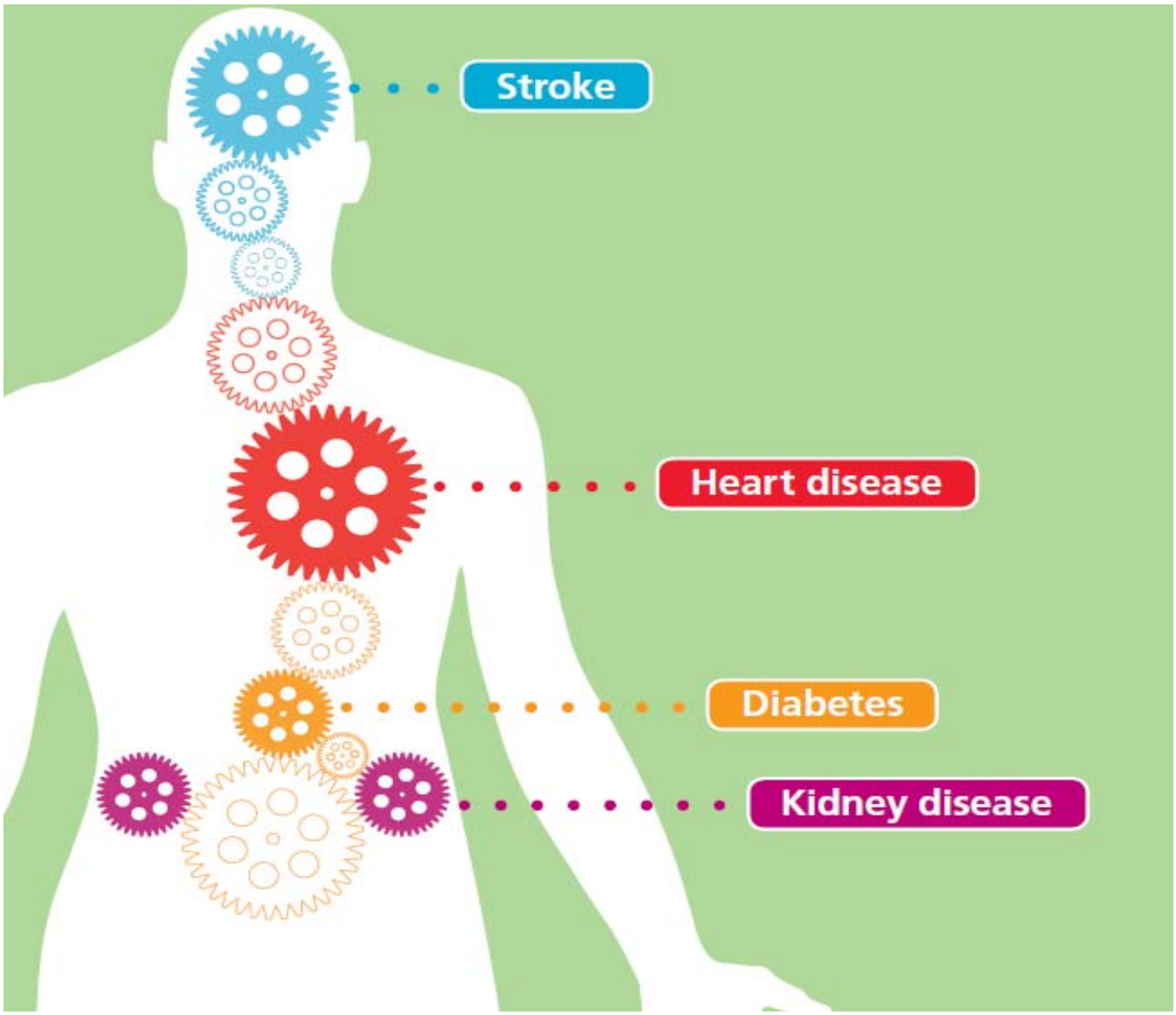
NHS Greenwich

NHS Health Check PLUS Programme Toolkit, May 2010, Version 1



Preface

The NHS Health Check PLUS Toolkit has been produced to support providers commissioned by NHS Greenwich to deliver the NHS Health Check PLUS Programme consistently within the borough in line with current best practice. This toolkit will be reviewed on a regular basis to reflect changes in national guidance or evidence based practice.

There are many individuals and teams who have contributed to the content of this toolkit, and in particular the NHS Health Check Project Team. I am grateful to all who have been involved in the production of this resource.

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NHS Greenwich NHS Health Check PLUS Programme Toolkit
Version 1.0
May 2010

Acknowledgements

A production of this nature comes from the hard work of many people. We wish to offer our sincere thanks to everyone who has contributed to this Toolkit. In particular we would like to thank the following:

For their specific team contribution:

- NHS Health Checks Project Group
- The South London Cardiac & Stroke Network
- The NHS Greenwich Stop Smoking Team
- The NHS Greenwich Resources and Communications Team
- The NHS Greenwich Active for Health Programme Team
- The NHS Greenwich Food and Health Programme Team
- Greenwich IAPT Service Development Group
- NHS Greenwich Goal 2 Commissioning Board

For their individual contributions and inspiration:

- Dr Nike Arowobusoye, Consultant in Public Health
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- Wendy McDermott, Lead Therapist - Falls Team Community Rehabilitation Service
- Sadhna Murphy, Joint Head of Medicines Management
- Carol-Ann Murray, Project Manager Strategic Planning and Commissioning
- Chima Olughu, Goal 2 Programme Manager
- Julie Richardson, Head of GP Support & Delivery
- Sheila Taylor, CVD Prevention Project Coordinator

We would also like to acknowledge and say thank you to NHS Lambeth and in particular Dr Eric Cajeat for allowing us to use their JBS2/Q Risk and HbA1c discussion documents as identified within the NHS Health Check Lambeth Resource Pack, 2010.

Contents

Section 1: Introduction

1.1 Introduction

The NHS Health Check Programme is a national initiative identifying and managing cardiovascular risk in people aged 40-74. In Greenwich, this is being supplemented with a small number of additional brief checks that will support other prevention programmes (e.g. cancer screening, alcohol dependency, mental and respiratory health) hence the initiative is called the NHS Health Check PLUS Programme.

The NHS Health Check is not appropriate for populations who already have cardiovascular or other related diseases, for example, Coronary Heart Disease (CHD), Chronic Kidney Disease (CKD), Stroke and Diabetes Mellitus (DM). These patients are already known to be high risk and assumed to be managed as part of being on a disease register.

1.2 Programme Rationale

Vascular disease includes coronary heart disease, stroke, diabetes and kidney disease. It currently affects the lives of over 4 million people in England. It causes 36% of deaths (170,000 a year in England) and is responsible for a fifth of all hospital admissions. It is the largest single cause of long-term ill health and disability, impairing the quality of life for many people. The burden of these conditions falls disproportionately on people living in deprived circumstances and on particular ethnic groups, such as South Asians. Vascular disease accounts for the largest part of the health inequalities in our society. [1]

Locally, the picture is worse. Greenwich currently has one of the highest mortality rates of CVD nationally and is 23 % higher than in London. The latest predicted life expectancy for men in Greenwich is 75.4 years and for women is 81.7 years. There is a gap of 2.42 years for men and 0.25 years for women between those living in Greenwich and those living in England. Circulatory disease and in particular coronary heart disease contributes to 24.3% of this gap in men. The rate of deaths due to circulatory disease is about 40% higher in the most deprived areas of Greenwich than in the least deprived, and this is true for both men and women. There is an estimated 18,389 people over 40 years old who either have undiagnosed disease or are at high risk of developing CVD in the next 10 years.[2]

Most Vascular Disease is considered to be preventable and there already exists a wealth of evidence around the effectiveness of the questions and measurements that the test would include. One of the largest studies is the INTERHEART study that identified nine key modifiable risk factors.[3]. The design of vascular checks nationally is based on advice from numerous experts inputting to the Vascular Programme Board who oversaw its development. The principle used in the design was that interventions would be included only if there was cost effectiveness data to support them and tests would be included only if there was cost effectiveness evidence of their use.[4] In response to the above national guidance was developed outlining best practice guidance for the NHS Health Check.[5]

Modelling undertaken by the Department of Health identified that nationally the programme could prevent 1,600 heart attacks and strokes, saving up to 650 lives per year and prevent over 4000 people from developing diabetes[6]. Local modelling has estimated that 335 CVD events may be saved over the 5 years of the programme, with a further 293 saved from improvements in secondary prevention for those already on disease registers[7].

As a result, NHS Greenwich is implementing this programme in order to:

- Reduce premature death from related vascular conditions including CHD, CKD, DM, and stroke.
- Reduce the incidence of these related vascular conditions
- Narrow inequalities in premature death from these related vascular conditions
- To use this systematic programme as an opportunity to improve outcomes in other priority public health programmes.

1.3 Purpose & Scope of the Toolkit

The NHS Health Check PLUS Toolkit has been produced to support providers commissioned by NHS Greenwich to deliver the NHS Health Check PLUS Programme consistently within the borough in line with current best practice. It is aimed at those undertaking the health checks, those administering or leading the process and those needing to respond to newly identified clinical need. It reflects the best practice guidance that exists at this current time and will need updating on a regular basis as new evidence becomes available.

1.4 Objectives of the Toolkit

To provide best practice guidance to those delivering the NHS Health Check PLUS Programme to ensure consistency, quality assurance and safety across the PCT by:

- Outlining how the check should be undertaken
- Describing how parameters and data should be measured and quality assured
- Identifying thresholds for the tests/filters which would trigger appropriate follow-up and interventions
- Outlining lifestyle brief interventions that can be undertaken at practice level and care pathways and referral mechanisms to other lifestyle support services
- Identifying best practice guidance in the management of clinical risk factors
- Providing a range of practical tools and information, such as sample invite letters

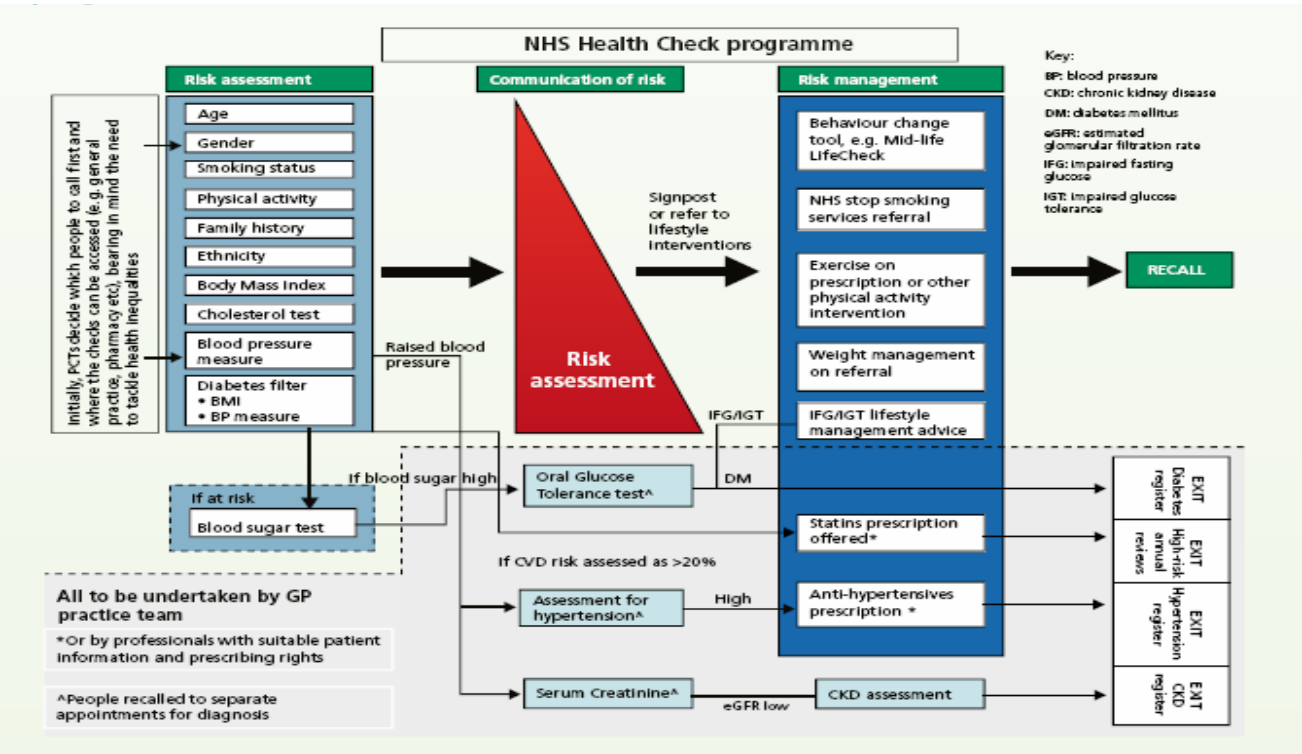
1.5 Summary of NHS Health Check PLUS Programme

All patients aged 40-74 years old will be entitled to a NHS Health Check every 5 years to assess and manage their vascular risk. The call and recall of patients will exclude those already with existing disease.

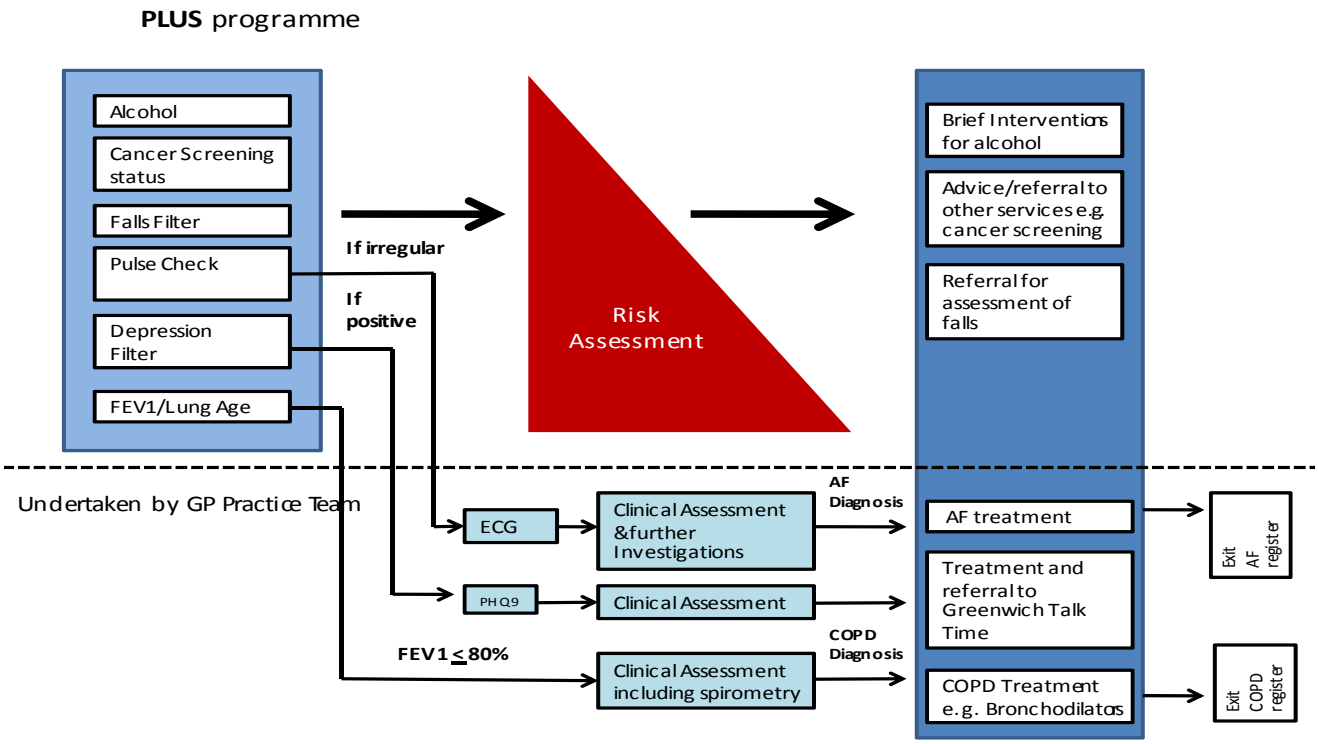
Figure 1 provides an overview of the National NHS Health Check and the local PLUS Programme.

Figure 1 Diagrammatic overview of the NHS Health Check PLUS programme

National NHS Health Check



PLUS Programme



1.6 Section 1: References

[1] Putting Prevention First, Vascular Checks: risk assessment and management, Department of Health, 2008
[2] Greenwich JSNA, 2009
[3] Yusuf, S., Hawken, S. et al. (2004). Effects of potentially modifiable risk factors associated with myocardial infarction in 52 countries (INTERHEART): case control study. The Lancet, 364 (9438), pp937-952
[4] Economic Modelling for Vascular Checks(DH-085917), DoH, 2008
[5] Putting Prevention First, NHS Health Check: Vascular Risk Assessment and Management. Best Practice Guidance, DoH, April 2009.
[6] Department of Health (2009) Vascular Briefing pack for strategic Health Authorities- NHS London
[7] NHS Greenwich CVD Modelling: The impact of the Goal 2 Programme on CVD Events, May 2010

Section 2: Arranging NHS Health Check PLUS Clinics

2.1 Staffing Requirements

***Lead Clinician**:* There should be a nominated lead clinician who is either a nurse, GP or other appropriate person who is responsible for overseeing the service. The lead clinician will be responsible for ensuring that all staff delivering this **service** have attended the appropriate training and acquired the necessary experience and competencies to deliver the service. They will also act as a point of contact for the NHS Health Check PLUS Programme.

