SECTION 8: Acting on the results

The NHS Health Check will identify individuals who are living with undiagnosed disease or who are at high risk of developing disease, who will require some additional clinical testing and follow-up. The guidelines include 'filters' for further action.

The Practice needs to ensure that it has robust processes, protocols and pathways in place to ensure patients are offered and receive the recommended follow up, for any patients who hit one or more of the Filter Criteria at their NHS Health Check as follows.

Table 1 NHS Health Check Filters

Filter indicating further follow up required	Filter criteria
CVD risk score (Qrisk) filter	≥10% - <20% moderate risk of CVD ≥20% high risk of CVD
Diabetes Filter	BP ≥140/90mmHg **and/or** BMI ≥30 (or 27.5 South Asian and Chinese)
Hypertension Filter	BP ≥140/90mmHg
Chronic Kidney Disease Filter	BP ≥140/90mmHg
Familial Hypercholesterolaemia filter	Total Cholesterol ≥7.5mmol/l
Alcohol use filter	AUDIT C ≥5 is positive → complete full AUDIT questionnaire:- AUDIT score ≥ 8
Atrial fibrillation filter	Irregular pulse

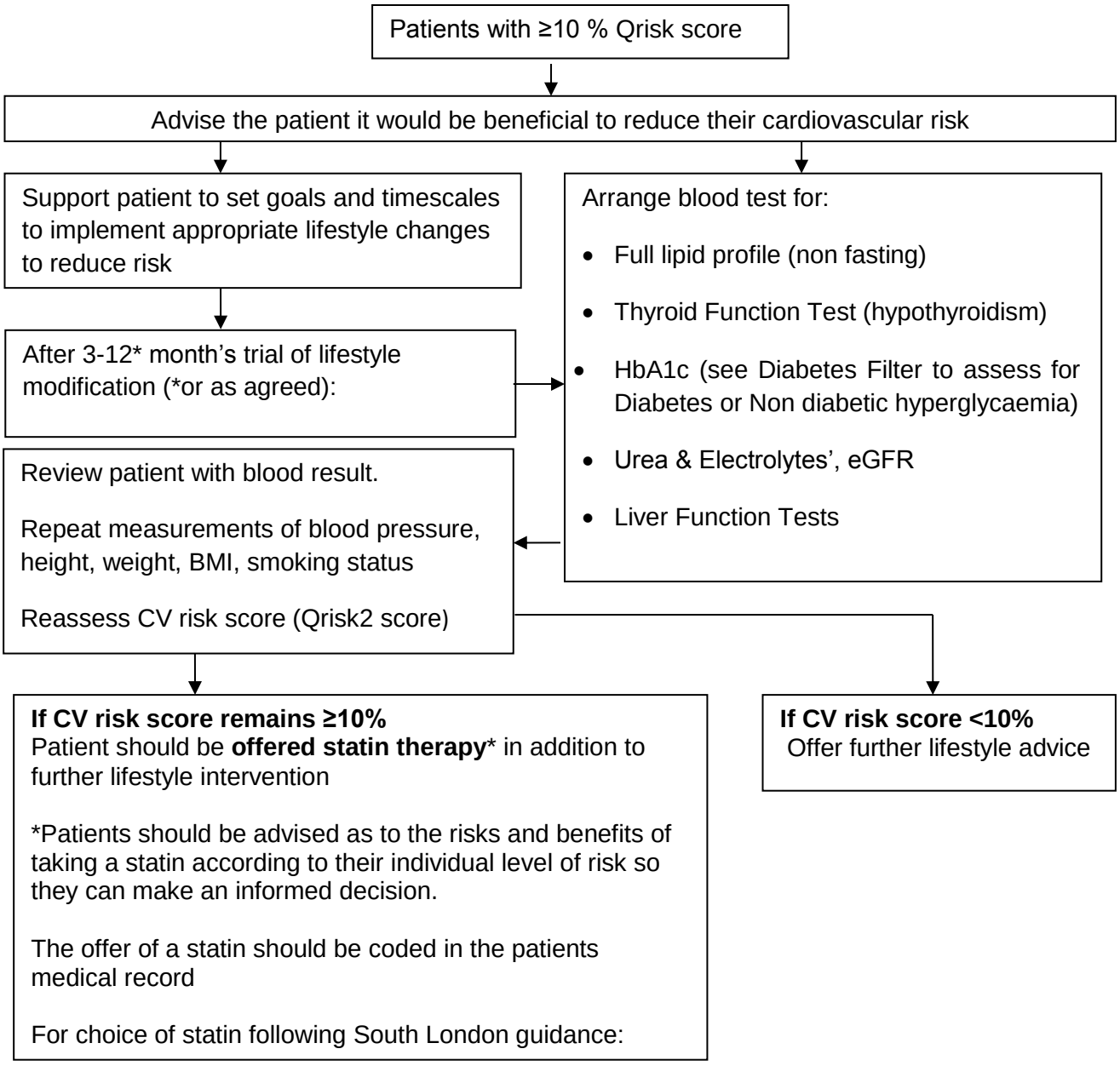
8.1 Cardiovascular Risk (Qrisk2 10year risk score) ≥10%

