**Cardiovascular disease: risk assessment and reduction, including lipid modification**

**1.1 Identifying and assessing cardiovascular disease risk for people without established cardiovascular disease**

**Identifying people for full formal risk assessment**

1.1.1 For the primary prevention of cardiovascular disease (CVD) in primary care, use a systematic strategy to identify people who are likely to be at high risk of CVD. [2008, amended 2014]

1.1.2 Prioritise people based on an estimate of their CVD risk before doing a full formal risk assessment. Estimate their CVD risk using CVD risk factors already recorded in primary care electronic medical records. [2008]

1.1.3 Review estimates of CVD risk on an ongoing basis for people over 40. [2008]

1.1.4 Prioritise people for a full formal risk assessment if their estimated 10-year risk of CVD is 10% or more. [2008, amended 2014]

1.1.5 Discuss the process of risk assessment with the person identified as being at risk, including the option of declining any formal risk assessment. [2008]

1.1.6 Do not use opportunistic assessment as the main strategy in primary care to identify CVD risk in unselected people. [2008]

**Full formal risk assessment**

1.1.7 Use the QRISK3 tool to calculate the estimated CVD risk within the next 10 years for people aged between 25 and 84 without CVD. [2023]

1.1.8 Use the QRISK3 tool for people with type 2 diabetes aged between 25 and 84. [2023]

1.1.9 Do not use a risk assessment tool for people who are at high risk of CVD, including people with:

- type 1 diabetes (see the section on primary prevention of CVD for people with type 1 diabetes)

- an estimated glomerular filtration rate less than 60 ml/min/1.73 m2 and/or albuminuria (see the section on primary and secondary prevention of CVD for people with chronic kidney disease)

- familial hypercholesterolaemia (see NICE's guideline on familial hypercholesterolaemia) or other inherited disorders of lipid metabolism. [2023]

1.1.10 Recognise that CVD risk tools may underestimate risk in certain groups of people, including but not limited to:

- people treated for HIV

- people already taking medicines to treat CVD risk factors

- people who have recently stopped smoking

- people taking medicines that can cause dyslipidaemia such as immunosuppressant drugs

- people with severe mental illness

- people with autoimmune disorders, and other systemic inflammatory disorders. [2023]

1.1.11 Consider people aged 85 or older to be at increased risk of CVD because of age alone, particularly people who smoke or have raised blood pressure. [2023]

**Communication about risk assessment, lifestyle changes and treatment**

1.1.12 Follow the recommendations on communication in NICE's guidelines on patient experience in adult NHS services and shared decision making. [2014]

1.1.13 Set aside adequate time during the consultation to provide information on risk assessment and to answer any questions. Arrange for further consultation if needed. [2008, amended 2023]

1.1.14 Document the discussion relating to the consultation on risk assessment and the person's decision. [2008]

1.1.15 Offer people information about their absolute risk of CVD and the absolute benefits and harms of any intervention over a 10-year period. [2008]

1.1.16 Consider using a lifetime risk tool such as QRISK3-lifetime to inform discussions on CVD risk and to motivate lifestyle changes, particularly for people with a 10-year QRISK3 score less than 10%, and people under 40 who have CVD risk factors. [2023]

1.1.17 To encourage the person to participate in reducing their CVD risk:

- find out what, if anything, the person has already been told about their CVD risk and how they feel about it

- explore the person's beliefs about what determines future health (this may affect their attitude to changing risk)

- assess their readiness to make changes to their lifestyle (diet, physical activity, smoking and alcohol consumption), to undergo investigations and to take long- term medication

- assess their confidence to make changes to their lifestyle, undergo investigations and take medication

- inform them of potential future management options based on current evidence and best practice

- involve them in developing a shared management plan

- check that they have understood what has been discussed. [2008, amended 2014]

1.1.18 If the person's CVD risk is at a level where treatment is recommended but they decline the offer of treatment, advise them that their CVD risk should be reassessed in the future. Record their choice in their medical records. [2008, amended 2014]

**1.2 Aspirin for primary prevention of cardiovascular disease**

1.2.1 Do not routinely offer aspirin for primary prevention of CVD. [2023]

**Behaviour change**

1.3.1 Advise and support people at high risk of or with CVD to achieve a healthy lifestyle in line with NICE's guideline on behaviour change: general approaches. [2014, amended May 2023]