Practitioners undertaking NHS Health Checks PLUS: There is no set guidance on who should undertake health checks, however, it is anticipated that they will be provided by Health Care Assistants, Nurses, Pharmacists and others. Staff providing the NHS Health Check PLUS Programme will need to attend the mandatory NHS Health Check PLUS Training and other modules supporting the delivery of the programme e.g. behavioural modification techniques etc. In addition, they should have all the necessary suitably calibrated equipment to undertake the check. The lead clinician will be responsible for doing this.

Administrator: The administrator will be responsible for general administrative support. This may be setting up access to the clinical system and issuing invitations and follow-up of any patients requiring ongoing care or who DNA. The administrator may also be responsible for reporting any minimum data set requirements to NHS Greenwich.

2.2 Equipment

The following is a sample guide to the range of equipment required to deliver the NHS Health Check PLUS Programme.

Measure	Equipment	Measuring range
Height	SECA Leicester Portable Height Measure	0 – 2.07 meters
HBA1c	Afinion Analyser System	4-15% HBA1c
Total Cholesterol HDL Cholesterol	LDX Cholestech	2.59 –12.93 mmol/L (TC) 0.39-2.59 mmol/L (HDL)
Blood Pressure	OMRON 7051T (BHS validated)	BP 0 – 299 mm Hg Pulse 40 – 180 /min
FEV1 (Lung Age)	Pulmolife	0- 8 Litres
Weight	SECA 884 Class III Floor scales with RS232 interface capability	Capacity 160 Kg x 200g

- All equipment should be calibrated in accordance with manufacturer's instructions.
- Practices will need to comply with quality assurance measures required for the safe and effective use of equipment.

- All operators of the equipment should be fully compliant in their use and prepare the equipment in accordance to manufacturer's instructions.
- A sharps container should be available for disposing of all sharps.
- Clinical waste will be disposed of via local pharmacies or via local general practices.

2.3 Venues & Times

The NHS Health Checks PLUS should be provided in dedicated clinics within a suitable, private environment such as a treatment room. A NHS Health Check PLUS should not be provided as part of another consultation.

The number and frequency of clinics should reflect the capacity required to deliver the health checks to the cohort specified within the LES. Likewise, the timing and location of the clinics should be planned to ensure good accessibility.

Consideration needs to be given to client groups that may require extended time, for example, adults with learning difficulties.

2.4 Near Patient Testing

Practices that have signed up to the 10/11 NHS Health Check PLUS LES will be provided with a Near Patient Testing (NPT) machine for Cholesterol and HbA_{1c}. This will enable all practices to deliver the initial risk assessment part of the check in a single visit with minimal impact on phlebotomy and pathology services.

2.5 Patient Information & Leaflets

Practices should ensure that all available leaflets are stocked within the practice. This will include the national patient information leaflet (to be enclosed in the invite letter) and any subsequent information that may support brief interventions e.g. healthy eating leaflets.

The NHS Health Check patient leaflet is available in a range of formats e.g. Braille, large print and audio, and translations e.g. Chinese, Czech, French, Somali, Bengal, Urdu, Guajarati, Punjabi, Hindi etc. A comprehensive list of information can be downloaded from the link below:
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/DH_097490

Hard copies of all information can be ordered from the DoH order line as below:
http://www.orderline.dh.gov.uk/ecom_dh/public/home.jsf

2.6 NHS Health Check Template

A template and associated guidance will be made available to record data gathered as part of the NHS Health Check. Training will be provided on the use of this template.

Please note that an administration toolkit providing further guidance on the NHS Health Check PLUS template and audit baseline procedures will be made available to practices shortly.

Section 3: Using a Risk Tool: The National Debate

3.1 JBS2 (Framingham Modified) Versus Q Risk

The Risk Assessment stage of the NHS Health Check uses a risk engine to calculate a person's 10 year risk of cardiovascular disease. In its 2008 Lipid modification guidance, NICE recommended that Framingham should be used to calculate a 10 year risk of cardiovascular disease.

However, two other risk engines have since been developed, JBS2 (which is a modified version of Framingham) and QRISK. As a result, there is widespread debate about which risk tool is the risk calculator of choice. This debate is exacerbated by the fact there has been no guidance given by the national NHS Health Check Programme or by NICE who in March 2010 announced a change to the recommendations in its lipid modification guideline (CG67) on cardiovascular risk assessment. The recommendations advising the use of the Framingham risk assessment tool were withdrawn stating "it is not clear that it (Framingham) is superior to other tools".

As a result, Healthcare professionals will now instead decide which risk assessment tool is most suitable for their needs.

3.2 PCT Preferred tool is JBS2

Risk communication is a fundamental step of the Health Check programme. The JBS2 risk tool is a modified version of the 1991 Framingham equation which includes risk adjustment for variables such as Triglycerides (TG), family history of CVD and ethnicity. It is extremely patient friendly and, at sector level, is currently viewed as superior to other risk calculators in supporting risk communication to patients. See Appendix 1 for the rationale for deciding to use JBS2 as the engine of choice.

To ensure consistency across the borough, Practices are advised to use the JBS2 risk engine. The JBS2 risk score can be downloaded and is linked directly on the NHS Health Check PLUS template.

Ultimately, a risk calculator is simply a tool; it does not replace clinical judgement and is only one part of the risk management process which requires effective communication of risk, behaviour change on the part of the patient, medical management and lifestyle support.

Section 4: Inviting patients to attend the Programme

4.1 Protocol for inviting patients to attend the programme

- During the planning phase identify the numbers of patients eligible for invite (as outlined in the LES) and as required as part of the baseline audit.
- Select the number of patients to be invited each month e.g. 80 initial letters will need to be sent in order to generate approximately 40 patients per month.
- Send an invitation letter enclosing a national NHS Health Check leaflet and a PLUS programme information insert.
- Record on the NHS Health Check PLUS template that a letter has been sent.
- If the patient does not attend an arranged/booked clinic appointment please record 'Did not attend' (NHS Health Check Clinic) on the template and send out a reminder invitation letter.
- On completion of initial health check appointment the patient should be offered the following:
  - A copy of any clinical findings.
  - A copy of any referral letters, for example, exercise referral forms.
  - A follow up appointment from the practice team if required e.g. for hypertension assessment, Diabetes assessment etc.
- On completion of the initial health check appointment the patient records should have:
  - NHS Health Check template completed.
  - Diary date entry for any practice follow up (where applicable)
- If the patient did not book after the first two attempts then:
  - Telephone to make another appointment.
  - Confirm appointment by sending appointment card and national NHS Health Check leaflet and a PLUS Programme information insert.
  - Record all patient contacts on the NHS Health Check PLUS Template.
  - If the patient contacts the surgery to decline the invitation, please record on template. If they would like to be invited at a later date please enter a diary date for screening.
  - If the patient states they don't wish to be contacted please enter on template.

NB: Please note that national NHS Health Check literature is available free of charge from the Department of Health web site and is available in a range of other languages. Please see section 2 for further details.

4.2 Sample Invitation Letter Template

Practice details
Phone number
Date

Dear Xxxx

We are writing to invite you to attend your free NHS Health Check PLUS at xxxx. Please call now and make an appointment. NHS Health Checks PLUS are being offered to people aged between 40 and 74 once every five years.

The check is to assess your risk of developing heart disease, stroke, kidney disease, diabetes and other disease. If there are any warning signs, then together we can do something about it. By taking early action, you can improve your health and prevent the onset of these conditions. There is good evidence for this.

The check should take about 20–30 minutes and is based on straightforward questions and measurements such as age, sex, family history, height, weight and blood pressure. There may also be a simple blood test to measure your cholesterol or blood sugar levels.

Following the check, you will receive free personalised advice about what you can do to stay healthy.

Take a look at the enclosed leaflet for more information about the national NHS Health Check and the PLUS Programme and how it could benefit you.

Yours sincerely

xxxxxxxxxxxxxxx
(Name of health care professional to go here)

Based on national template, adjusted to reflect PLUS Programme aspect. All letters should include the NHS Health Check strap line below.

Free NHS Health Check

Helping you prevent heart disease, stroke, diabetes and kidney disease.

4.3 Sample Reminder Letter Template

Reminder letter
Practice details
Phone number
Date

Dear

Reminder about invitation for NHS Health Check PLUS

You may remember that we wrote to you recently to invite you to make an appointment for a health check and possible blood test. I notice from our records that you have not yet booked an appointment.

We would like to encourage you to call as soon as possible and book an appointment for this important check. This will give you peace of mind about your risk of heart disease, having a stroke or developing diabetes and if we do detect anything out of the ordinary we can start to deal with it before it becomes serious. The appointment will only take 20-30 minutes and with our clinic times we can usually find a time that will be convenient for you.

Of course, if you do not wish to have your check done at this time but would like to be invited in the future please let us know.

With kind regards

xxxxxxxxxxxxxxxx

(Name of health care professional to go here)

Section 5: NHS Health Check PLUS Clinical Protocol

This section provides a step by step guide to delivering the NHS Health Check PLUS.

5.1 Stage 1: Identification of Cohorts

The NHS Health Check PLUS Local Enhanced Service provides details of the cohort schedules to be invited in the current year. This will be reviewed on an annual basis and is intended to ensure that those who are more likely to be at greater risk of CVD are called first.

5.2 Stage 2: Assessment of Risk Factors

To enable the practitioner to perform a health check, it is essential that a number of clinical measurements are taken as well as asking the client a number of questions. The results of the measurements and the answers to the questions will be recorded on the template.

Name	
NHS Number	
Mobile Phone Number	
Postcode	
D.O.B/Age	The age of the person should be between 40 and 74 years (inclusive)
Gender	The individual's reported gender should be recorded as male or female
Family history of coronary heart disease	Family history of coronary heart disease in first-degree relative under 60 years. First-degree relative means father, mother, brother or sister
Ethnicity	Self-assigned ethnicity. Where possible, ethnicity should be recorded using the Office for National Statistics categories[1]
Blood pressure	Should be checked following best practice guidance, see section 9.1. If raised do two more readings (one should be at the end of the check) and take the mean of the best two readings Both Systolic (SBP) and Diastolic Blood Pressure (DBP) are required for the diabetes filter, and for assessment for chronic kidney disease and hypertension **Thresholds: BP ≥140/90mmHg (or SBP ≥140mmHg or DBP is ≥ 90mmHg). Requires:** • Risk filter for diabetes (perform HbA1c test, see below) • Referral to the GP practice team for assessment for hypertension. Referral to the GP practice team for assessment for chronic kidney disease including a serum creatinine (eGFR)
Pulse (over 65's only)	Check for irregular pulse. ECG will be required if irregular. Refer to GP/NP/PN

<table>
<tr><td>Height Measurement</td><td>In metric, used for BMI calculation</td></tr>
<tr><td>Weight Measurement</td><td>In metric, used for BMI calculation</td></tr>
<tr><td>Body mass index</td><td>BMI provides one approach to identifying those at high risk of developing diabetes or who have existing undiagnosed diabetes. Height and weight measurement will be required

<table>
<tr><th colspan="2">Obesity</th></tr>
<tr><td>Classification</td><td>BMI</td></tr>
<tr><td>Under weight</td><td>Less than 18.5</td></tr>
<tr><td>Healthy weight</td><td>18.5-24.9</td></tr>
<tr><td>Overweight</td><td>25-29.9</td></tr>
<tr><td>Obesity I</td><td>30-34.9</td></tr>
<tr><td>Obesity II</td><td>35-39.9</td></tr>
<tr><td>Obesity III</td><td>40 or more</td></tr>
</table>

Thresholds:
BMI of 27.5 or over in individuals from the Indian, Pakistani, Bangladeshi, other Asian and Chinese ethnicity categories
BMI of 30 or over in other ethnicity categories.

• Anyone above the thresholds will require an HbA1c test</td></tr>
<tr><td>Waist Measurement</td><td>In metric, waist circumference is shown to be to be independently associated with increased age-adjusted risk of CHD

<table>
<tr><th colspan="3">Waist circumference</th></tr>
<tr><td></td><td>Men</td><td>Women</td></tr>
<tr><td>Low</td><td>< 94cm</td><td>< 80cm</td></tr>
<tr><td>Medium</td><td>94-102cm</td><td>80-88cm</td></tr>
<tr><td>High</td><td>> 102cm</td><td>>88 cm</td></tr>
</table></td></tr>
<tr><td>Cholesterol (non-fasting)</td><td>Total cholesterol and HDL, calculated TC/HDL Ratio
Thresholds: None Specified. There is no specific threshold for the NHS Health Check or for the primary prevention of vascular disease
• Refer to GP Practice team individuals with total cholesterol of >7.5mmol for consideration for familial hypercholesterolemia
• Those with 10 year risk ≥20% will need to be considered for lipid management by GP practice team</td></tr>
</table>

<table>
<tr><td>HbA1c</td><td>A random HbA1c Screening test should be performed on all individuals who meet the diabetes filter criteria, that is, have any of the following:
BP at, or above, 140/90mmHg or where the SBP or DBP exceeds 140mmHg or 90mmHg respectively
BMI of 27.5 or over in individuals from the Indian, Pakistani, Bangladeshi, other Asian and Chinese ethnicity categories.
BMI of 30 or over in other ethnicity categories
Thresholds<table><tr><th>HbA1c Levels</th><th>Possible Diagnosis</th><th>Care pathway</th></tr><tr><td>≥ 6.5% (≥47 mmol/mol)</td><td>Query diabetes</td><td>Appointment with GP Practice Team same day (if symptoms are present)</td></tr><tr><td>≥ 6 but < 6.5% (≥42 to 48 mmol/mol)</td><td>Non-diabetic hyperglycaemia</td><td>Intensive Lifestyle advice and Retest in two years.</td></tr><tr><td>< 6% (≤ 42 mmol/mol)</td><td>Presumed normal glucose regulation</td><td>No further testing although person needs to understand that they are still at risk.</td></tr></table></td></tr>
<tr><td>Lifestyle Factors</td><td>Assessment of physical activity levels (GPPAQ). Classify whether Inactive, Moderately Inactive, Moderately Active or Active. GPPAQ can be completed in waiting room (see Appendix 2)

Diet: In particular around fruit & vegetable consumption and fat and salt content of diet. This information does not need to be recorded on template, but can be used to tailor advice. Healthy Eating Quiz can be completed in waiting room (see Appendix 3)

Alcohol (Audit-C): first 3 questions used as a filter, those scoring 8 or above may receive brief intervention at separate appointment in line with alcohol DES

Thresholds<table><tr><th>Alcohol consumption</th><th>Score</th></tr><tr><td>Lower Risk Drinking</td><td>0-7</td></tr><tr><td>Increasing Risk Drinking</td><td>8-15</td></tr><tr><td>High Risk Drinking</td><td>16-19</td></tr><tr><td>Possible Dependency</td><td>20+</td></tr></table></td></tr>
<tr><td>Smoking status</td><td>Establish whether individual smokes/length of time since last smoked</td></tr>
<tr><td>FEV1/Lung Age (smokers only)</td><td>Used with Fletchers graph as a motivational technique to encourage people to stop smoking</td></tr>
<tr><td>Depression Filter</td><td>2 questions to filter for depression/languishing</td></tr>
<tr><td>Record of Cancer screening</td><td>This will be extracted onto template from GP records:
Up to date record of cervical smear
Females aged 25-49 eligible every 3 years
50-64 eligible every 5 years
Up to date record of breast screening</td></tr>
</table>

	o Females aged 50 to 70 eligible every 3 years* • Up to date record of bowel screening o male and female aged 60 to 75 *** age range currently being extended to 47-73**
Falls Risk Filter (over 65's only)	Establish whether person has fallen in the previous year. Asked as a filter for FRAT (Falls Risk Assessment Tool)

5.3 Stage 3: Communicating Risk

Everyone who undergoes a check should have the results of their NHS Health Check PLUS assessment conveyed to them. The communication of risk and what it means for the individual is of paramount importance to the programme meeting its objective of helping people stay well for longer. Levels of risk need to be discussed alongside what each individual can do to manage their risk, such as taking regular exercise, eating a healthy diet, reducing their calorie and alcohol intake as a way of managing their weight, and stopping smoking.

5.3.1 Communicating CVD Risk

Risk communication must be delivered by trained health care professional. The health professional should explain to the patient that everyone who has a health check is at risk of CVD; this risk may be increased by their medical history (i.e. diabetes, high blood pressure, kidney disease etc), family history or lifestyle (i.e. smoking, diet, physical inactivity etc). When communicating risk to a client it is important for the health professional **NOT** to talk of high and low risk so as not to convey either a false sense of alarm or a false sense of security. The clinician should explain the risk in terms of a percentage, for example "you have a 30% chance of developing a heart attack or stroke in the next ten years."

In circumstances where a client may be unable to understand their risk in terms of a percentage, the health professional may use a visual representation prop to support the verbal explanation as illustrated in figure 2.