Individuals with a Qrisk2 score greater than or equal to 10%, should be offered statin therapy **after** a trial of lifestyle modification if their risk remains above 10% (NICE Guidelines Lipid Modification 2014)

However if there are no modifiable lifestyle risk factors then we recommend assessing patient for statin therapy and offering a statin to reduce their risk.

Please follow the steps below and refer to the South London algorithm for Lipid management in Primary and Secondary Prevention, which are based on NICE guidance but adapted and agreed for use locally:

Initial further assessment for CVD risk ≥10%



South London algorithm for Lipid management for Primary and Secondary prevention of CVD

http://www.lambethccg.nhs.uk/news-and-publications/meeting-papers/south-east-london-area-prescribing-committee/Documents/Cardiovascular%20Disease%20Guidelines/LIPIDS%20-

%20%20lipid%20management%20algorithm%20for%20CVD%20prevention%20Oct%202014.pdf

See also Appendix 15

Other useful guidance is **10 steps before you refer for lipids** - Appendix 16

For a printable version go to

https://bromley.mylifeportal.co.uk/uploadedFiles/Bromley/Bromley_Homepage/QuicklinkContent/Health_and_Wellbeing/NHS_Health_Checks_content/Toolkit/1O%20STEPS%20BEFORE%20YOU%20REFER%20FOR%20LIPIDS.pdf.

Atrial fibrillation assessment

Patients identified with an **irregular pulse** should receive a 12 lead ECG to identify the reason for the irregularity.

Patient diagnosed with Atrial fibrillation should have the appropriate diagnostic code added to their medical record and be managed according to national and local guidelines.

This will include assessment with $CHA_2DS_2VAS_C$ stroke risk score. If ≥2 the patient should be offered anticoagulation.

- Guidance links: CCG cardiology guidelines https://bromley.mylifeportal.co.uk/uploadedFiles/Bromley/Bromley_Homepage/QuicklinkContent/Health_and_Wellbeing/NHS_Health_Checks_content/Toolkit/CCG%20cardiology%20guidelines.pdf
- NICE guideline CG180 Atrial fibrillation: management 2014 https://www.nice.org.uk/guidance/cg180

Hypertension risk assessment

The practice will perform further hypertension risk assessments to detect and treat undiagnosed hypertension for patients with a blood pressure at or above **≥140/90 mmHg** or where either the systolic or diastolic blood pressure exceeds the respective threshold.

