consistently greater than 8%
- people with the metabolic syndrome.

These adjustments should be made once only for people who have more than one criteria (the maximum adjustment is 5%).

Where risk factor levels are extreme

- If blood pressure is consistently greater than 170/100 mm Hg or total cholesterol greater than 8 mmol/L or TC:HDL ratio greater than 8 the person is classified at least at high risk (>15%) and should receive specific lifestyle advice and medication to lower their risk, irrespective of their calculated cardiovascular risk.
- For age greater than 75 years the 5-year cardiovascular risk is greater than 15% in nearly all individuals.

Risk level: 5-year CV risk (fatal and non-fatal)	**Benefits: NNT for 5 years to prevent one event** (CVD events prevented per 100 people treated for 5 years)		
	1 intervention (25% risk reduction)	**2 interventions (45% risk reduction)**	**3 interventions (55% risk reduction)**
30%	13 (7.5 per 100)	7 (14 per 100)	6 (16 per 100)
20%	20 (5 per 100)	11 (9 per 100)	9 (11 per 100)
15%	27 (4 per 100)	15 (7 per 100)	12 (8 per 100)
10%	40 (2.5 per 100)	22 (4.5 per 100)	18 (5.5 per 100)
5%	80 (1.25 per 100)	44 (2.25 per 100)	36 (3 per 100)

Based on the conservative estimate that each intervention: aspirin, blood pressure treatment (lowering systolic blood pressure by 10 mm Hg) or lipid modification (lowering LDL-C by 20%) reduces CV risk by about 25% over 5 years.