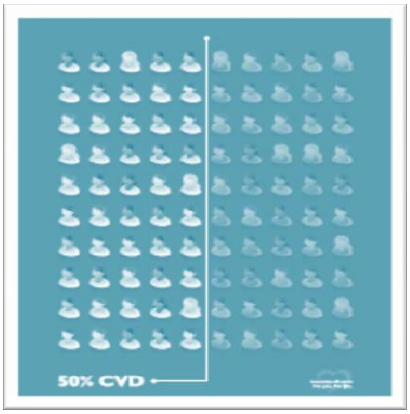


Figure 2 Visual representation prop to explain % risk

If the individual's risk is 20% or greater the health professional should explain that they will be referred to their GP for medical treatment and offered appropriate lifestyle support and referral as set out in the brief interventions and care pathways in section 6.

If the clients' blood pressure and/or blood glucose is found to be abnormal or if coincidental medical problems are discovered (regardless of CVD risk) the health professional should explain that they will be referred to a GP for medical treatment.

5.3.2 Communicating Lung Age

Results will be given in two forms: percentage of expected Forced Expiratory Volume (FEV1) and lung age. These should be interpreted with the visual aid of Fletcher's graph (see figure 3) to illustrate the impact of smoking to lung function.

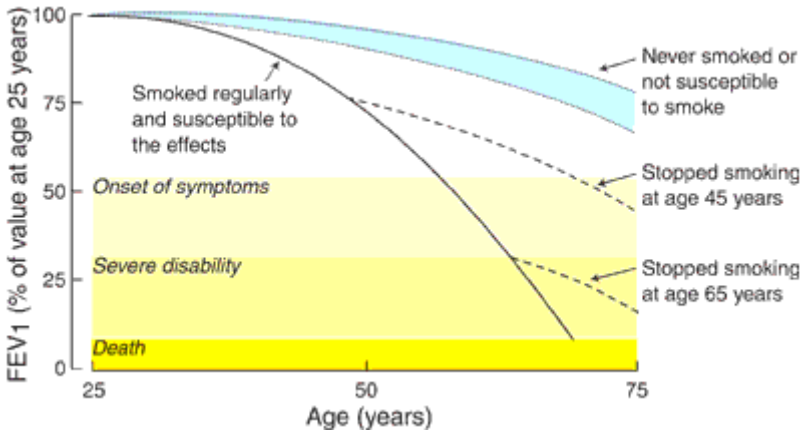


Figure 3: Fletcher's graph: Sourced from Fletcher C, Peto R. (1977).[2]

Forced Expiratory Volume is the first second of expiration. There is evidence that the use of FEV1 and Lung Age (using Fletcher's graph) increases smoking quit rates[3]. It is also a useful tool to detect early signs of Chronic Obstructive Pulmonary Disease (COPD).

Lung Age is equal to the predicted FEV1 that matches the patients FEV1. Estimation of 'Lung Age' can be used to demonstrate to smokers the damage caused to their lungs by smoking in a way they can understand.

Individuals with an FEV1 ≤ 80% of predicted should be referred to the GP Practice Team as there is a possibility of COPD.

5.3.3 Communicating risks of BMI and waist circumference

Assessment of the health risks associated with overweight and obesity in adults should be based on BMI and waist circumference as outlined in Table 1:

CLASSIFICATION OF OVERWEIGHT AND OBESITY by BMI. Waist Circumference, and Associated Disease Risk*				
	BMI (kg/m2)	Obesity Class	Disease Risk (relative to Normal Weight and Waist Circumference)	
			Men ≤ 102cm (40in.) Women ≤ 88cm (35in.)	Men > 102cm (40 in.) Women > 88cm (35 in.)
Underweight	< 18.5		-	-
Normal	18.5-24.9		A	A
Overweight	25.0-29.9		Increased (B)	High (C)
Obesity	30.0-34.9	I	High (C)	Very High(C)
	35.0-39.9	II	Very High (C)	Very High (C)
Extreme Obesity	≥ 40.0	III	Extremely High	Extremely High

*** Disease risk for type 2 diabetes, hypertension, and CVD**

Please note Increased waist circumference can also be a marker for increased risk even in person's of normal weight.

Adapted from "Preventing and managing Global Epidemic Obesity Report of the World Health Organisation Consultation of Obesity" WHO, Geneva, June 1997[4]

Table 1: Risks associated with BMI and waist circumference

5.4 Stage 4: Risk Management and Interventions

5.4.1 Provision of Lifestyle Advice

All patients should be offered lifestyle advice to reduce their cardiovascular risk. The health care professional will discuss with the patient any lifestyle changes which they wish to make and this should be recorded on the NHS Health Check PLUS template along with all lifestyle advice given. Any lifestyle advice or interventions given at the practice should be in line with best practice guidance as outlined in each of the lifestyle intervention care pathways in **Section 6**. These include:

- Stopping smoking: See Stop Smoking Brief Intervention and Care Pathway
- Weight Management: See Weight Management Brief Intervention & Care Pathway
- Physical activity: See Physical Activity Brief Intervention & Care Pathway
- Dietary Management: See Healthy Eating Brief Intervention & Care Pathway
- Alcohol: See Alcohol Screening, Brief Intervention & Care Pathway

In line with lifestyle care pathways, healthcare professionals, when appropriate, should offer and refer patients for ongoing support from more structured programmes including NHS Greenwich Healthy Living Service – **GHLiS** (0800 587 5833) - for free Stop Smoking, healthy eating, physical activity and Health Trainer support; and GLL '**Healthwise'** (020 8317 5000 - ext 2130) - low cost exercise referral and weight management programme in Greenwich leisure centres. Table 2 summarises the key lifestyle interventions and advice expected to be provided to patients according to their level of risk.

10 Year CVD Risk Score	Category	Outcome
Risk ≥ 30%	CVD Very High Risk	Brief Lifestyle advice given in practice in line with care pathways for stop smoking, alcohol, weight management, physical activity and dietary management. See section 6 Refer to GLL 'Healthwise' programme for structured exercise on referral and weight management. Programme (020 8317 5000 - ext 2130) Refer to **GHLiS** (0800 587 5833) for free stop smoking

		support and / or co-ordinated support for other lifestyle changes (physical activity, healthy eating, weight management and mental well being). Practice based Stop Smoking Services (if available, applicable and in preference to GHLiS) Alcohol DES Brief Intervention (where applicable) Give - 'Your Guide to Being Healthy' booklet
Risk ≥20 to <30%	High Risk	Brief Lifestyle advice given in practice in line with care pathways for stop smoking, alcohol, weight management, physical activity and dietary management. See section 6 Refer to GLL **'Healthwise'** programme for structured exercise on referral and weight management programme (020 8317 5000 - ext 2130). Refer to **GHLiS** (0800 587 5833) for free stop smoking support and / or co-ordinated support for other lifestyle changes (physical activity, healthy eating, weight management and mental well being). Practice based Stop Smoking Services (if available and applicable and in preference to GHLiS) Alcohol DES Brief Intervention (where applicable) Give - 'Your Guide to Being Healthy' booklet
Risk ≥10% to <20%	Moderate Risk	Lifestyle advice given in practice in line with care pathways for stop smoking, alcohol, weight management, physical activity and dietary management. See section 6 General lifestyle advice & signposting Refer to **GHLiS** (0800 587 5833) for free stop smoking support and for telephone advice &/ support for other lifestyle changes (physical activity, healthy eating, weight management and mental well being). Practice based Stop Smoking Services (if available and applicable) Alcohol DES Brief Intervention (where applicable) Give - 'Your Guide to Being Healthy' booklet
Risk <10%	Low Risk	General lifestyle advice & signposting Practice based Stop Smoking Services (if available and applicable) or referral to stop smoking services in GHLiS) Alcohol DES Brief Intervention (where applicable)

		Give - 'Your Guide to Being Healthy' booklet

Table 2: Summary of lifestyle Interventions

5.4.2 Management of Clinical Risk Factors

As a result of the NHS Health Check PLUS, there may be a number of clinical issues identified that require management by the GP (or other professional with suitable patient information and prescribing rights). **Section 7** provides guidance on the management of these clinical risk factors and is based on NICE, sector and local best practice guidance. These include:

- Raised Blood pressure: refer to:
  - Hypertension Risk Assessment and Management
  - Chronic Kidney Disease Risk Assessment
- Raised Cholesterol: refer to:
  - Lipid Modification (Primary Prevention)
  - Familial Hypercholesterolaemia Care Pathway
- Raised HBA1c: Refer for Diabetes Risk Assessment & Management
- Reduced FEV1: Refer for COPD Risk Assessment
- Irregular Pulse: Refer for Atrial Fibrillation Risk Assessment & Management

5.4.3 Management of other factors related to PLUS Programme

The healthcare professional will need to advise, manage or refer for further assessment in relation to the PLUS aspects of the check.
Section 8 provides further details on recommended advice and interventions. These include:

- Not up to date with cancer screen: See Cancer Screening Care Pathway
- Has fallen in last year (over 65s): See Falls Risk Assessment & Care Pathway
- Depression filter**:** See Depression Care Pathway

5.5 Stage 5: Follow up and Audit

Patients on established primary prevention treatment should be reviewed annually as a minimum. Review more frequently during monitoring and medication titrations as per individual practice protocols.

5.5.1 Data Collection & Audit

Data should be collected in line with that identified in the NHS Health Check PLUS Local Enhanced Service specification and should be entered onto the NHS Health Check PLUS Template. In addition to practice based health checks there will be a number screened in community settings. When this occurs information regarding these checks will need to be sent to the practice and data should be entered onto the NHS Health Check Template.

Review of the risk group may be performed annually. This will include:

- Validation of the registers; with cross checks of the appropriate read codes and prescribing.

- Records of risk factors and levels of control, including smoking status, blood pressure, lipids and glucose, BMI, cholesterol, physical activity, and alcohol intake.
- Evidence of review in line with the recorded recall date.

5.5.2 Evaluation

The service will be subject to a full evaluation by NHS Greenwich. In addition a national evaluation framework is being developed.

5.6 Section 5:References

[1] A practical guide to ethnic monitoring in the NHS and Social Care. DH/Health and Social Care Information Centre/NHS Employers. 29 July 2005. Gateway reference: 5227.
[2] Fletcher C. & Peto R. (1977): British Medical Journal. June 25;1(6077): 1645-8.
[3] G. Parkes et al (2008) Effect on smoking quit rate of telling patients their lung age: the Step2quit randomised controlled trial. BMJ, Mar, 2008.
[4] Preventing and managing Global Epidemic Obesity Report of the World Health Organisation Consultation of Obesity. WHO, Geneva, June 1997.

Section 6: Lifestyle Support Care Pathways

6.1 Stop Smoking Brief Intervention and Care Pathway

Everyone who smokes should be advised to stop. People who are not ready to stop smoking should be asked to consider it. Even brief intervention has strong evidence to show it is effective in increasing the number of patients who have a quit attempt and go on to successfully stop smoking. A summarised brief intervention and an example conversation are provided in Table 3 and Table 4 below:

VERY BRIEF ADVICE (AAA) 30 seconds to save a life	
ASK and record smoking status Smoker- ex-smoker-non-smoker	**QOF POINTS**
ADVISE patient of health benefits Stopping smoking is the best thing you can do for your health	
ACT on patient's response Build confidence, give information, refer, prescribe Succeed with local NHS Stop Smoking Service	**QOF POINTS**

Table 3: Very Brief Intervention

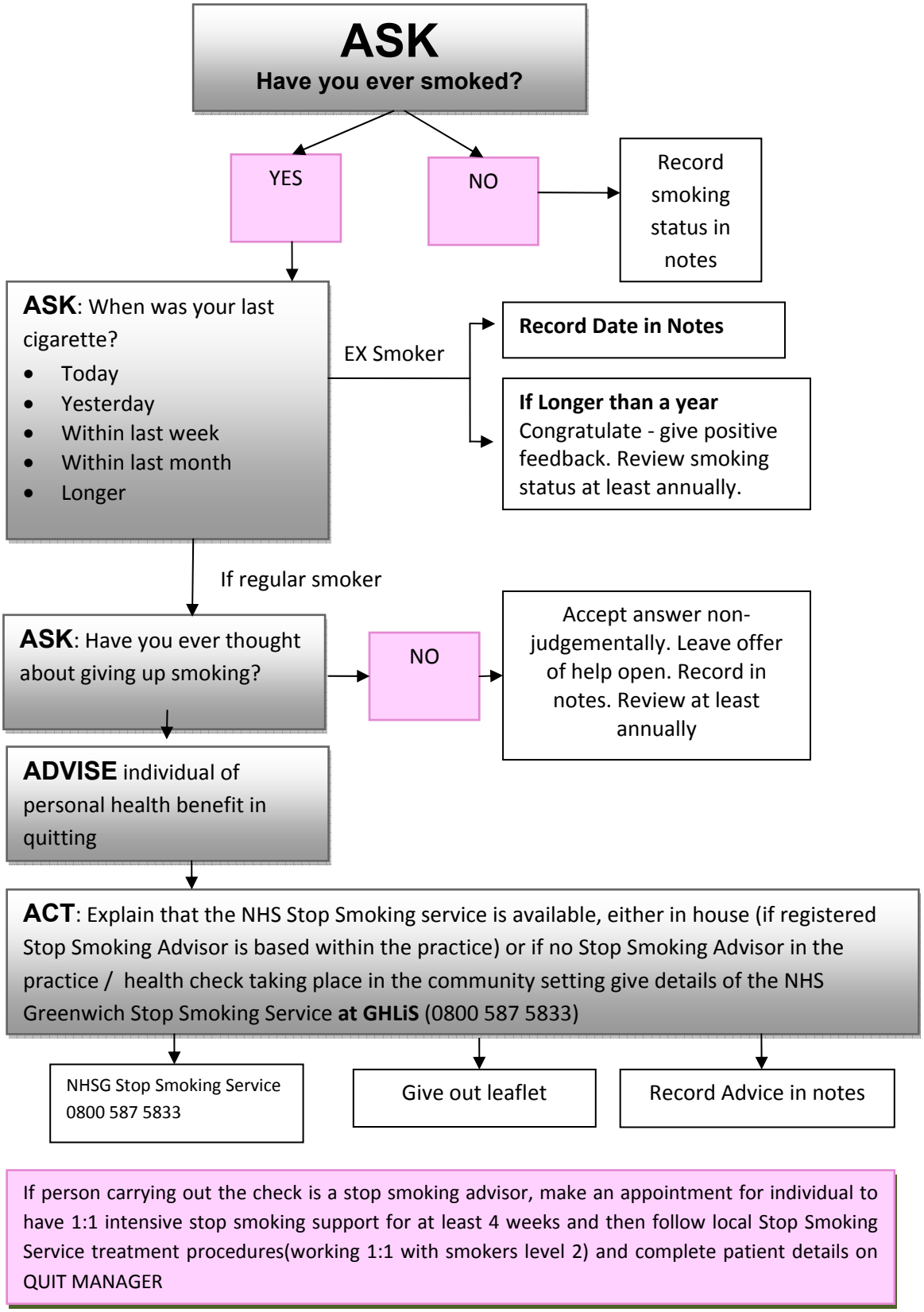
"Are you smoking at all these days?"

Stopping smoking is really the best thing you can do to improve your health. I really recommend that you see our local stop smoking service. You are up to four times more likely to quit successfully with their support. You can quit by getting individual support or by joining a group with other smokers, which is really effective. And it's free.