To identify persistent raised blood pressure these individuals should be offered either:

- 24-hour ambulatory blood pressure monitoring or
- Home blood pressure monitoring assessment for one week

plus

- they should receive assessment for target organ damage

Patients diagnosed with Hypertension should be managed as per Practice protocol, local CCG and national guidelines:

- CCG cardiology guidelines https://bromley.mylifeportal.co.uk/uploadedFiles/Bromley/Bromley_Homepage/QuicklinkContent/Health_and_Wellbeing/NHS_Health_Checks_content/Toolkit/CCG%20cardiology%20guidelines.pdf
- NICE guidelines CG127 Hypertension in adults: diagnosis and management

Chronic Kidney Disease (CKD) risk assessment

For any patient who has a raised blood pressure at or above either a 140 mmHg systolic or 90 mmHg diastolic at the time of the NHS Health Check, the practice will perform a serum creatinine test to calculate the estimated glomerular filtration rate (eGFR).

However if the patient has already had a serum creatinine within the past six months then the test need not be repeated.

Where eGFR is below 60ml/min/1.73m2,management and assessment for chronic kidney disease is required in line with national guidance NICE clinical guideline 182 on chronic kidney disease https://www.nice.org.uk/guidance/cg182

Alcohol risk assessment

A full AUDIT assessment is indicated if the shortened AUDIT C is a positive result - score ≥5

Audit C score should be added to the score for the subsequent 7 questions to calculate the final AUDIT score. If the individual meets or exceeds the AUDIT threshold of 8, brief intervention should be given

If an individuals' AUDIT score is 20 or more this may indicate alcohol dependence and consideration can be given to referring the individual to more structured alcohol treatment services. NICE public health guideline 24 Alcohol use disorders, June 2010 https://www.nice.org.uk/guidance/PH24

Assessment for familial hypercholesterolemia

- Patients with a total cholesterol >7.5mmol/L should be formally assessed for familial hypercholesterolemia
- Exclude secondary causes of hypercholesterolaemia before considering a diagnosis of familial hypercholesterolaemia.

Exclusion of secondary hyperlipidaemias – key investigations

Tests	Exclude
Renal profile	Chronic kidney disease
Liver profile	Cholestasis
Thyroid profile	Hypothyroidism
Glucose (fasting) and/or HbA1c	Diabetes
Dipstick urinalysis	Nephrotic syndrome

- consider any history of excess alcohol intake.
- Assess family history of premature coronary heart disease
- Full fasting lipid profile including LDL-C should be measured
- Absence of clinical signs (for example, tendon xanthomata) does not exclude a diagnosis of familial hypercholesterolemia
- The patient should be reviewed with the result of the blood tests to clarify diagnosis and assess for management. Refer to national guidance NICE guidelines CG71 Familial hypercholesterolaemia: identification and management 2008 (updated 2016). https://www.nice.org.uk/guidance/CG71
- Family members of those diagnosed with familial hypercholesterolemia should be screened.
- Once diagnosed, it is important the patient is managed appropriately with high intensity statin therapy and lifestyle interventions as per national guidance.
- CVD risk scores are not accurate and should not be taken into consideration when treating people with FH
- Where further guidance on diagnosis or management is required, referral to lipid specialists is recommended.

Lipid Management for Familial Hyperlipidaemia in Adults

The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Familial Hyperlipidaemia (FH) is a genetic condition resulting in exceptionally high total cholesterol and LDL levels. People with FH are at high risk of premature CV disease and therefore require aggressive lipid-lowering therapy.
The diagnosis of FH should be confirmed by a specialist in line with the SLCSN FH Pathway

Lifestyle Advice and Blood Pressure Control

The following lifestyle issues should be addressed alongside statin therapy:

- Smoking cessation
- Diet (reduce saturated fats, include Mediterranean diet and oily fish twice a week, aim for body mass index (BMI) of 19 – 25kg/m^2, or a minimum of a 10% reduction in body weight)
- Alcohol moderation to within safe limits (up to 21 units per week for men and 14 units per week for women)
- Exercise (aim for a total of 30 minutes of moderate intensity physical activity (eg, brisk walking) at least 5x a week)

Blood pressure control - Treat if BP consistently over 140/90mmHg to achieve a BP of less than 140/90mmHg; more aggressive targets apply in patients with chronic kidney disease and diabetes

Initiating Therapy

Initiate a statin first-line in all patients with a diagnosis of familial hyperlipidaemia

First line choice: Simvastatin at a dose of 40mg with the evening meal.
Where simvastatin 40mg is contraindicated or not tolerated or there are drug interactions which limit the dose*, initiate a lower dose of simvastatin or consider an alternative agent, such as atorvastatin 20mg daily initially.