1.3.2 Advise people at high risk of or with CVD to eat a diet in which total fat intake is 30% or less of total energy intake, saturated fats are 7% or less of total energy intake, and where possible saturated fats are replaced by mono‑unsaturated and polyunsaturated fats. [May 2023]

1.3.3 Advise people at high risk of or with CVD to:

- reduce their saturated fat intake

- increase their mono-unsaturated fat intake with olive oil, rapeseed oil or spreads based on these oils and to use them in food preparation. [2014]

1.3.4 Take account of a person's individual circumstances – for example, drug therapy, comorbidities and other lifestyle changes when giving dietary advice. [2014]

**Physical activity**

1.3.5 Advise people at high risk of or with CVD to do aerobic and muscle-strengthening activities in line with the UK Chief Medical Officers' physical activity guidelines. [2008, amended 2014]

1.3.6 Encourage people who are unable to perform moderate intensity physical activity because of comorbidity, medical conditions or personal circumstances to exercise at their maximum safe capacity. [2008, amended 2014]

1.3.7 Advice about physical activity should take into account the person's needs, preferences and circumstances. Agree goals and provide the person with written information about the benefits of activity and local opportunities to be active, in line with recommendation 2 of NICE's guideline on physical activity: brief advice for adults. [2008]

1.3.8 Follow recommendation 8 of NICE's guideline on walking and cycling, and recommendation 2 of NICE's guideline on exercise referral schemes. [2008]

**Weight management**

1.3.9 Offer people at high risk of or with CVD who are overweight or obese appropriate interventions in line with NICE's guideline on obesity: identification, assessment and management. [2008]

**Alcohol consumption**

1.3.10 For advice on how to keep the health risks from drinking alcohol to a low level, see the UK Chief Medical Officer's alcohol consumption guidelines. [2008]

**Smoking cessation**

1.3.11 Advise and support all people who smoke to stop, in line with the recommendations on treating tobacco dependence in NICE's guideline on tobacco. [2008]

**Plant stanols and sterols**

1.3.12 Do not advise any of the following to take plant stanols or sterols to prevent CVD:

- people being treated for primary prevention

- people being treated for secondary prevention

- people with CKD

- people with type 1 diabetes

- people with type 2 diabetes. [2014]

**1.4 Initial lipid measurement and referral for specialist review**

1.4.1 Measure both total blood cholesterol and high-density lipoprotein (HDL) cholesterol to achieve the best estimate of CVD risk. [2008]

1.4.2 Use clinical findings, a full lipid profile and family history to judge the likelihood of a familial lipid disorder, rather than using strict lipid cut-off values alone. [2014, amended 2023]

1.4.3 Exclude possible common secondary causes of dyslipidaemia (such as excess alcohol intake, uncontrolled diabetes, hypothyroidism, liver disease and nephrotic syndrome) before referring for specialist review. [2014]

1.4.4 Use the recommendations in NICE's guideline on familial hypercholesterolaemia to determine whether to suspect, and how to treat, familial hypercholesterolaemia. [2014, amended 2023]

1.4.5 Arrange for specialist assessment of people with a total blood cholesterol concentration over 9.0 mmol/litre or a non-HDL cholesterol concentration over 7.5 mmol/litre even in the absence of a first-degree family history of premature coronary heart disease. [2014]

1.4.6 Refer for urgent specialist review if a person has a triglyceride concentration over 20 mmol/litre that is not a result of excess alcohol intake or poor glycaemic control. [2014]

1.4.7 In people with a triglyceride concentration between 10 and 20 mmol/litre:

- repeat the triglyceride measurement with a fasting test (after an interval of 5 days, but within 2 weeks) and

- review for potential secondary causes of hyperlipidaemia and

- seek specialist advice if the triglyceride concentration remains over 10 mmol/ litre. [2014]

1.4.8 In people with a triglyceride concentration between 4.5 and 9.9 mmol/ litre:

- be aware that the CVD risk may be underestimated by risk assessment tools and

- optimise the management of other CVD risk factors present and

- seek specialist advice if non-HDL cholesterol concentration is over 7.5 mmol/ litre. [2014]

**1.5 Discussions and assessment before starting statins**

**Discuss risks and benefits of statins**

1.5.1 Make decisions about starting statin treatment after an informed discussion between the clinician and the person about the risks and benefits of statins. [2023]

1.5.2 Take into account potential benefits from lifestyle changes, the person's preferences, the presence of any comorbidities, whether they are on multiple medications, whether they are frail and their life expectancy. (See also NICE's guideline on multimorbidity.) [2023]