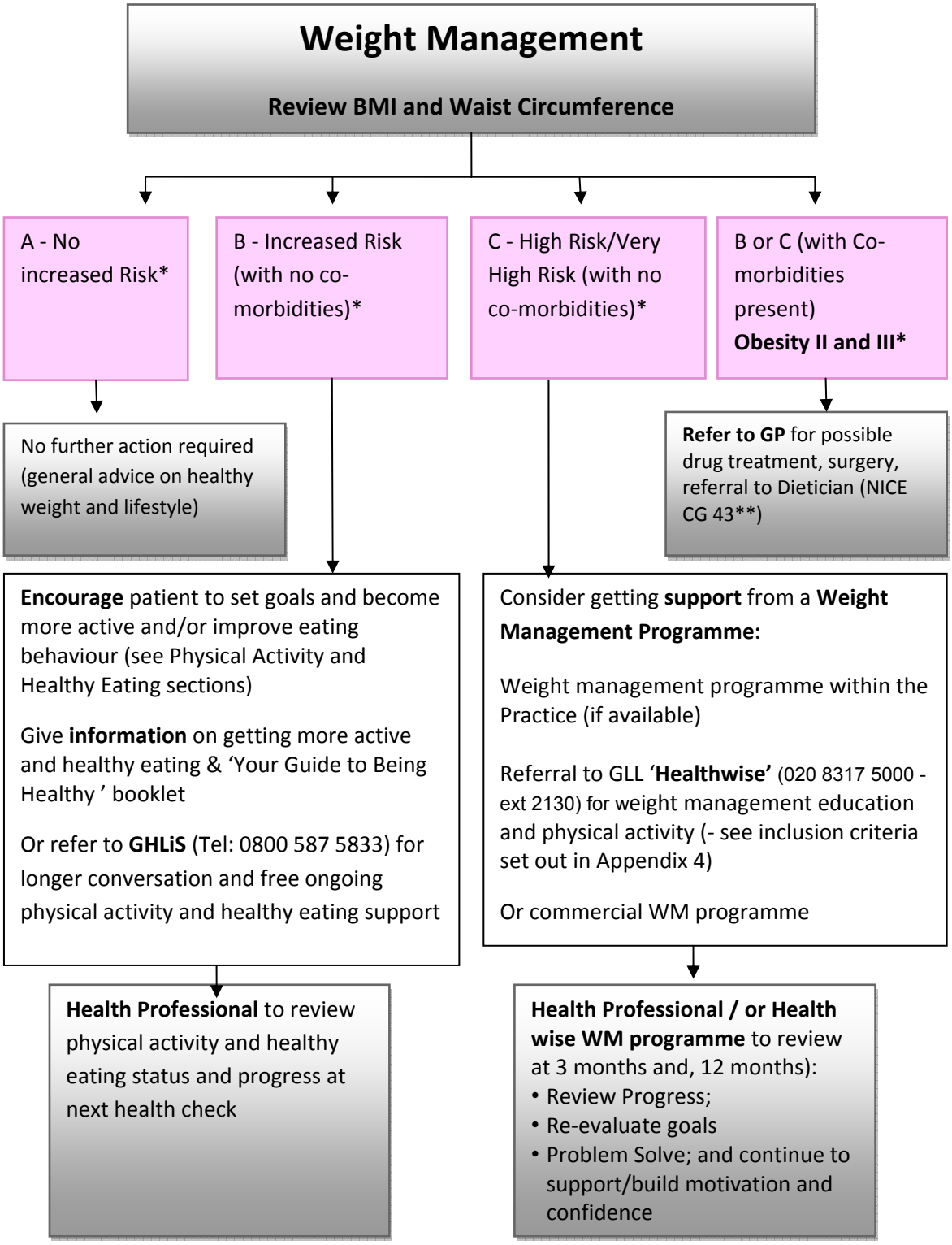
Lots of my patients have been able to quit with their help, getting tips on dealing with cravings, stop smoking medication and they can really help you stay motivated too."

Table 4: Example conversation

Stop Smoking Brief Intervention and Care Pathway cont.



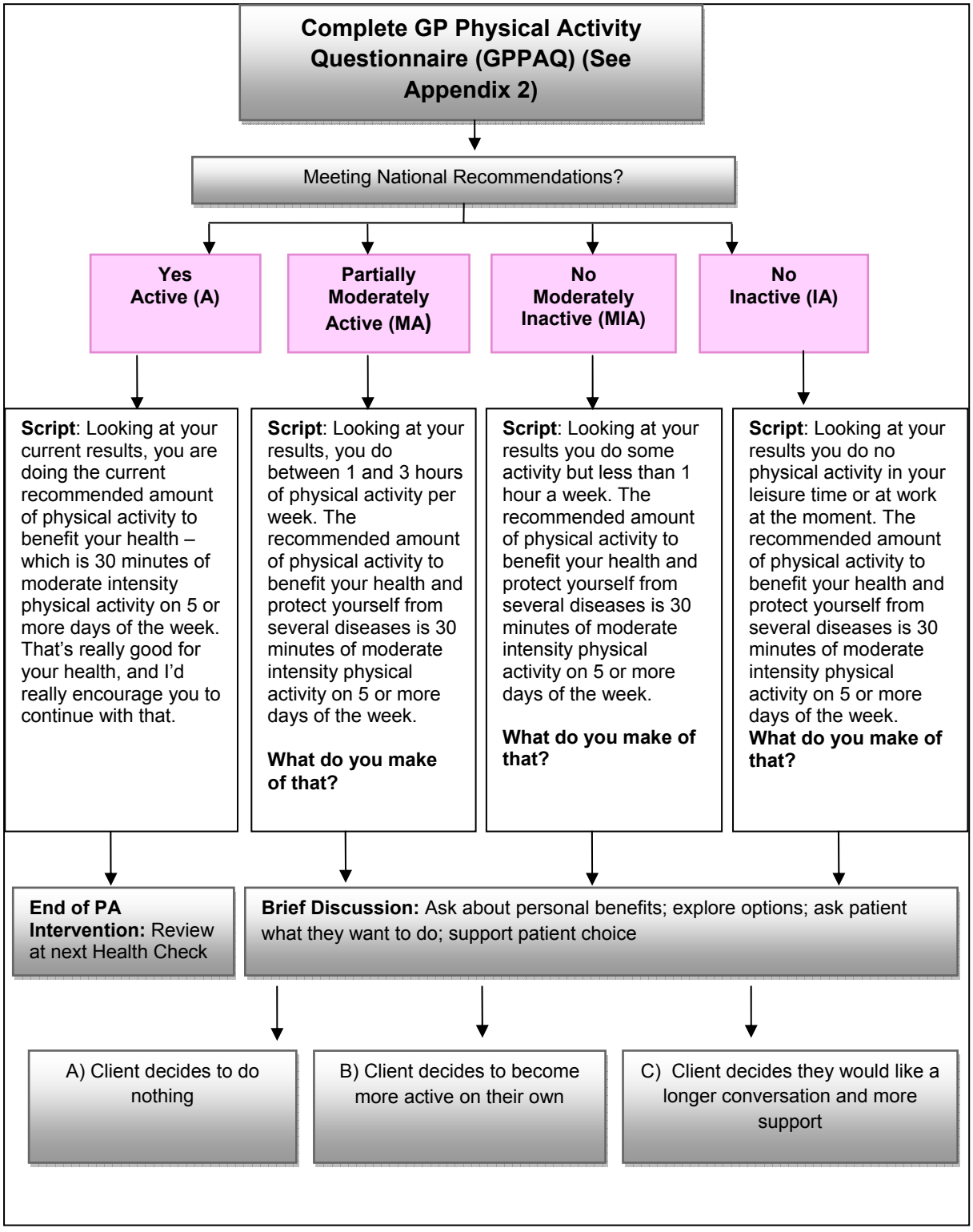
6.2 Weight Management Brief Intervention & Care Pathway



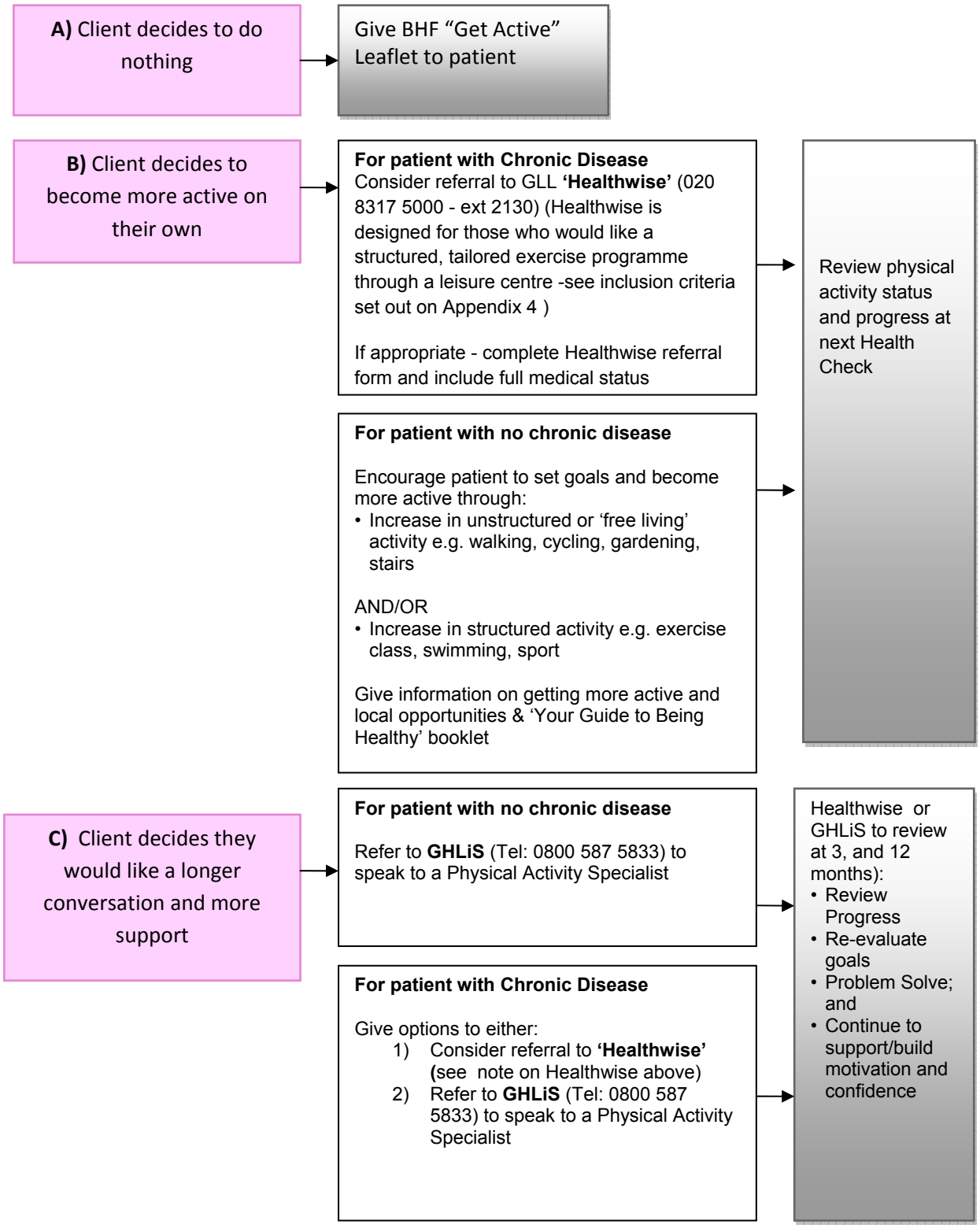
*See classification of overweight and obesity Table found in Section 5.3.3

**See NICE Obesity Guidance CG 43[1]

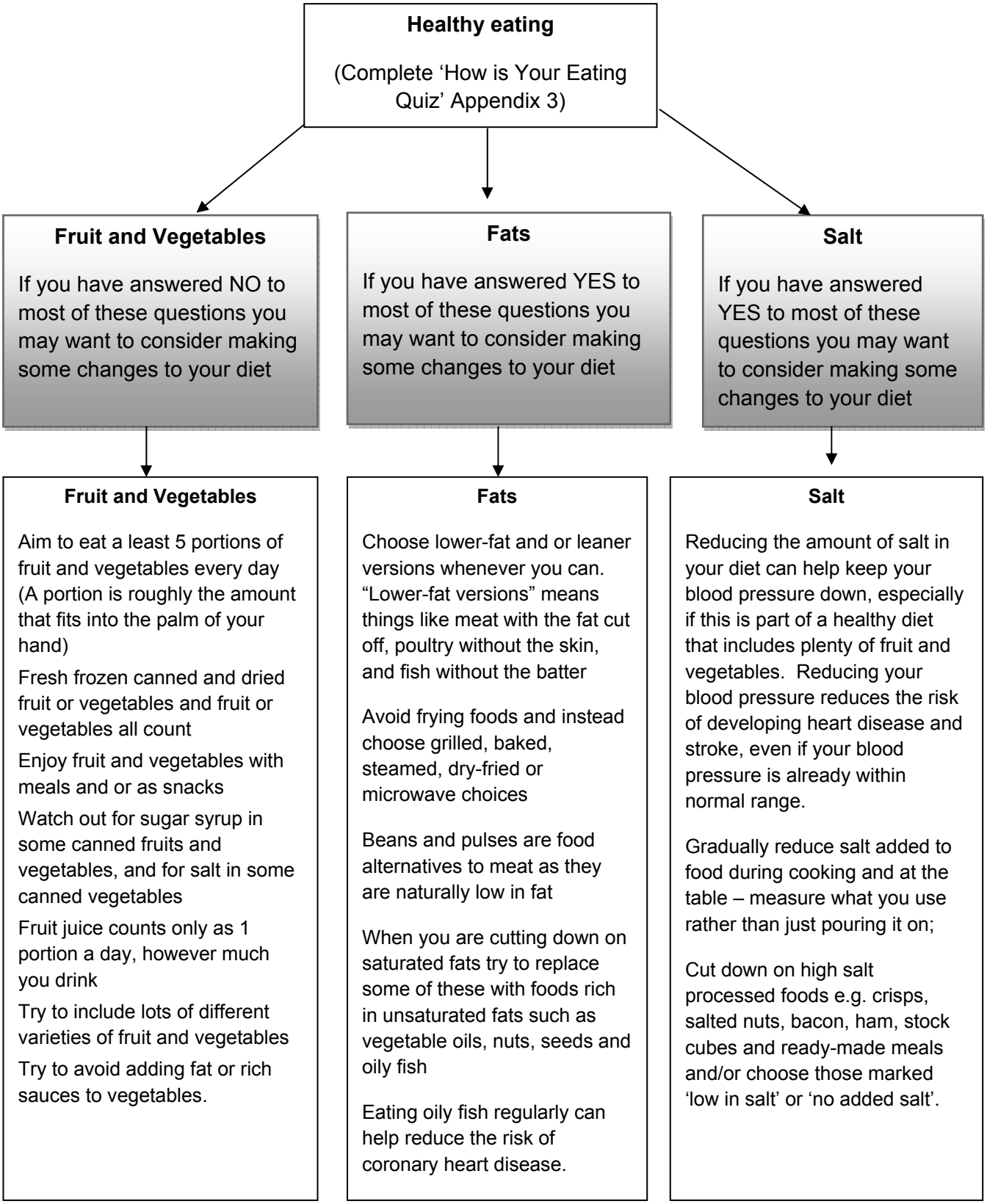
6.3 Physical Activity Brief Intervention & Care Pathway



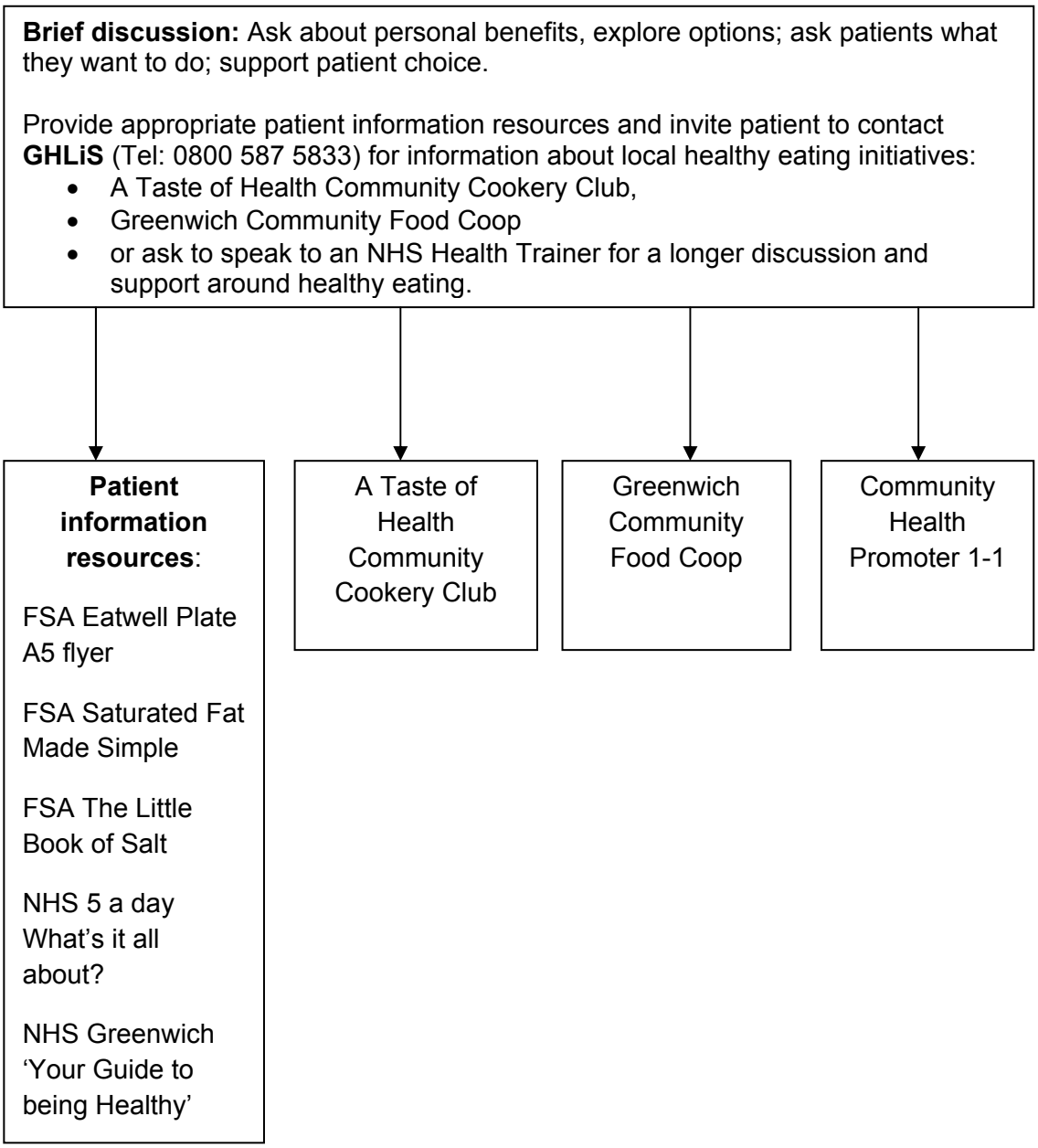
Physical Activity Brief Intervention & Care Pathway (cont.)