**Max dose 10mg daily with concomitant lipid-lowering dose of niacin*
**Max dose 20mg daily with concomitant amlodipine, diltiazem, amiodarone or verapamil*

Next Steps

- Repeat fasting lipid levels within three months of initiation
- Reinforce lifestyle issues and check adherence to medication
- **The aim of lipid lowering in FH is to achieve at least a 50% reduction in LDL from baseline. In patients not achieving this on simvastatin 40mg daily, consider switching to a higher intensity statin – i.e. atorvastatin 40mg daily, increasing to atorvastatin 80mg daily**
- In patients requiring additional LDL lowering despite higher intensity statin at maximal dose (or maximum tolerated dose), consider the addition of ezetimibe 10mg daily
- If at least a 50% reduction in LDL cholesterol is not achieved on higher intensity statin at maximal dose (or maximum tolerated dose) in combination with ezetimibe - refer for specialist advice
- If statin therapy is contraindicated or not tolerated, consider offering a fibrate, anion exchange resin or ezetimibe as an alternative
- FH patients should be reviewed annually, with lipid monitoring, to check efficacy and on-going adherence to therapy, and every five years should have a formal review with consideration given to seeking specialist advice if appropriate

For more information on contraindications and cautions to statin therapies, common drug interactions with statins and for guidance on safety monitoring – see SLCSN Guidance on Prescribing Statin Therapies, at www.slcsn.nhs.uk/prescribing.html. A lipid modification FAQ document can also be found on the website.

References

1. NICE Clinical Guideline 71: Familial Hyperlipidaemia. Aug 2008
2. MHRA Drug Safety Update Vol 6 Issue 1 - Simvastatin: updated advice on drug interactions – updated contraindications Aug 2012

Diabetes risk assessment

The practice will perform a diabetes risk assessment to detect high risk of diabetes and undiagnosed Type 2 diabetes for any patient who meets the diabetes filter criteria at the NHS Health Check

Diabetes Filter

- BMI ≥ 30 (or ≥ 27.5 if Black, Indian, Pakistani, Bangladeshi, other Asian or Chinese).

and/or

- A blood pressure threshold, at or above either a 140 mmHg systolic or 90 diastolic mmHg.

These patients should receive one of the following:

- An HbA1c test is recommended to be used for the screening and/or diagnosis of diabetes or high risk of diabetes (pre-diabetes) unless contraindicated.
- Where HbA1c is not appropriate, fasting plasma glucose test can be used.
- If the patient has had a normal HbA1c or fasting plasma glucose within the last six months then there is no need to repeat the test unless clinically indicated.
- The South London Diabetes Filter Pathway should be used to guide repeat tests, diagnosis and interventions required
- Where a patient is found to have non-diabetic hyperglycaemia they should be offered intensive lifestyle intervention to reduce the risk of developing diabetes. Eg, National diabetes programme or walking away from diabetes.

See below for the South London NHS Health Checks Filter Pathway.

For a printable version of this pathway, please see click on this link:

https://bromley.mylifeportal.co.uk/uploadedFiles/Bromley/Bromley_Homepage/QuicklinkContent/Health_and_Wellbeing/NHS_Health_Checks_content/Toolkit/South%20London%20NHS%20Health%20Checks%20Filter%20Pathway.pdf

South London NHS Health Check Diabetes Filter

Filter criteria: Age 40-74 and
- BP: Systolic ≥ 140mmHg and/or Diastolic ≥ 90mmHg
- Or BMI ≥ 30 kg/m^2
- Or BMI ≥ 27.5 kg/m^2 (South Asian/Chinese)

Perform HbA1c (+FBC[2]) Exclusions apply[1] (venous blood sample)