1.5.3 Advise people who are being offered a statin that the risk of muscle pain, tenderness or weakness associated with statin use is small and the rate of severe muscle adverse effects (rhabdomyolysis) because of statins is extremely low. [May 2023]

**Discuss possible interactions between statins and other substances**

1.5.4 Advise people who are being treated with a statin:

- that other drugs, some foods (for example, grapefruit juice) and some supplements may interfere with statins and

- to always consult the patient information leaflet, a pharmacist or prescriber for advice when starting other drugs or thinking about taking supplements. [May 2023]

**Perform baseline blood tests and clinical assessment**

1.5.5 Before starting statins perform baseline blood tests and clinical assessment. Include all of the following in the assessment: smoking status, alcohol consumption, blood pressure (see NICE's guideline on hypertension in adults), BMI or other measure of obesity (see NICE's guideline on obesity: identification, assessment and management), full lipid profile, diabetes status, renal function, transaminase level (alanine aminotransferase or aspartate aminotransferase), thyroid-stimulating hormone level in people with symptoms of underactive or overactive thyroid. [May 2023, amended December 2023]

1.5.6 Do not routinely exclude from statin treatment people who have liver transaminase levels that are raised but are less than 3 times the upper limit of normal. [May 2023]

1.5.7 Before offering a statin, ask the person if they have had persistent generalised unexplained muscle symptoms (pain, tenderness or weakness), whether associated or not with previous lipid-lowering treatment. If they have, measure creatine kinase levels. If creatine kinase levels are:

- more than 5 times the upper limit of normal, re-measure creatine kinase after 7 days; if creatine kinase levels are still 5 times the upper limit of normal, do not start statin treatment (see the section on when statins are contraindicated or not tolerated)

- raised but less than 5 times the upper limit of normal, start statin treatment at a lower dose. [May 2023]

**Choice of drug based on clinical trials**

1.5.8 Be aware that when deciding on lipid-lowering treatment to prevent CVD, drugs are preferred for which there is evidence in clinical trials of a beneficial effect on CVD morbidity and mortality. [2008]

**Statins and pregnancy**

1.5.9 Be aware that statins are contraindicated in pregnancy because of the risk to the unborn child of exposure to statins. [2014, amended May 2023]

1.5.10 Explain that:

- statins should be stopped if pregnancy is a possibility

- statins should be stopped 3 months before attempting to conceive

- statins should not be restarted until breastfeeding is finished. [2014, amended May 2023]

**1.6 Statins for primary prevention of cardiovascular disease**

**Lipid target for people taking statins**

1.6.1 For primary prevention of CVD aim for a greater than 40% reduction in non-HDL cholesterol. [May 2023]

**Optimising lifestyle changes**

1.6.2 Before offering statin treatment for primary prevention, discuss the benefits of lifestyle changes and optimise the management of all other modifiable CVD risk factors if possible. [2023]

1.6.3 Recognise that people may need support to change their lifestyle. To help them do this, refer them to programmes such as exercise referral schemes or weight management services. (See NICE's guidelines on behaviour change: individual approaches, physical activity: exercise referral schemes and weight management: lifestyle services for overweight or obese adults.) [2023]

1.6.4 Offer people the opportunity to have their risk of CVD assessed again after they have tried to change their lifestyle. [2023]

1.6.5 If lifestyle change is ineffective or inappropriate offer statin treatment. [2023]

**Treating comorbidities and secondary causes of dyslipidaemia**

1.6.6 Before starting statins, treat comorbidities and secondary causes of dyslipidaemia. [May 2023]

**Primary prevention for people with and without type 2 diabetes**

1.6.7 Offer atorvastatin 20 mg for the primary prevention of CVD to people who have a 10-year QRISK3 score of 10% or more. [2023]

1.6.8 Do not rule out treatment with atorvastatin 20 mg for the primary prevention of CVD just because the person's 10-year QRISK3 score is less than 10% if they have an informed preference for taking a statin or there is concern that risk may be underestimated. [2023]

1.6.9 For people aged 85 and older consider treatment with atorvastatin 20 mg. Be aware of factors that may make treatment inappropriate (see recommendations 1.5.1 and 1.5.2). [2023]

See also the section on follow-up of people started on statin treatment.