6.4 Healthy Eating Brief Intervention & Care Pathway



Healthy Eating Brief Intervention & Care Pathway (cont.)



Also see Diet Questionnaire (Appendix 3)

6.5 Alcohol Brief Intervention and Care Pathway

Everyone should be questioned about the frequency at which they are drinking alcohol. For many people, drinking alcohol with friends and family will be part of their social lives and not be problematic; however, there will be a significant group of people who are drinking at increasing or high risk levels. Brief intervention in the form of advice and information has strong evidence to show it is effective in increasing the number of patients who have reduced their drinking to within lower risk levels. The summarised brief intervention and an example conversation are provided in Table 5 and Table 6 below:

BRIEF ADVICE
ASK and record drinking status
ADVISE patient according to their score/level of drinking Give information about safe drinking limits (use unit calculator wheel and NHS Your drinking and You leaflet). More detailed follow up may be given in separate appointment and paid for in line with alcohol DES. Explore psychological, social, financial and physical benefits of cutting down and contraindications of drinking with existing medical conditions)
ACT on patient's response Build confidence, give information, refer, follow-up, prescribe.

Table 5: Very Brief Intervention

In what ways do you think your drinking can affect your health?

If you regularly exceed the Department of Health recommended daily intake for alcohol (3-4 units for men, 2-3 units for women) then you significantly increase your risk of conditions such as high blood pressure, CHD (for higher risk range), and some cancers e.g. oesophagus and mouth.

What would be the benefits of reducing your alcohol intake?

If you reduce your consumption; this can have a positive impact on your psychological, social, financial and physical wellbeing.

Table 6: Example conversation

Alcohol Brief Intervention & Care Pathway (cont.)

ASK

Questions	0	1	2	3	4	Score
How often do you have a drink that contains alcohol	Never	Monthly or less	2-4 X per month	2-3 X per week	4+ X per week	
How many units do you have on a typical day when you are drinking	1-2	3-4	5-6	7-9	10+	
In the last 6 months, how often have you had more than 6 units on any one occasion if female, or more than 8 units if male	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
Total Score						

0-7: Lower Risk Drinking

8-15: Increasing Risk Drinking

16-19 High Risk Drinking

20+: Possible Dependence

ADVISE & ACT

Congratulate Patient and Inform them that:

- No corrective action required
- What the lower risk limits for regular drinking are
- To maintain this pattern

Make separate appointment and (in line with DES) provide brief intervention to discuss:

- What are lower risk drinking levels
- That patient is already at increasing risk
- What are the health risks
- The potential benefits of cutting down
- Some suggestions/tips for cutting down
- Give leaflet below

Make separate appointment and (in line with DES) provide brief intervention to discuss:

- What are lower risk drinking levels
- That patient is already at higher risk
- What are the health risks
- The potential benefits of cutting down
- Some suggestions/tips for cutting down
- Options for added support if necessary
- Give leaflet below

Greenwich Addiction Service – GAS; 821 Woolwich Road, Charlton. 020 8319 5357
Care management service for drug and alcohol users, refer here if support needed for inpatient detox, residential rehab, the alcohol support group or brief counselling sessions

CRi Primary Care Drug & Alcohol Service- Triage and referral
821 Woolwich Road. 020 8316 0116.

6.6 Section 6: References

[1] Obesity: guidance on the prevention, identification, assessment and management of overweight and obesity in adults and children. NICE guideline CG43. December 2006

Section 7: Management of Clinical Risk Factors by GP Practice Team

7.1 Hypertension Risk Assessment & Management

Please refer to NICE Hypertension Clinical Guidelines 34 (2006) guidelines[1]

Refer also to your practice based hypertension protocols.

Threshold: 140/90mmHg. If the individual has a blood pressure at, or above, 140/90mmHg, or where the SBP or DBP exceeds 140mmHg or 90mmHg respectively, the individual requires a referral for assessment for hypertension by the GP practice team.

7.1.1 Assessment for hypertension

To identify hypertension (persistent raised blood pressure, above 140/90mmHg), ask the patient to return for at least two more appointments; check blood pressure twice on each occasion, under the best conditions available.

Related stages of the check: Individuals diagnosed with hypertension should be added to the hypertension register and treated through existing care pathways. They should be reviewed in line with existing NICE clinical guidelines and should not be recalled as part of the NHS Health Check programme.

7.1.2 Management of hypertension

The NICE Hypertension Clinical Guidelines are summarised in the figure 4 below.

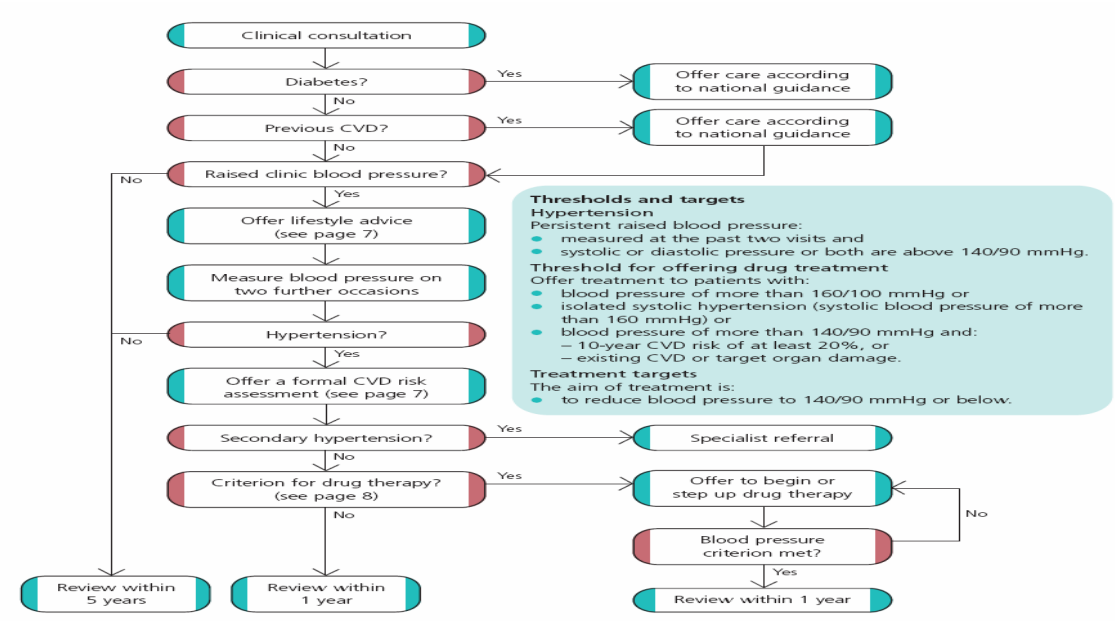


Figure 4: NICE CG 34 (2006) Care Pathway for Hypertension

7.1.3 Interventions for patients diagnosed with hypertension

Offer all patients with raised blood pressure the appropriate lifestyle advice, with particular reference to weight reduction, moderate alcohol intake, limiting salt intake and increasing physical activity. Management of raised blood pressure should be in line with current guidelines, and the threshold for therapeutic intervention considered as appropriate. The flow chart in figure 5 below offers advice for medication guidance.

Choosing drugs for patients newly diagnosed with hypertension

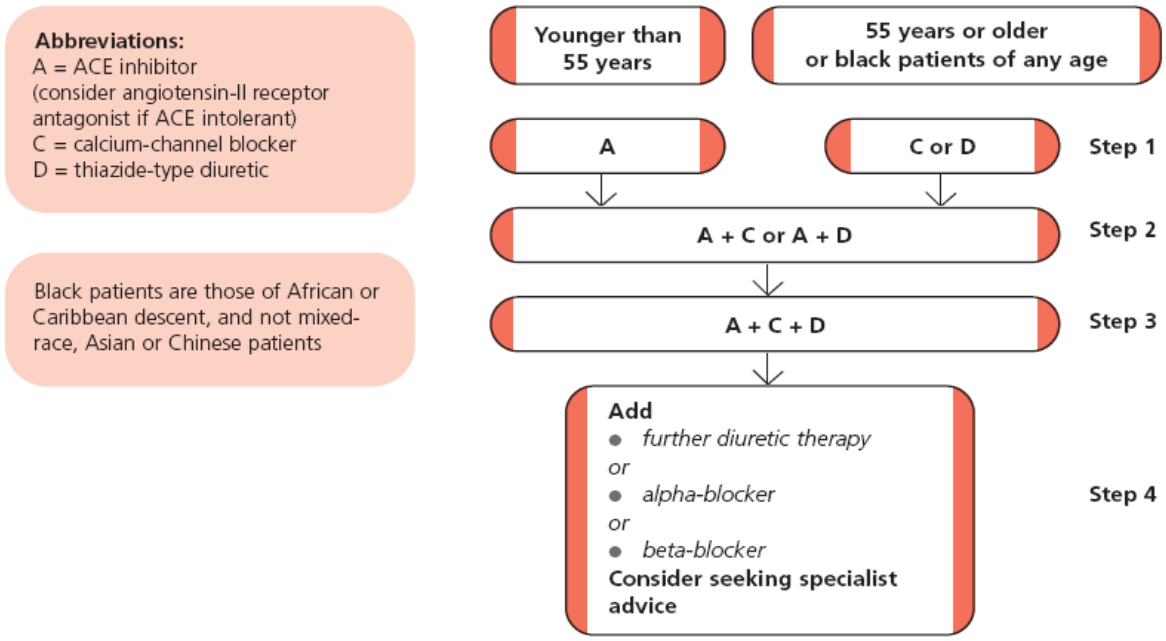


Figure 5: NICE CG 34 (2006) Care Pathway for Hypertension

7.2 Chronic Kidney Disease Risk Assessment

Please refer to NICE CKD Clinical Guidelines 73[2]

Filter Threshold: BP >140/90mmHg.
If the individual has a blood pressure at or above 140/90mmHg, or where the SBP or DBP exceeds 140mmHg or 90mmHg respectively, the individual requires an assessment for chronic kidney disease by a GP.

7.2.1 Assessment for chronic kidney disease

Data required: The results of the serum creatinine test should be used to calculate the estimated glomerular filtration rate (eGFR) in order to assess the level of kidney function, and recorded on the individual's patient record.

7.2.2 Interventions

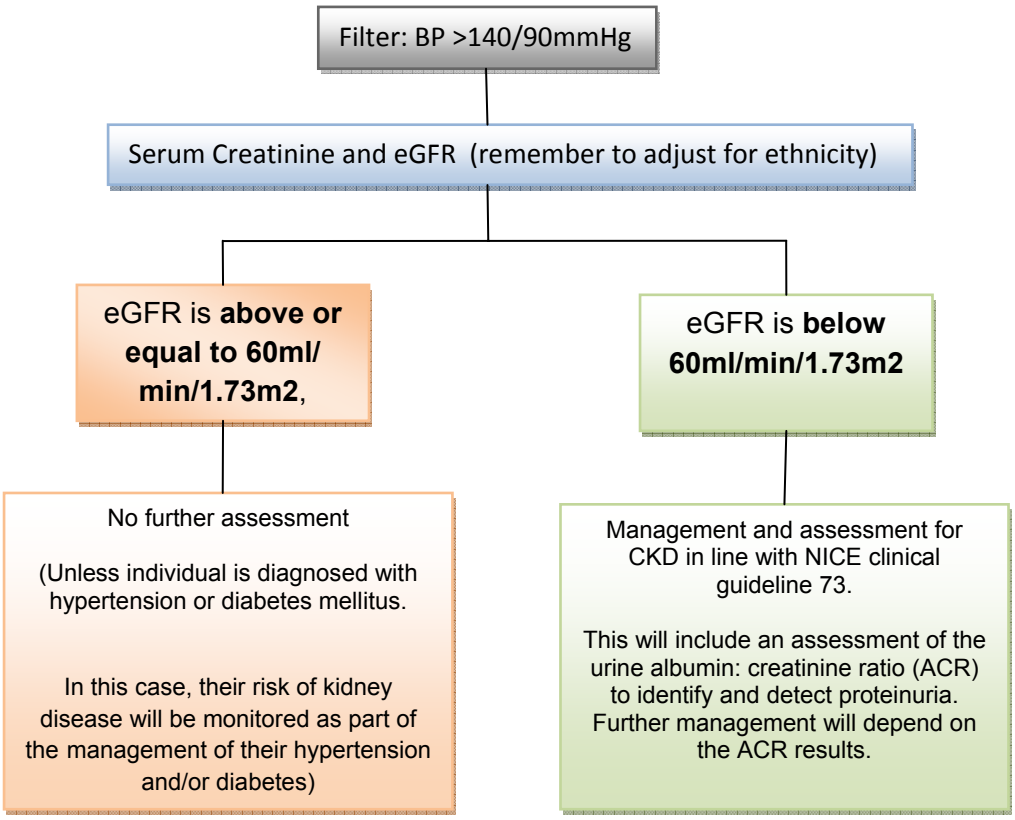


Figure 6: NICE CG73: Care Pathway for CKD

Key points: A venous blood sample is required for this test. NPT is not considered appropriate. A serum creatinine test should be requested from the laboratory.

7.3 Lipid Modification (Primary Prevention)

Please refer to NICE Lipid Modification Clinical Guidelines 67[3]

Refer also to South London Cardiac and Stroke Network (SLCSN) guidelines for Lipid Management (2009) and Statin Prescribing (2008). See Appendix 6 & 7.

Refer also to SLCSN guidance for management of Familial Hyperlipidaemia. See Appendix 8

Threshold: there is no specific threshold for the vascular risk assessment and management programme or for the primary prevention of vascular disease. However if a person's total cholesterol is >7.5mmol it is important to consider Familial Hypercholesterolaemia. See section 7.4 and SLCSN Guidance for Management of Familial Hyperlipidaemia (Appendix 8).

7.3.1 Assessment

Follow the approved SLCSN guidelines on Lipid Modification for assessment and treatment of lipids. Before offering lipid modification therapy, patients should be offered a serum fasting cholesterol, triglycerides, HDL and LDL, as results of the fasting test may, in some cases, drop the individual's previous risk score below 20%. Secondary causes of

hypercholesterolaemia/dyslipidaemia should be excluded. Patients should also be monitored for baseline LFT, CK and TFT (to exclude hypothyroidism). See Table 7.

7.3.2 Interventions

Before offering lipid modification therapy for **primary prevention**, optimise the management of modifiable risk factors if possible e.g. smoking, physical activity and weight.

Initiate statin therapy for patients with CVD Risk ≥20% irrespective of their cholesterol level

NICE recommends Simvastatin: 40mg at night

Where simvastatin 40mg is contraindicated or not tolerated, initiate a lower dose of simvastatin or consider pravastatin as an alternative agent.

There are no target levels for total cholesterol (TC) or LDL for people treated with a statin for primary prevention. All patients prescribed a statin should be advised to report unexplained muscular pain. If this occurs measure their creatine kinase (CK). If unexplained peripheral neuropathy develops consider differential diagnosis and take appropriate action.

At reviews please check that the patient continues to take the statin as prescribed.

Tests	*Lipid profile*	*Liver function*	*CK*	*TFT*	*Comment*
Baseline	•	•	•	•	Fasting sample prior to starting treatment
3 months		•			
1 year		•			Then only repeat again if clinically indicated

Table 7: Monitoring Regime: Statins for primary prevention

7.4 Familial Hypercholesterolaemia Care Pathway

Please refer to NICE Clinical Guideline 71: Familial Hypercholesterolaemia (2008)[4]

Also refer to SLCSN guidance for management of Familial Hyperlipidaemia. See Appendix 8

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.

7.4.1 Assessment

The diagnosis of FH should be confirmed by a specialist in line with the SLCSN FH Pathway. See Appendix 8.

7.4.2 Interventions

Identify and address all modifiable risk factors: Smoking, diet, alcohol intake, BP control and physical activity.

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.

If simvastatin 40mg daily is contraindicated or there are potential drug interactions which limit the dose or 40mg simvastatin is not tolerated, offer an alternative agent, such as atorvastatin 20mg daily.

Notes

- Repeat fasting lipid profile within 3 months and check adherence to therapy
- **In patients not achieving <u>at least</u> a 50% reduction in LDL cholesterol from baseline, consider switching to a high intensity statin, such as atorvastatin 40mg daily, increasing to 80mg daily**
- Consider the addition of ezetimibe if high intensity statin does not deliver the required reduction in LDL cholesterol.
- If at least a 50% reduction in LDL cholesterol is not achieved on high intensity statin at maximal dose (or maximum tolerated dose) in combination with ezetimibe - refer for specialist advice

7.5 Diabetes Risk Assessment & Management

Please refer to South East London Diabetes Filter detailed in Figure 7.

Please refer to Filter Rationale and use of HbA1c for diabetes screening. See Appendix 9.