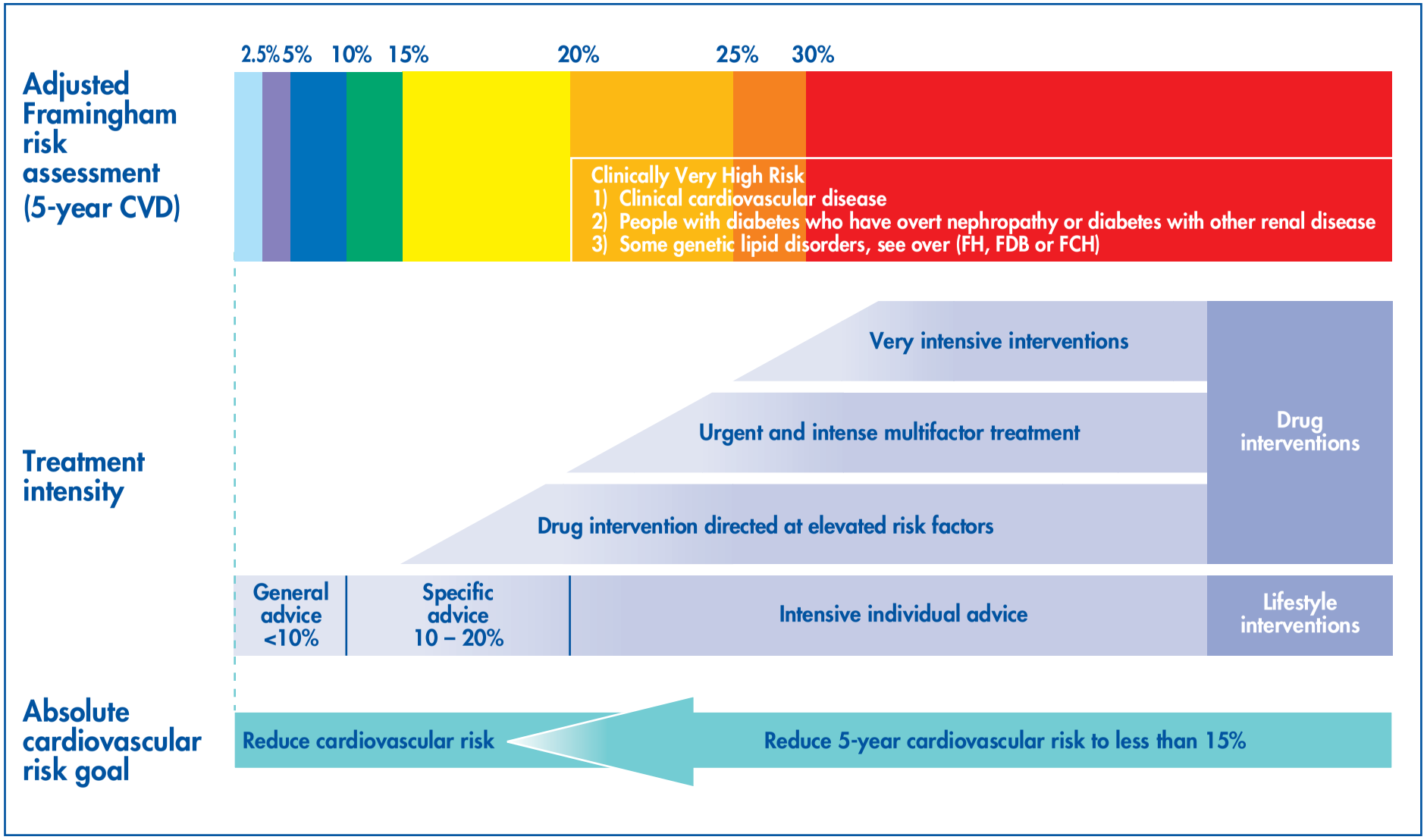

Figure 3: Treatment decisions based on 5-year cardiovascular risk

The higher the person's absolute risk of a cardiovascular event the more aggressively modifiable risk factors should be managed.

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Table 2: Intervention according to cardiovascular risk assessment

Cardiovascular risk	Lifestyle	Drug therapy	Treatment goals	Follow-up
CVD risk clinically determined* more than 20%	Intensive lifestyle advice on a cardioprotective dietary pattern with a dietitian, physical activity and smoking cessation interventions. Lifestyle advice should be given simultaneously with drug treatment	Aspirin, if not contra-indicated, a beta blocker, statin and an ACE-inhibitor (after MI) or aspirin, statin and a new or increased dose of a blood pressure lowering agent (after stroke)	Efforts should be made to reach optimal risk factor levels	Cardiovascular risk assessments at least annually, risk factor monitoring every 3 to 6 months
CVD risk calculated more than 20%	Intensive lifestyle advice on a cardioprotective dietary pattern with a dietitian, physical activity and smoking cessation interventions. Lifestyle advice should be given simultaneously with drug treatment	Aspirin and drug treatment of all modifiable risk factors (blood pressure lowering, lipid modification and glycaemic control)	Risk factors treated to a level that will lower 5-year cardiovascular risk to less than 15% (by recalculating risk)	Cardiovascular risk assessments at least annually, risk factor monitoring every 3 to 6 months
15 to 20%	Specific individualised lifestyle advice on a cardioprotective dietary pattern, physical activity and smoking cessation. This lifestyle advice should be given by the primary health care team for 3 to 6 months prior to initiating drug treatment	Aspirin and drug treatment of all modifiable risk factors (blood pressure lowering, lipid modification and glycaemic control). Drug therapy indicated for people with extreme risk factor levels#	Risk factors treated to a level that will lower 5-year cardiovascular risk to less than 15% (by recalculating risk)	Cardiovascular risk assessments at least annually, risk factor monitoring every 3 to 6 months
10 to 15%	Specific individualised lifestyle advice on a cardioprotective dietary pattern, physical activity and smoking cessation. This lifestyle advice should be given by the primary health care team	Non-pharmacological approach to treating multiple risk factors	Lifestyle advice aimed at reducing cardiovascular risk	Further cardiovascular risk assessment in 5 years
less than 10%	General lifestyle advice on a cardioprotective dietary pattern, physical activity and smoking cessation	Non-pharmacological approach to treating multiple risk factors	Lifestyle advice aimed at reducing cardiovascular risk	Further cardiovascular risk assessment in 5 to 10 years

*People who have had a previous cardiovascular event (angina, myocardial infarction, angioplasty, coronary artery bypass grafts, transient ischaemic attacks, ischaemic stroke or peripheral vascular disease) OR people with certain genetic lipid disorders (FH, FDB ,FCH) OR people with diabetes and overt diabetic nephropathy OR people with diabetes and renal disease

People with isolated high risk factor levels either total cholesterol greater than 8 mmol/L or TC:HDL ratio greater than 8 or blood pressure greater than 170/100 mm Hg should have these risk factors treated regardless of their calculated cardiovascular risk.