Perform HbA1c – Point of Care Testing* Exclusions[1]

If HbA1c ≥ 42mmol/mol (6.0%) Repeat HbA1c (+FBC[2]) (venous blood sample) Exclusions apply[1]

HbA1c ≥ 48mmol/mol (6.5%)
Type 2 diabetes very likely

If symptoms[3] Refer same day (immediately if necessary) to GP

If no symptoms
Retest within 4 weeks

HbA1c ≥ 48mmol/mol (6.5%)

HbA1c <48mmol/mol (6.5%)

Diagnosis Type 2 Diabetes
Exclusions apply[1]

HbA1c ≥ 42mmol/mol but <48mmol/mol
(≥6.0% but< 6.5%)
High risk of Type 2 Diabetes
(non-diabetic hyperglycaemia)

Offer an intensive lifestyle programme

Retest HbA1c
- **after 6 months** (if any previous test ≥48mmol/mol)
- **Or at least once a year** (if ≥42 but <48mmol/mol)
- (Or before if patient develops symptoms of diabetes)

Check Weight, BMI & BP at least once a year

If high suspicion of diabetes[4] an OGTT may be performed
(Should be considered as exceptional)

Fasting BG >7.8 and/or 120 minutes ≥ 11.1 mmol/mol

Oral Glucose Tolerance Test
(fasting BG, 75g oral glucose then blood glucose 120minutes)

HbA1c ≥ 37mmol/mol (5.5%) < 42mmol/mol (6.0%)
Moderate risk of diabetes
Offer brief intervention:
1. Discuss risk of developing diabetes
2. Help modify individual risk factors
3. Offer tailored support services

Retest at next NHS Health Check
(or every 3 years if additional risk factors for diabetes)[5]

HbA1c <37mmol/mol (5%)
Low risk of diabetes
Offer brief intervention:
1. Risk of developing diabetes
2. Benefits of a healthy lifestyle
3. Modifying risk factors

Retest at next NHS Health Check

Fasting <6.1mmol/l and 120 minutes < 7.8 mmol/l
High risk of Type 2 diabetes
(presumed normal glucose regulation on OGTT but high HbA1c)

Fasting < 7mmol/l and 120minutes <7.8 - <11.1 mmol/l
Impaired Glucose Tolerance

Fasting 6.1-6.9 mmol/l and 120 minutes < 7.8 mmol/l
Impaired Fasting Glycaemia

Offer an intensive lifestyle programme

Check Weight, BMI, BP and HbA1c at least once a year

*Relevant sites/ providers only: using approved POCT equipment: Afinion, B-Analyst, Cobas B101, DCA Vantage

[1] **HbA1c should not be used to diagnose/exclude diabetes if:**
- The patient has symptoms of less than 2 months duration, as an individual can be significantly hyperglycaemic without HbA1c having had sufficient time to rise.
- If a patient is acutely unwell (for the same reasons as above)
- In pregnancy.
- In patients aged 18 years or younger.
- In patients with suspected type 1 diabetes (e.g. presence of ketones) at any age.
- In patients taking medications that cause rapid glucose elevation (e.g. steroids & antipsychotic medications)
- In patients who have known genetic, haematological or illness-related factors that influence HbA1c and its measurement (see overleaf detailed guidance)
- In patients with known anaemia (Hb < 10.5g/dl) or taking iron supplement

In the above circumstances, a random venous glucose sample must be checked (≥ 11.1mmol/l is diagnostic of diabetes in the presence of diabetes symptoms.)

[2] **If no Full Blood Count (FBC) record within last 12 months**

[3] **Symptoms: polyuria, polydipsia, unexplained weight loss.**

[4] **If diabetes symptoms (as above) and/or multiple risk factors for developing diabetes.**

[5] **Additional risk factors for diabetes:** first-degree relative with diabetes, women who delivered baby weighting >4kgs or with diagnosis of Gestational Diabetes Mellitus or with Polycystic Ovary Syndrome, severe obesity, acanthosis nigricans and is more prevalent in people of South Asian, Chinese, African-Caribbean and black African descent.