There is no single accepted way of identifying people who are at risk of diabetes or who have existing undiagnosed diabetes, and discussions are ongoing internationally. There are a number of ways of determining who is at high risk of diabetes, and some of these are set out on page 32 of the UK National Screening Committee's 2008 document "The Handbook for Vascular Risk Assessment, Risk Reduction and Risk Management".[5]

Thresholds

A random HbA_{1c} screening test should be performed on all individuals who meet the diabetes filter criteria, that is, have any of the following:

- BP at, or above, 140/90mmHg or where the SBP or DBP exceeds 140mmHg or 90mmHg respectively
- BMI of 27.5 or over in individuals from the Indian, Pakistani, Bangladeshi, other Asian and Chinese ethnicity categories
- BMI of 30 or over in other ethnicity categories

These thresholds will not pick up everyone at risk of diabetes. It is important to consider the situation of the individual as some people who do not fall into BMI/ BP filter categories will still be at significant risk of Type 2 diabetes. This includes:

- People with first degree relatives with Type 2 diabetes or heart disease
- People with tissue damage known to be associated with diabetes such as retinopathy, kidney disease or neuropathy
- Women with gestational diabetes

- Those with conditions associated with diabetes (e.g. polycystic ovarian syndrome or severe mental health disorders)
- Those on current medication known to be associated with diabetes e.g. corticosteroids

7.5.1 Interventions

HbA1c
Although not yet mainstream practice, the use of HbA1c as a diabetes diagnostic test is currently being debated. It will be the subject of an international consensus document and is likely to become an acceptable alternative diagnostic test in the future. However to date, HbA1c is not yet approved in the UK as a diagnostic tool therefore diagnosis should be made following the current diabetes best practice guidelines using endorsed testing, namely FPG and OGTT.

Low or Moderate Risk of Diabetes (HbA1c < 6%, 42mmol/mol)

- No further testing required
- Advise patient that they are still at high risk of diabetes in the future
- All patients should receive appropriate lifestyle advice and/or clinical management e.g. weight management advice or hypertension assessment
- If patient at CVD risk ≥20% then treat with Statin (See 7.3 lipid modification)

High Risk of Diabetes (HbA1c ≥6%, 42mmol/ml to <6.5% 48mmol/mol) (Non-diabetic hyperglycaemia)

- Advise patient that they are at high risk of diabetes
- Refer for intensive lifestyle management advice (Greenwich Healthy Living Service (GHLiS) and provide appropriate clinical management e.g. hypertension assessment
- Recall in two years and retest blood sugars
- If patient at CVD risk ≥20% then treat with Statin (See 7.3 lipid modification)

Very High Risk of Diabetes (HbA1c >6.5% 48mmol/ml)

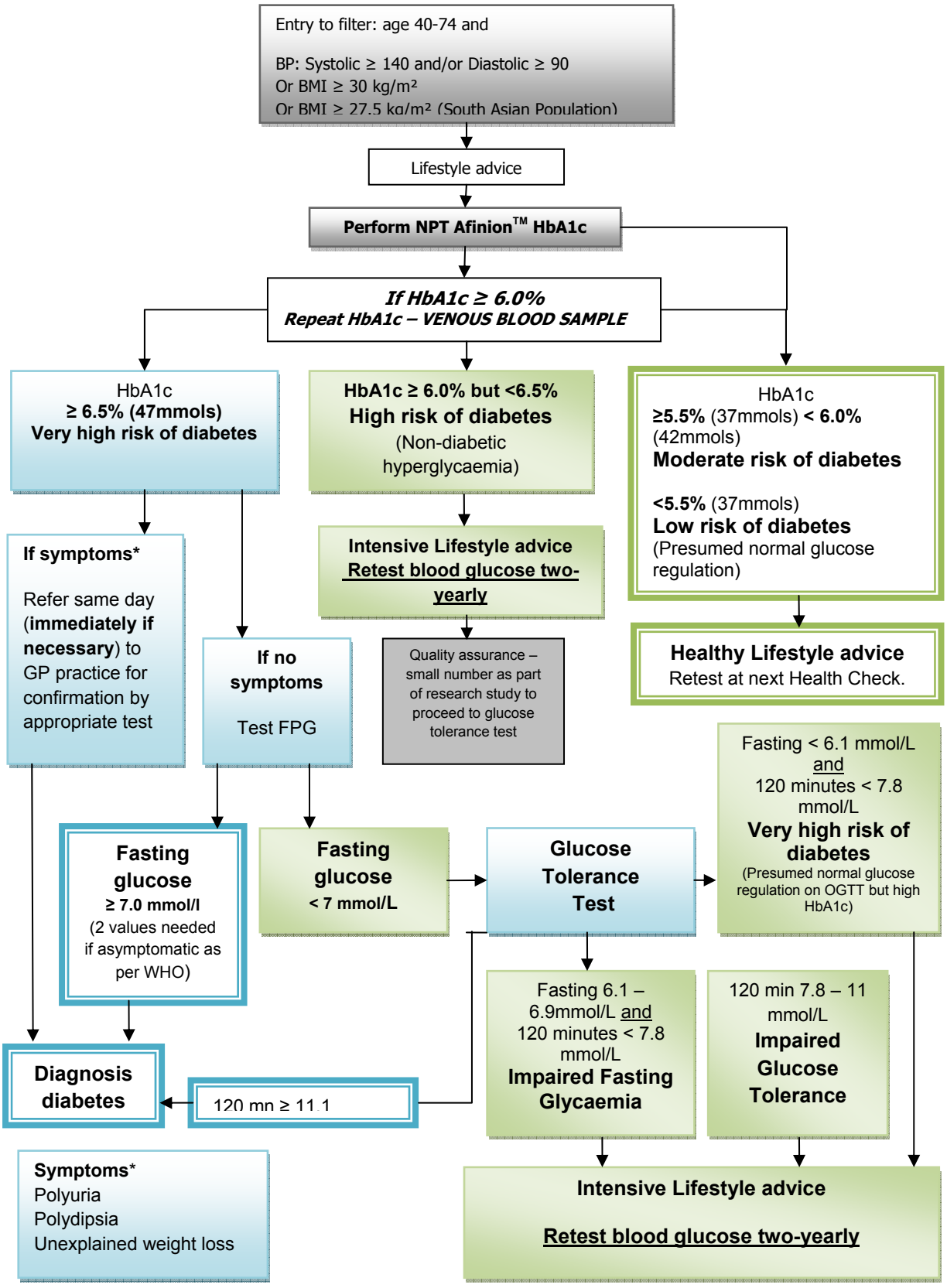
- If symptoms of diabetes are present (extreme tiredness, weight loss, frequent urination (polyuria), excessive thirst (polydipsia), blurred vision and frequent bouts of thrush) diabetes is very likely and this needs to be referred on same day to an appropriate clinician.
- In the absence of symptoms undertake a Fasting Plasma Glucose (FPG**)**

FPG≥7 mmol	Diabetes highly likely, confirm with 2nd test if asymptomatic as per WHO
FPG<7 mmol	Refer for Oral Glucose Tolerance test

- Oral Glucose Tolerance Test (OGTT). All patients should be referred for intensive lifestyle advice to NHS Greenwich Healthy Living Service – **GHLiS** (0800 587 5833) and should be retested two yearly.

Fasting 6.1 – 6.9mmol/L & 120 minutes< 7.8mmol/L	120 min 7.8 – 11 mmol/L	Fasting < 6.1 mmol/L and 120 minutes < 7.8 mmol/L
Impaired Fasting Glycaemia	**Impaired Glucose Tolerance**	**Very high risk of diabetes** (Presumed normal glucose regulation on OGTT but high HbA1c)

Figure 7: South East London NHS Health Check Diabetes filter for Near Patient Testing.



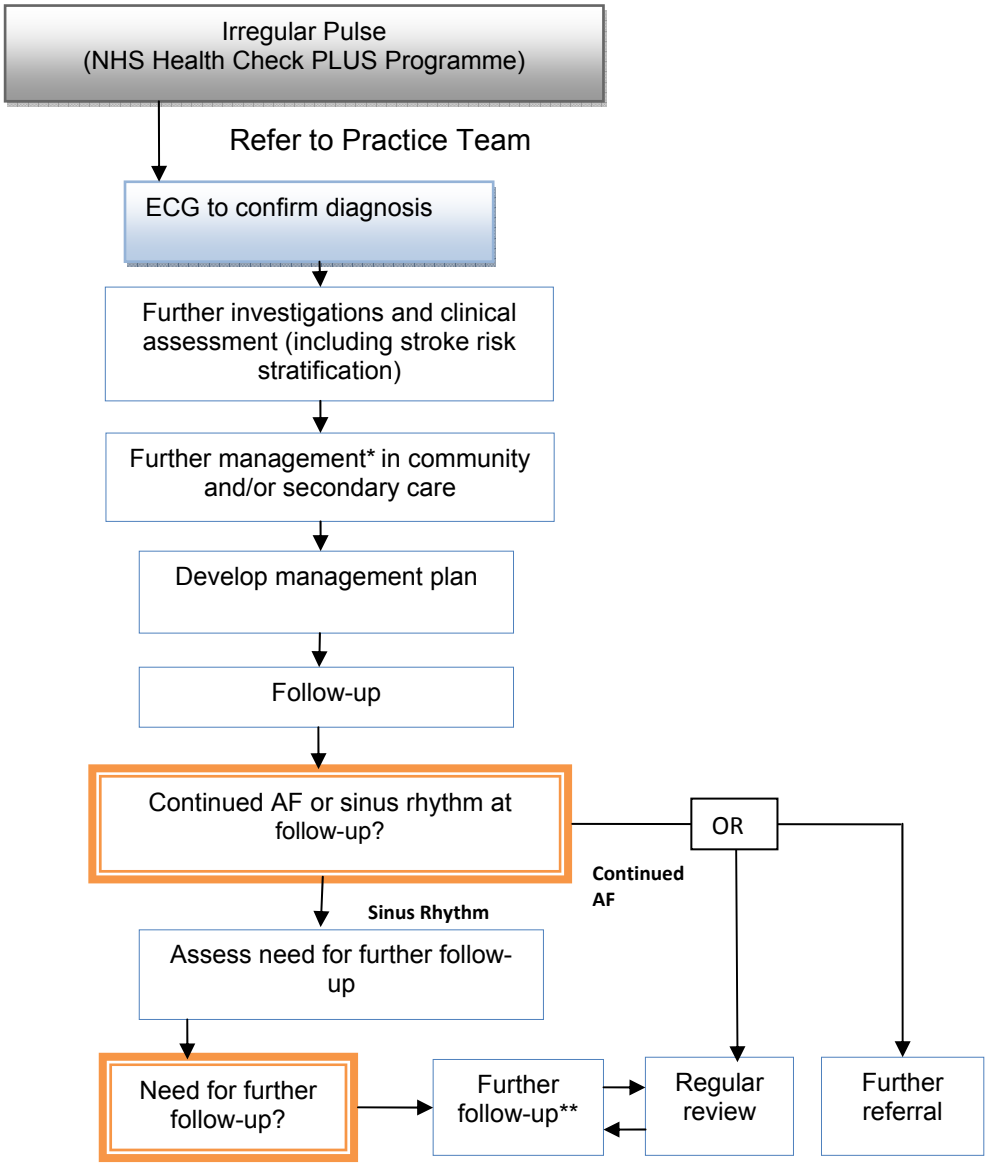
7.6 Atrial Fibrillation Risk Assessment & Management

Please refer to NICE Atrial Fibrillation (AF) clinical guidelines 36. 2006[6]

Thresholds
If an irregular pulse is found at the health check the individual should be advised of the need to see the GP Practice team and a referral made. An ECG will be needed to confirm diagnosis

7.6.1 Interventions

Figure 8 provides an overview of the care pathway set out in NICE AF clinical guidelines 36. 2006.



* Further management to include rate-or-rhythm-control treatment strategy and appropriate therapy based on stroke risk stratification tool
** Further follow up for coexisting conditions and assessment for ongoing implementation

Figure 8: Care pathway for Atrial Fibrillation

7.7 COPD Assessment

Please refer to NICE COPD Guidance CG12[7]

There is evidence that the use of FEV1 and Lung Age (using Fletcher's graph) increases smoking quit rates. As a result of performing this activity on all smokers aged 40-74 as part of the NHS Health Check, it is likely that undiagnosed Chronic Obstructive Pulmonary Disease (COPD) may be picked up.

Thresholds
Where FEV1is <80% predicted, patient should be referred for full Spirometry

Interventions

Figure 9 outlines the care pathway for managing levels of FEV1 predicted.