**People with type 1 diabetes**

1.6.10 Offer statin treatment for the primary prevention of CVD to adults with type 1 diabetes who:

- are older than 40 years or

- have had diabetes for more than 10 years or

- have established nephropathy or

- have other CVD risk factors. [May 2023]

1.6.11 Consider statin treatment for the primary prevention of CVD for people aged 18 to 40 with type 1 diabetes, including those who have had diabetes for 10 years or less. [May 2023, amended December 2023]

1.6.12 When starting treatment with a statin for adults with type 1 diabetes, use atorvastatin 20 mg. [May 2023]

**1.8 Statins for primary and secondary prevention of cardiovascular disease in people with chronic kidney disease**

1.8.1 Offer atorvastatin 20 mg for the primary or secondary prevention of CVD to people with CKD. [2023]

1.8.2 If the lipid target for primary or secondary prevention of CVD (see recommendation 1.6.1 and recommendation 1.7.1) is not met and eGFR is 30 ml per minute per 1.73 m2 or more, increase the dose of atorvastatin. [May 2023, amended December 2023]

1.8.3 Agree the use of higher doses with a renal specialist if eGFR is less than 30 ml/min/1.73 m2. [2023]

**1.9 Optimising treatment for people on statins**

1.9.1 If the lipid target for primary or secondary prevention of CVD (see recommendation 1.6.1 and recommendation 1.7.1) is not met:

- discuss adherence and timing of dose

- encourage them to continue improvements to their diet and lifestyle, and to make further changes if appropriate

- consider increasing the statin intensity/dose if the person is not currently taking a high-intensity statin at the maximum tolerated dose. [2023]

1.9.2 If the person reports adverse effects when taking a high-intensity statin, discuss the following strategies with them:

- stopping the statin and trying again when the symptoms have resolved to check if the symptoms are related to the statin

- changing to a different statin in the same intensity group (rosuvastatin if already receiving atorvastatin)

- reducing the dose

- changing to a lower-intensity statin. [2014, amended May 2023 and December 2023]

1.9.3 If a person is not able to tolerate a high-intensity statin, aim to treat with the maximum tolerated intensity and dose of statin. [2014, amended December 2023]

1.9.4 Advise the person that any statin at any dose reduces CVD risk. [2014, amended May 2023 and December 2023]

**1.11 Assessing response to treatment**

**When to repeat blood tests**

1.11.1 Measure liver transaminase and full lipid profile at 2 to 3 months after starting or changing lipid-lowering treatment. [May 2023, amended December 2023]

1.11.2 Measure liver transaminase at 12 months, but not again unless clinically indicated. [May 2023, amended December 2023]

**When to measure creatine kinase**

1.11.3 Advise people who are being treated with a statin to seek medical advice if they develop unexplained muscle symptoms (pain, tenderness or weakness). If this occurs, measure creatine kinase. [May 2023]

1.11.4 If people report muscle pain, tenderness or weakness while taking a statin and have a creatine kinase level less than 5 times the upper limit of normal, reassure them that their symptoms are unlikely to be due to the statin and explore other possible causes. [May 2023]

1.11.5 Do not measure creatine kinase levels in asymptomatic people who are being treated with a statin. [May 2023]

**Increase in blood glucose or HbA1c**

1.11.6 Do not stop statins because of an increase in blood glucose level or HbA1c. (See the recommendations on assessing for risk of diabetes mellitus in NICE's guideline on preventing type 2 diabetes.) [May 2023]

**Restarting statins**

1.11.7 Remind the person to restart the statin if they stopped taking it because of drug interactions or to treat intercurrent illnesses. [May 2023]

**Annual medication review**

1.11.8 Provide annual medication reviews for people on lipid-lowering treatment. [May 2023, amended December 2023]

1.11.9 Offer an annual full lipid profile to inform discussions about secondary prevention of CVD. [May 2023, amended December 2023]

1.11.10 Consider an annual full lipid profile to inform discussions about primary prevention of CVD. [May 2023, amended December 2023]

1.11.11 During the annual medication review:

- discuss and encourage medicines adherence, if the shared decision is to continue with lipid-lowering treatment

- discuss and encourage dietary and lifestyle changes if appropriate

- address CVD risk factors. [May 2023, amended December 2023]

1.11.12 Discuss with people who are stable on a low-intensity statin or medium‑intensity statin the likely benefits and potential risks of changing to a high-intensity statin when they have a medication review and agree with the person whether a change is needed. [May 2023]