Factors that interfere with HbA1c test results:

1- Inherited haemoglobin variants (hemoglobinopathies)1:

HbA1c test can be unreliable for diagnosing or monitoring diabetes and impaired glucose regulation.

- HbS: African & South or Central America (especially Panama), Caribbean islands, Mediterranean countries (such as Turkey, Greece, and Italy), India, and Saudi Arabia.
- HbC: West African descent.
- HbE: Asian, especially those of Southeast Asian descent. Common in Cambodia, Indonesia, Laos, Malaysia, Thailand, and Vietnam Also seen in southern China, India, the Philippines, and Turkey.
- HbSC: West African descent. Also found in East India, the Mediterranean, and the Middle East.

Homozygous state: HbA1c test should not be used for patients with condition such as HbSS (sickle cell anaemia), HbCC, HbEE or HbSC (sickled haemoglobin C disease). Even if an assay does not interfere with their variant, these patients may suffer anaemia, increased red blood cell turnover and transfusion requirements which can adversely affect HbA1c results2.

2- Factors that influence Hba1c and its measurement3

- Erythropoiesis Increased HbA1c: iron, vitamin B12 deficiency, decreased erythropoiesis. Decreased HbA1c: administration of erythropoietin, iron, vitamin B12, reticulocytosis, chronic liver disease.
- Altered Haemoglobin Genetic or chemical alterations in haemoglobin: haemoglobinopathies, HbF, methaemoglobin, may increase or decrease HbA1c.
- Glycation Increased HbA1c: alcoholism, chronic renal failure, decreased intraerythrocyte pH. Decreased HbA1c: aspirin, vitamin C and E, certain haemoglobinopathies, increased intra-erythrocyte pH. Variable HbA1c: genetic determinants.
- Erythrocyte destruction Increased HbA1c: increased erythrocyte life span: Splenectomy. Decreased A1c: decreased erythrocyte life span: haemoglobinopathies, splenomegaly, rheumatoid arthritis or drugs such as antiretroviral, ribavirin and dapsone.
- Assays Increased HbA1c: hyperbilirubinaemia, carbamylated haemoglobin, alcoholism, large doses of aspirin, chronic opiate use. Variable HbA1c: haemoglobinopathies. Decreased HbA1c: hypertriglyceridaemia.

3- Practical recommendations:

The relevance of above considerations are “invisible” in certain of the available assays. An updated list on effects of frequently encountered Hb variants and derivatives on HbA1c measurements can be found at: http://www.ngsp.org/factors.asp

Assays used locally:

- GSTT & King’s: Menarini H8040 column chromatography, not affected by Hb variants. Anaemia: only if significant <10g/L for a noticeable effect on result.
- Lewisham & Greenwich: Biorad Turbo ion exchange chromatography, affected by some variants but able to detect short red cell life span.
- PRUH: HPLC method (Biorad) which is not affected by Hb variants.
- NPT Afinion: boronate affinity separation, not affected by variants except HbF 4.

A FBC is recommended if Hb variant status unknown or uncertain or clinically suspected anaemia

(e.g. elderly, menorrhagia) or no Hb record in preceding 12 months.

1 Sickle Cell trait and other hemoglobinopathies and diabetes:
Important information for providers, National Diabetes Information Clearinghouse, available at http://diabetes.niddk.nih.gov/dm/pubs/hemovari-A1C/index.aspx
2 Factors that Interfere with HbA1c test results, National Glycohemoglobin Standardization Program, available at http://www.ngsp.org/factors.asp
3 Use of Glycated heamoglobin (HbA1c) in the diagnosis of diabetes Mellitus, abbreviated report of a WHO consultation, 2011, available at http://www.who.int/diabetes/publications/en/
4 Three of 7 hemoglobin A1c point-of-care instruments do not meet generally accepted analytical performance criteria, E. lenters-Westra & R. J. Slingerland, Clinical Chemistry, 1062-1072 (2014)

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