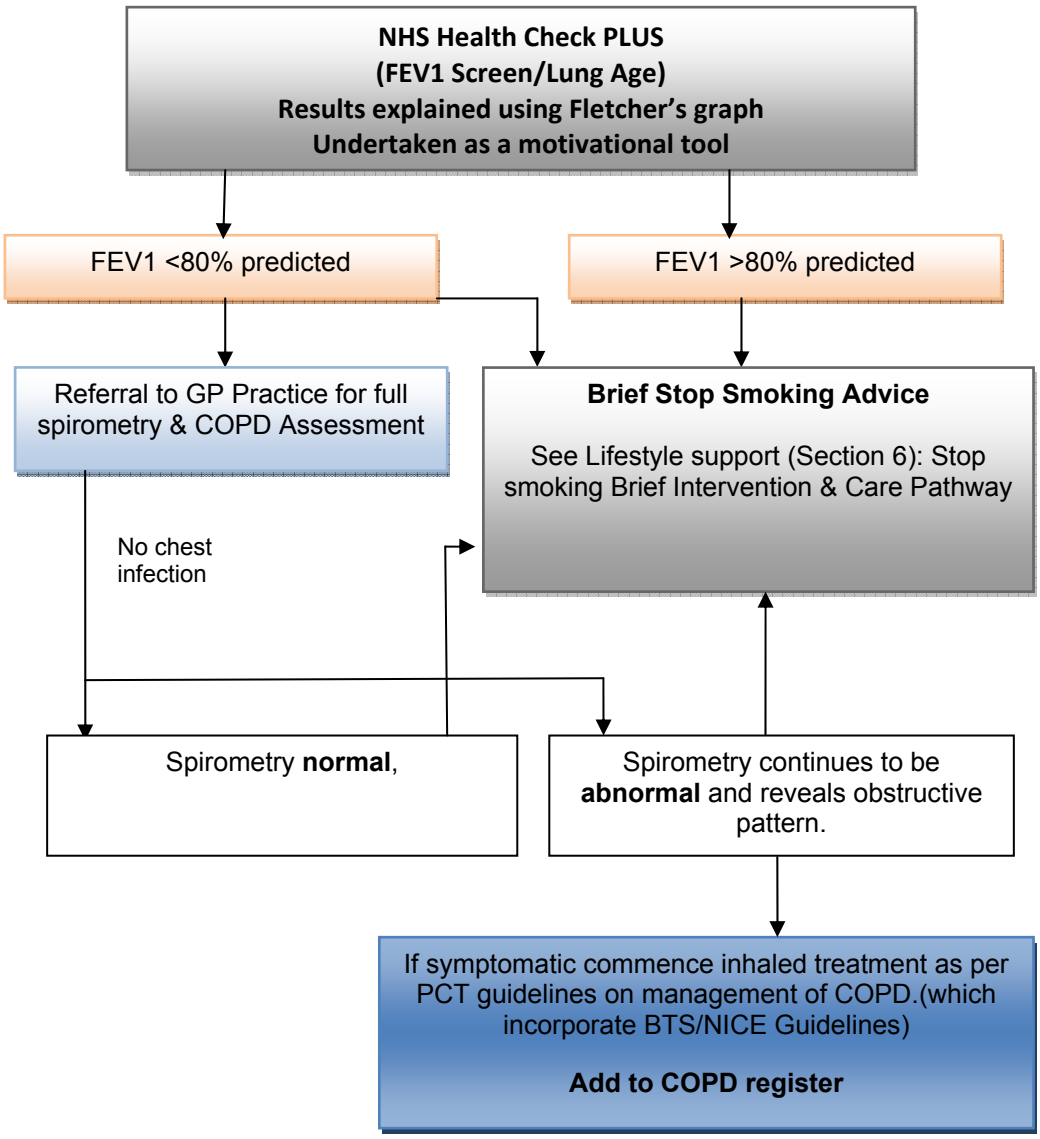


Figure 98: Care Pathway for COPD

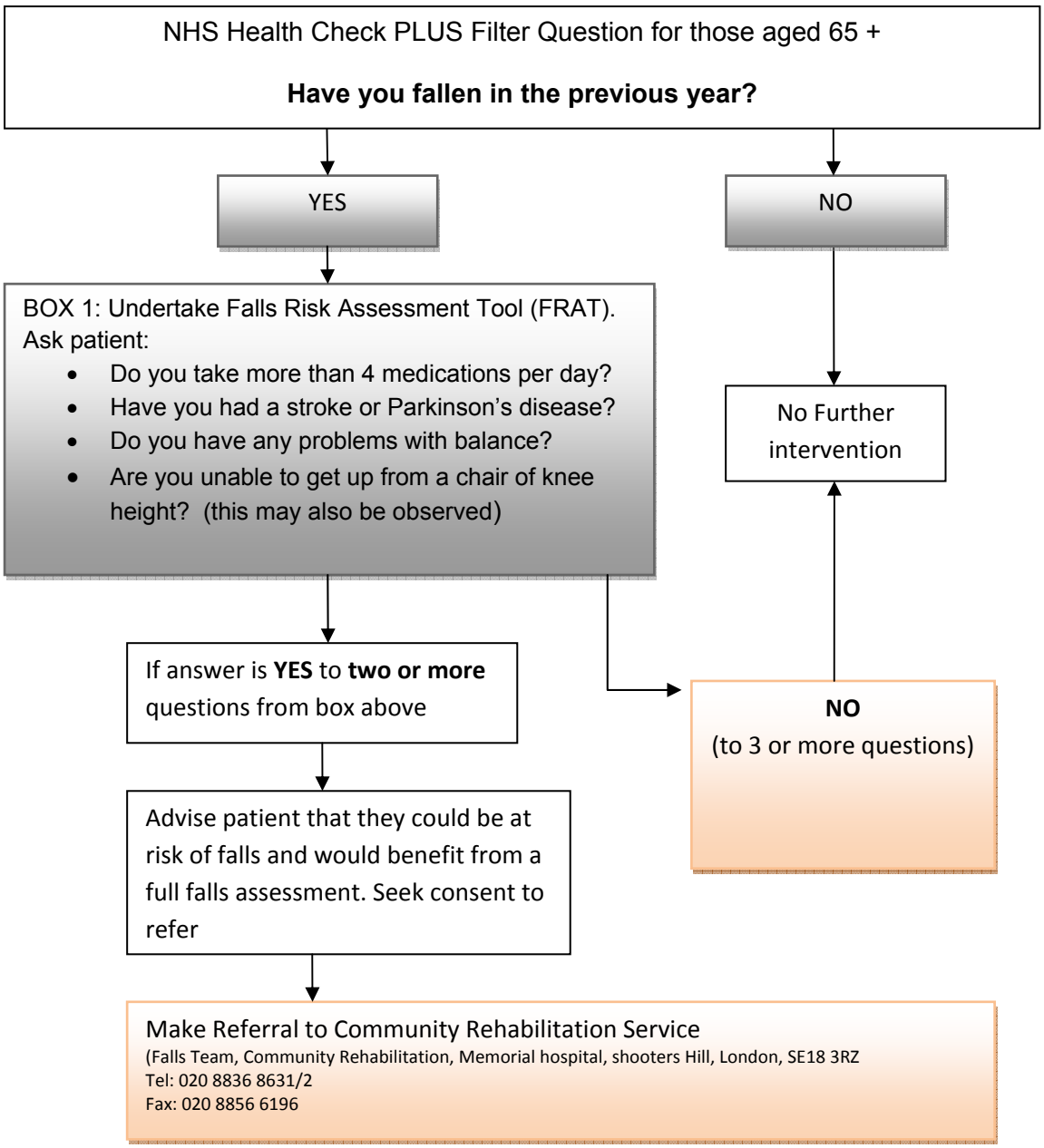
7.8 Section 7: References

[1] Hypertension: management of hypertension in adults in primary care. NICE clinical guideline CG34: quick reference guide. June 2006
[2] Chronic kidney disease: National clinical guideline for early identification and management in adults in primary and secondary care. NICE clinical guideline 73. 24 September 2008. .
[3] Lipid Modification: Cardiovascular risk assessment and the modification of blood lipids for the primary & secondary prevention of cardiovascular disease. NICE Clinical Guideline CG67. May 2008.
[4] Familial Cholesterolaemia. NICE Clinical Guideline CG 71; August 2008
[5] UK National Screening Committee (2008) The Handbook for Vascular Risk Assessment, Risk Reduction and Risk Management
[6] Atrial Fibrillation: The management of Atrial Fibrillation. NICE Clinical Guideline CG36; Quick Reference Guide, June 2006
[7]Chronic Obstructive Pulmonary Disease: Management of chronic obstructive pulmonary disease in adults in primary and secondary care. NICE CG12; February 2004

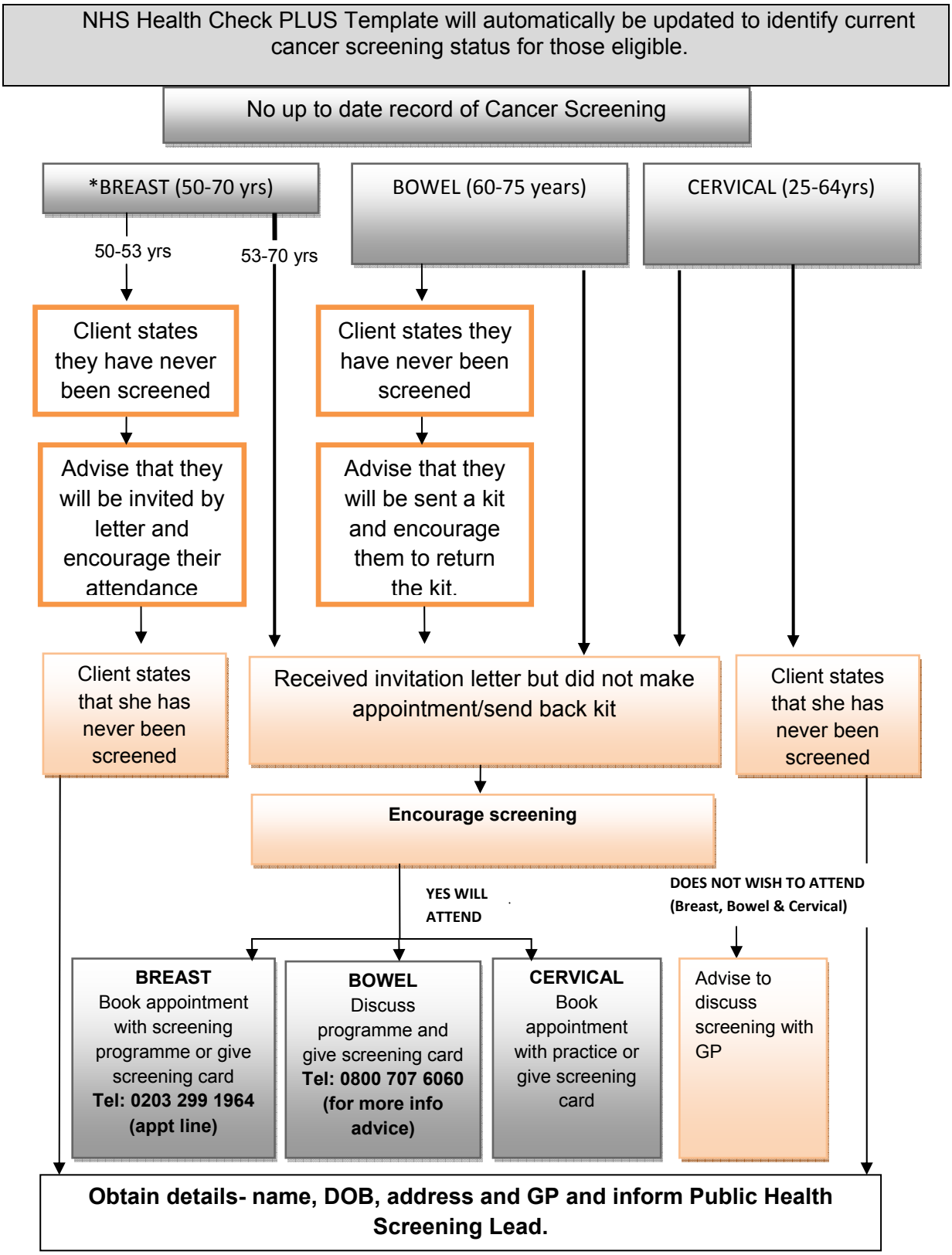
Section 8: PLUS Programme Care Pathways

8.1 Falls Risk Filter and Care Pathway (over 65s only)

Please refer to NICE Falls Guidance CG21.[1]

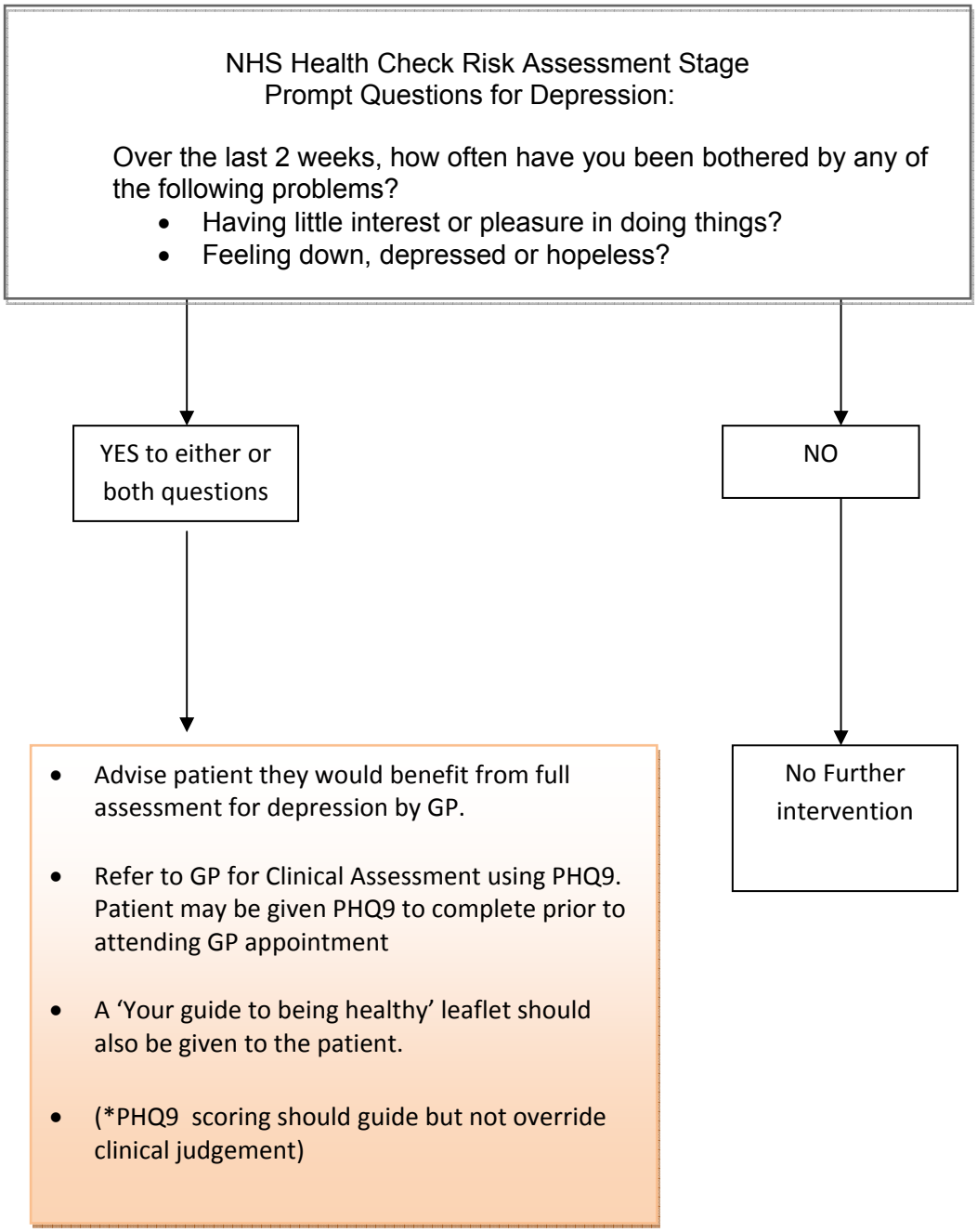


8.2 Cancer Screening Care Pathway



*This will be reviewed as the age extension is rolled out

8.3 Depression Risk Filter and Care Pathway



8.4 Section 8: References

[1] Falls: The assessment and prevention of falls in older people. NICE Clinical Guideline CG21. November 21.

Section 9: Practical Guidance for NHS Health Checks PLUS

9.1 Blood Pressure Measurement

- The practitioner should outline the procedure briefly to the individual; in particular warning them of the minor discomfort caused by inflation and deflation of the cuff.
- The practitioner should explain to the individual that measurement will be repeated three times.
- The practitioner should then ensure the individual is sitting down. Once the client is comfortable the clinician should then ask the client to remove any tight or restrictive clothing from the arm.
- The blood pressure (BP) monitor should be placed on an even flat surface.
- The practitioner should then choose the appropriate size cuff, depending upon the individual's arm circumference, and place it over the brachial artery, just above the antecubital fossa. Having placed the cuff on the patient, it is essential that the bladder of the cuff should encircle at least 80% of the arm (but no more than 100%). If this is not the case, then a more appropriate sized cuff should be utilised as below:

Indication	Width(cm)*=	Length(cm)*=	BHS Guidelines Bladder width & length (cms)*	Arm circ.(cm)*
Small Adult/Child	10 – 12	18 – 24	12 x 18	<23
Standard Adult	12 – 13	23 – 35	12 x 26	<33
Large Adult	12 - 16	35 - 40	12 x 40	<50

**** The range for columns 2 and 3 are derived from recommendations from the British Hypertension Society (BHS), European Hypertension Society (ESH) and the American Heart Association. Columns 4 and 5 are derived from only the BHS guidelines.***

= Bladders of varying sizes are available so a range is provided for each indication (applies to columns 2 and 3)

- The cuff should then be closed with the fabric fastener.
- The practitioner should ensure that the clients' arm is laid on the table with the palm of the arm facing upwards so that the cuff is approximately at heart level.
- The practitioner should ensure the individual's legs are not crossed and ask him/her not to talk whilst their BP is being measured; the clinician should also not talk to the client during the measurement.
- The practitioner should then press the on button then the start button on the BP monitor.
- When the blood pressure monitor has completed (i.e. inflated and deflated) the reading (systolic and diastolic) will appear on the screen.
- The practitioner should record the individual's BP, systolic and diastolic on the NHS Health Check PLUS template.
- If the blood pressure measurement exceeds 140mm/Hg systolic and/or 90mm/Hg diastolic, take a secondary reading after 2-3 minutes and again 2-3 minutes later and take the average of the second and third readings.

9.2 Height Measurement

- Height measurement should not be taken if the individual is immobile and/or does not feel safe standing still, or if the practitioner does not feel safe to support the client whilst they are being measured.
- In measuring for height, the clinician should place the stadiometer against a wall on an even, flat surface; ideally a hard floor.
- The client must be positioned with their feet together, feet flat on the ground and heels touching the back plate of the stadiometer. Their legs must be straight, buttocks against the backboard, scapula wherever possible against the backboard and arms loosely at their side.
- The clinician should then pull down the upper section of the stadiometer until the horizontal pate touches the individual's head.
- The clinician should then make a note of the individual's height in metres and centimetres. This data should then be entered onto the template.
- If the individual requests their height measurement in feet and inches the clinician should use a conversion chart to cross reference the height against metres and centimetres.

9.3 Weight Measurement

- The clinician should not weigh the individual if they are immobile and/or does not feel safe standing still, or if the clinician does not feel safe to support the client whilst they are being measured.
- The clinician should place the scales on an even, flat surface; ideally a hard floor.
- The clinician should then level the scales by adjusting the feet underneath, using the level on the side of the scales as a guide.
- Once the scales turn off the clinician should tap them to turn back on and they should show zero.
- The clinician should ensure both of the individual's feet are in the middle of the scales and that they have let go of anything they may have been holding once they have their balance.
- The clinician should then make a note of the individual's weight in kilograms and grams. This data should then be entered into the template.
- If the client requests their weight measurement in stones and pounds the clinician should use a conversion chart to cross reference the weight against kilograms and grams.

9.4 Waist Measurement

- Use a flexible tape of adequate length
- Remove the individual's clothing from around the waist
- Have the individual stand erect with abdomen relaxed feet 25-30 cm apart, weight evenly distributed, arms loosely at their side
- Find the upper edge of the hip bone (iliac crest) and the lower edge of the lowest rib
- Take the midpoint between the two levels
- Make the measurement horizontally at this midpoint level, whether the umbilicus is above or below (See Diagram 1 below).
- Ask patient to breathe in and then out gently, then take the measurement.
- Healthy limits identified in Table 1

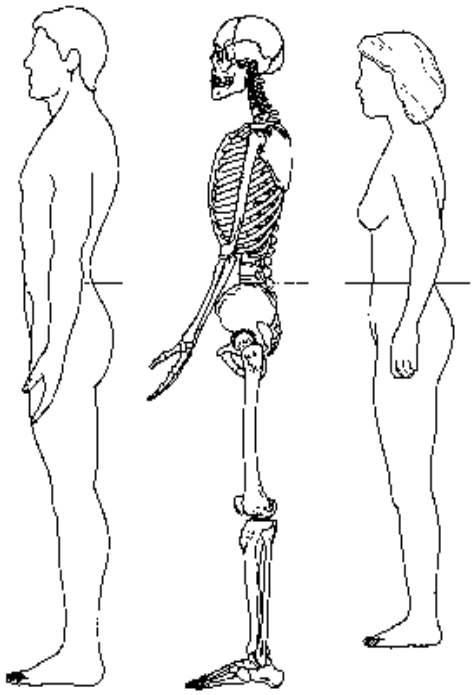


Diagram 1: How to measure waist circumference

	Healthy	Central Obesity
Non Asian Men	<102cm	≥102 cm
Asian Men	< 90cm	≥ 90cm
Non Asian Women	<88cm	≥ 88cm
Asian Women	< 80cm	≥ 80cm

Table 1 WHO Waist Circumference Measurement

9.5 Pulse

- The presence of atrial fibrillation with a pulse that is irregular with respect to rhythm and force of contraction may be identified by checking the pulse on radial side of wrist with tips of index and middle fingers.
- An irregular pulse or a slow pulse should be measured over a longer time. As a guide, it is unwise to measure a regular rate for less than 20 seconds, 30 seconds being preferable and an irregular pulse should not be measured over less than 30 seconds, preferably a full minute.
- An irregular pulse should be referred to the GP Practice Team.

