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Cardiovascular risk assessment

Cardiovascular risk assessment purpose[1] [2]

Cardiovascular disease (CVD) accounts for a quarter of all deaths in the UK. Risk factors that increase a person's risk of developing CVD include:

- Non-modifiable: age, male, family history of CVD, and ethnic background (eg, people of South Asian origin have an increased risk).

- Modifiable: smoking, high LDL cholesterol, lack of physical activity, unhealthy diet, alcohol intake above recommended levels, being overweight and having obesity.

- Comorbidities: hypertension, diabetes mellitus, chronic kidney disease, dyslipidaemia, rheumatoid arthritis, influenza, serious mental health problems, and periodontitis.

Within the Health Check Programme in England, everyone aged 40-74 years, not already diagnosed with CVD, diabetes, or chronic kidney disease, is invited every five years for a free health check, which includes a CVD risk assessment, as well as an assessment of alcohol consumption, physical activity, cholesterol level, body mass index (BMI), an assessment for dementia in those aged 65-74 years, and screening for diabetes mellitus and chronic kidney disease in those at increased risk.[3]

The calculated CVD risk is an estimate and needs some clinical judgement to help the person make appropriate and informed choices. Most people can reduce their risk by changes in lifestyle, optimising treatment of relevant comorbidities, and by drug treatment, if needed. Lifestyle advice should be provided to everyone, irrespective of their calculated CVD risk, and should include: smoking cessation, weight loss if overweight or having obesity, healthy diet, alcohol consumption within the recommended limits, and being physically active.

How to use the cardiovascular risk assessment tools[1]

Identifying people for full formal risk assessment

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.

- 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.

- Review estimates of CVD risk on an ongoing basis for people over 40.

- Prioritise people for a full formal risk assessment if their estimated 10-year risk of CVD is 10% or more.

- Discuss the process of risk assessment with the person identified as being at risk, including the option of declining any formal risk assessment.

- Do not use opportunistic assessment as the main strategy in primary care to identify CVD risk in unselected people.

Full formal risk assessment

Use the QRISK3 tool to calculate the estimated CVD risk within the next 10 years for people (including those with type 2 diabetes) aged between 25 and 84 without CVD. The 10-year CVD risk should be assessed using the QRISK assessment tool every five years (excluding people who already have CVD or high risk of developing it, or people aged 85 years or over). See 'Further Reading' below for link to QRISK®3 calculator.

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.

A patient-centred approach is essential and the risk assessment should be documented in the record. Decisions on treatment should be made after full explanation, and due note taken of the patient's needs and preferences.

To fill in the QRISK3 assessment tool, complete as many fields as possible, including:

- Personal details: age, sex, ethnicity, postcode.

- Clinical information: smoking status, and selected medical and family history, systolic blood pressure and standard deviation of at least two most recent systolic blood pressure readings, height and weight, and the total cholesterol/high-density lipoprotein (HDL)-cholesterol ratio from a non-fasting blood sample.

Consider also testing HbA1c and kidney function for people at increased risk of developing diabetes or chronic kidney disease as part of a general health check.

Statin treatment should be offered for the primary prevention of CVD to people with an estimated 10-year CVD risk of 10% or more if lifestyle interventions have not proved effective. Atorvastatin 20 mg a day is the recommended statin for primary prevention. Do not routinely offer aspirin for primary prevention of CVD. See the article on Prevention of Cardiovascular Disease for further information.

Who should NOT have a cardiovascular risk assessment?[1] [2]

Formal risk assessment is not necessary for the following people, as they are considered already to be at high enough risk to justify lifestyle and other interventions (antithrombotic, antihypertensive and lipid-lowering therapies):

- Already known to have CVD.

- Aged 85 years or over: should be considered at high risk because of age alone, especially smokers and people with high blood pressure.

- Patients at high risk of developing CVD because of familial hypercholesterolaemia, or other inherited disorders of lipid metabolism as identified by Simon Broome diagnostic criteria.[4]

People with type 1 diabetes mellitus or chronic kidney disease stages 3, 4, or 5 are at high risk, and so a CVD risk assessment is not required.

How to interpret the CVD risk score[2]

QRISK calculates a 10-year estimated risk of developing cardiovascular disease. The risk is expressed as a percentage. It is not a lifetime risk, which can be estimated using QRISK lifetime, a different calculator. 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.

The QRISK3 risk score will underestimate risk in certain situations, including:

- 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.

Further reading

- Risk estimation and the prevention of cardiovascular disease; Scottish Intercollegiate Guidelines Network - SIGN (2017)
- QRISK®3 calculator.
- Cardiovascular risk assessment and lipid modification; NICE Quality standard, May 2023

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