9.6 Performing a Fingerstick Puncture

In order to perform a quality fingerstick puncture the assessing clinician should:

- Ensure the Individual's finger is clean and dry.
- Use one of the middle fingers of the non-writing hand.
- Clean the finger with an alcohol swab, to remove any fats.
- Dry the finger thoroughly with sterile gauze, to wipe off residual alcohol.
- Prepare a single retractable blade lancet.
- Place the finger on the table, to allow the practitioner to press down firmly.
- Perform a deep and firm puncture, in the side of the middle finger approximately 5mm from the edge of the nail; pressing down firmly to ensure a deep enough penetration.
- Dispose of the lancet in the sharps container.
- Create a free flowing drop of blood.
- Wipe off the first large drop of blood, as this may contain tissue fluid and tissue detritus.
- Keeping the patients hand below heart level, squeeze the tip of the finger until a second large drop of blood forms.
- Hold the capillary tube at a slightly descending angle to the drop of blood.
- Touch the capillary tube into the drop of blood and the tube will fill by capillary action.
- If there is not enough blood then the process should be repeated.
- Dispense the blood from the filled capillary tube by pressing down on the black plunger of the LDX Cholestech until the blood is in the cassette.
- Dispose the used capillary tube in the sharps container.

9.7 Performing Cholesterol Test or HBA1c test

These should be performed in line with the manufacturer's instructions.

9.8 Calculating Lung Age

Screening spirometry/Lung Age is targeted at current smokers as a motivational tool to encourage individual's to give up smoking. In order to perform a screening spirometry the practitioner will:

- Enter the gender, age, height in cm and ethnicity into the machine.
- Ask the participant to stand up, take a deep breath in, and then blow into mouth piece hard and fast, to sustain for 1 second when the machine bleeps.
- Take the best of three readings.
- The reading should be interpreted with the visual aid of the Fletcher's graph with lung age (see section 5), emphasising the benefit of smoking cessation.

Appendix 1: Risk Calculator Choice rational: JBS2 (Framingham modified) Over QRISK

There has been extensive and passionate debate on which risk calculator is best to be used for the UK population. The choice of one CVD risk tool over another will always appear to be a subjective decision and subject to criticism. Risk estimation is an imprecise science relying on numerous confounding factors. As Gary S Collins and Douglas G Altman, 2010 note "recent articles are tending to grow in statistical complexity, becoming so increasingly difficult to be understood by general practitioners for whom they are intended"[1]

Risk communication is a fundamental step of the Health Check programme. The JBS2 (based on Framingham) risk tool is extremely patient friendly and, across the sector, is viewed as superior to other risk calculators in supporting risk communication to patients. As age is the strongest CVD risk factor, young individuals at future risk of CVD will only have an increase in their relative risk. The JBS2 risk tool includes a relative risk score where the effect of any intervention on an individual risk profile could be easily and instantly demonstrated and explained (thermometer graphic display).

Furthermore, NHS Greenwich, in the CVD LES 2008, used JBS2 as risk calculator of choice to develop risk registers, therefore there is already familiarity and expertise within practices in its use.
The following provides more detailed technical rationale regarding risk calculator rationale (kindly provided by Dr Eric Cajeat, NHS Lambeth GP).

- **Firstly, the perfect CVD risk calculator should have high sensitivity and low false positive rate and give a CVD risk score with a narrow 95% confidence interval or "true" interval risk value [2] [3].**

A risk calculator equation should have a minimal number of input parameters to reduce statistical calculation errors. Biological measurements are subject to various variations (intra-individual, biological, assay variation, analytical variation) and all measurements are subject to errors. Furthermore, in risk equations each individual risk factor is subject to an exponent with its own confidence interval adding further imprecision. Therefore, even though adding risk factors theoretically increases specificity, "it actually increases error faster, leading to apparently increased sensitivity but significantly reduced specificity" (Wierzbicki, 2009, p992)[4].

Unlike Framingham which uses a limited set of well known and recognised CVD risk factors, and JBS2 which includes risk adjustment for variables such as Triglycerides (TG), family history of CVD and ethnicity, the QRISK2 algorithm includes further additional and novel parameters with very little hindsight for applied coefficients to those novel parameters adding further potential calculation imprecision.

- **Secondly, the perfect CVD risk algorithm should also be calibrated for prevalence of risk factors and underlying rate of CVD events in the population on which it is going to be used and it should also be prospectively validated against this population.**

Framingham relies on complete set of data from epidemiological studies whereas QRISK relies on an incomplete set of primary care databases and the issue of a large number of missing data is part of the controversy (e.g. 72% of individuals had missing cholesterol, 24% a missing blood pressure reading and only 25% had a complete set of data)[5]. QRISK also relies on age and gender based averages for missing data which are then interpolated[6]. Even though this problem was recognised and statistically addressed in the QRISK validation[7] the method used is questioned[8]. It is puzzling that in individuals with recorded lipid values risk was lower than for individuals with missing lipid values.[12] Furthermore, the external validation of QRISK[9] has been questioned in terms of incomplete 10-year prospective follow-up required for 10 years CVD event rates with approximately only 50% of full 10 year follow-up of data.[12]

In terms of prevalence of risk factors and underlying rate of CVD events (endpoints), QRISK relies on the accuracy of primary care cardiovascular and disease registers.

The accuracy of Townsend deprivation score on cardiovascular risk included in QRISK2 is questionable; it is based on old data from 2001 census, and it is unlikely to represent the true underlying causes of inequalities in cardiovascular diseases, and we know from daily experience that large variations exist within a postcode area in terms of social deprivation in our local population.

It is known that Framingham underestimates CVD risk in economically and socially deprived populations[10]. In the absence of both validated and consensual deprivation score for our UK population, and as explained above, rather that adding further imprecision to risk calculation with an added risk coefficient, we should first ensure that our screening strategy does not increase health inequalities in our deprived populations.

Automatic integration of risk calculator within clinical systems (e.g. QRISK2 integrated into EMIS practices) could lead to error by using inappropriate data (e.g. cholesterol value under treatment).

Framingham over-predicts risk in UK population by 30%[11] and QRISK under-predicts risk by 13% for men and 10% for women. The Department of Health estimates that 8% of the vascular checks cohort aged 40-74 years will be identified with a CVD risk ≥20% using QRISK and 13% using Framingham/JBS2[12]. In the context of a screening programme and our local population characteristics using a risk calculator that over-estimates risk rather than under-estimates is more sensible. This view is locally shared[13].

Appendix 1: References

[1] Gary S Collins and Douglas G Altman : An independent and external validation of QRISK2 cardiovascular disease risk score: a prospective open cohort study, BMJ 2010; 340: c2442

[2] Brindle,P.M. & May, M. (2002), The prediction of CHD risk in individuals – an imprecise science (Commentary), International Journal of Epidemiology, 2002;31(4), pp. 822-824.

[3] D'Agostino, R.B., Grundy, S. et al. (2001), Validation of the Framingham CHD prediction scores; results of a multiple Ethnics groups investigation, JAMA, 286(2), PP. 180-187.

[4] Wierzbicki, A.S. (2009), Vascular risk screening: possible or too much too soon?, The International Journal of Clinical Practice, 63(7), pp. 989-996.

[5] Tunstall-Pedoe, H., Woodward, M, & Watt, G. (2009), ASSIGN, QRISK and validation (letter), BMJ, 339:B3514.

[6] Hippisley-Cox, J., Coupland, C. et al. (2007), Derivation and validation of QRISK, anew cardiovascular disease risk score for the United Kingdom: prospective open cohort study, BMJ, 335(7611):136.

[7] Hippisley-Cox, J. Coupland, C et al. (2008) predicting cardiovascular risk in England and Wales:prospective derivation and validation of Q Risk, BMJ, 336:a332

[8] Morrris, R, Peterson, I et al (200(0 Bespoke cohort studies needed (letter) BMJ, 339:b3512

[9] Collins, G. & Altman, D.G. (2009), An independent external validation and evaluation of QRISK cardiovascular risk prediction: a prospective open cohort study, BMJ, 339:B2584.

[10] Brindle, P.M., McConnachie, A. et al (2005), The accuracy of the Framingham risk-score in different socio-economic groups; a prospective study, British Journal of General Practice, 55(520), PP. 838-845.

[11]Wierzbicki, A.S. & Reynolds, T.M. (2009), Vascular risk screening: possible or too much too soon?, The International Journal of Clinical Practice, 63(7), pp. 989-996.

[12]Department of Health (2008), Economic modelling for vascular checks, available at http:/www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_085869

[13] De Sousa, C. & Gostling C. (2009), Guidance on CVD risk assessment tools, Lewisham PCT.

Appendix 2: GP Physical Activity Questionnaire (GPPAQ)

Date…… Name.....

1. Please tell us the type and amount of physical activity involved in your work. Please tick one box that is closest to your present work from the following five possibilities:

Please mark one box only on each row

a	I am not in employment (e.g. retired, retired for health reasons, unemployed, full-time carer etc.)	
b	I spend most of my time at work sitting (such as in an office)	
c	I spend most of my time at work standing or walking. However, my work does not require much intense physical effort (e.g. shop assistant, hairdresser, security guard, childminder, etc.)	
d	My work involves definite physical effort including handling of heavy objects and use of tools (e.g. plumber, electrician, carpenter, cleaner, hospital nurse, gardener, postal delivery workers etc.)	
e	My work involves vigorous physical activity including handling of very heavy objects (e.g. scaffolder, construction worker, refuse collector, etc.)	

2. During the *last week*, how many hours did you spend on each of the following activities?

Please answer whether you are in employment or not

Please mark one box only on each row

		None	**Some but less than 1 hour**	**1 hour but less than 3 hours**	**3 hours or more**
a	Physical exercise such as swimming, jogging, aerobics, football, tennis, gym workout etc.				
b	Cycling, including cycling to work and during leisure time				
c	Walking, including walking to work, shopping, for pleasure etc.				
d	Housework/Childcare				
e	Gardening/DIY				

3. How would you describe your usual walking pace? Please mark one box only.

	Slow pace (i.e. less than 3 mph)		Steady average pace	
	Brisk pace		Fast pace (i.e. over 4mph)	

Hit 'Return' to calculate PAI

How healthy is your eating?

This quiz will help you assess the nutritional value of your diet.

Please answer **Yes** or **No** to the questions below:

Fruit and Vegetables

1. Do you eat at least 5 portions of fruit and/or vegetables every day? ☐Yes ☐ No

A portion is roughly the amount that fits into the palm of your hand. Remember that fruit juice only counts as 1 portion a day, regardless of how much you drink. The same applies to dried fruit. Exclude potatoes as they count as starchy foods

2. Do you eat more than four different varieties of fruit each week? ☐Yes ☐ No

3. Do you eat more than four different varieties of vegetables each week? ☐Yes ☐ No

Fat

4. Do you eat or drink full fat products such as; butter, whole milk, full fat cheese and yoghurt? ☐Yes ☐ No

5. Do you regularly eat food such as; burgers, crisps, chips, fried chicken, pies and sausages? ☐Yes ☐ No

6. Do you regularly eat foods such as biscuits, cakes, chocolate and pastries? ☐Yes ☐ No

Salt

7. Do you regularly add salt to food during cooking or at the table? ☐Yes ☐ No

8. Do you regularly eat savoury snacks such as; crisps, crackers or salted nuts? ☐Yes ☐ No

9. Do you regularly eat processed foods such as; canned soups, ham or bacon, or ready meals? ☐Yes ☐ No

Thank you: Please hand this form back to your healthcare professional.

This quiz has been adapted from an original created by the British Heart Foundation, to whom we are grateful for copyright authorisation (2010-2015).

Fruit and Vegetables

If you have answered **NO** to most of these questions, you may want to consider making some changes to your diet:

Aim to eat a least 5 portions of fruit and vegetables every day (A portion is roughly the amount that fits into the palm of your hand)

- Fresh, frozen, canned and dried fruit or vegetables all count
- Enjoy fruit and vegetables with meals and or as snacks
- Watch out for sugar syrup in some canned fruits and vegetables, and for salt in some canned vegetables
- Fruit juice counts only as 1 portion a day, however much you drink
- Try to include lots of different varieties of fruit and vegetables
- Try to avoid adding fat or rich sauces to vegetables

Eating at least five portions a day will contribute towards reducing the risk of coronary hearth disease. They provide a variety of different vitamins and minerals, as well as being a good source of fibre.

Fat

If you have answered **YES** to most of these questions, you may want to consider making some changes to your diet:

Most people would benefit from eating less saturated fat. This is the type of fat found in many common foods including; meat and dairy products and in many processed foods. Eating too much fat in general may contribute to weight gain, and too much saturated fat can contribute towards coronary heart disease.

Food containing fat should be eaten in moderate amounts:

- Choose lower-fat and or leaner versions whenever you can. “Lower-fat versions” means things like meat with the fat cut off, poultry without the skin, and fish without the batter
- Avoid frying foods and instead choose grilled, baked, steamed, dry-fried or microwave choices
- Beans and pulses are good alternatives to meat as they are naturally low in fat
- When you are cutting down on saturated fats try to replace some of these with foods rich in unsaturated fats such as vegetable oils, nuts, seeds and oily fish
- Eating oily fish regularly can help reduce the risk of coronary heart disease

Salt

If you have answered **YES** to most of these questions, you may want to consider making changes to your diet:

Reducing the amount of salt in your diet can help keep your blood pressure down, especially if this is part of a healthy diet that includes plenty of fruit and vegetables. Reducing your blood pressure reduces the risk of developing heart disease and stroke, even if your blood pressure is already within normal range.

- Gradually reduce salt added to food during cooking and at the table – measure what you use rather than just pouring it on;
- Cut down on high salt processed foods e.g. crisps, salted nuts, bacon, ham, stock cubes and ready-made meals and/or choose those marked ‘low in salt’ or ‘no added salt’.

Appendix 4: Healthwise Inclusion Criteria and contraindications

Inclusion Criteria for Healthwise (Exercise Referral)

All clients for the Exercise Referral scheme must be:

- Over 16
- Greenwich Borough resident
- Not currently active
- Considering or ready to make a change to their physical activity levels i.e. Contemplation, Preparation, or Action stage

And with one or more of the following conditions:

INCLUSION CRITERIA	DEFINITIONS & OTHER RELEVANT INFORMATION
Osteoarthritis	Mild where physical activity will provide symptomatic relief
Stress, Anxiety	Mild to moderate (dependent on medication)
Depression	Mild to moderate
Hyperlipidaemia	≥6.0 mmol/l and/or raised triglycerides
Osteopenia	BMD greater than 1 SD and less than 2.5 SD below young adult mean
Back Pain	After back rehabilitation, referral from hospital Physiotherapist
Surgery (Pre/Post)	General or Orthopaedic (after Consultant/Physiotherapist assessment)
Neurological Conditions	e.g. Young onset Parkinson's disease (stable), Multiple Sclerosis
Fibromylagia	Associated impaired functional ability, poor physical fitness, social isolation, neuroendocrine and autonomic system regulation disorders
Osteoporosis	BMD – 2.5 at spine, hip or forearm or >4 on fracture index with no history of previous low trauma fracture or history of falls
Chronic Fatigue Syndrome	Significantly deconditioned due to longstanding symptoms
>10% CVD risk over next 10 years	Multiple risk factors as identified by Joint British Society 2 guidelines (JBS2)
Family History of Premature CHD	Female <65; Male <55 + two other CVD risk factors
Hypertension	Medication Controlled ≥140-180 SBP and/or ≥ 90-100 DBP
Overweight/Obesity	BMI ≥ 28
Asthma/Respiratory Problems/COPD	Grade 1-2 MRC Dyspnoea scale: 1 – only get breathless with strenuous exercise 2 – short of breath when hurrying on level ground or walking up a slight hill Patients Grade 3-5 MRC to be referred into Pulmonary Rehabilitation for a 4-10 week multidisciplinary

	programme before referral to Exercise Referral Scheme (if appropriate)
Osteoarthritis/Rheumatoid Arthritis	Moderate OA/RA with intermittent Arthritis mobility problems
Stroke/TIA	> 3 months since stroke and < 1 year ago. Stable CV symptoms, no assistance required
Hyperlipidaemia	Elevated total cholesterol to high density lipoprotein (HDL) >6
Type 1 Diabetes	With adequate instructions regarding modification of insulin dosage depending on timing of exercise. Advice given on warning signs and symptoms
Type 2 Diabetes	Lifestyle & medication controlled
Intermittent Claudication/PVD	No symptoms of cardiac dysfunction
Established CHD	Stable Angina, Post MI, CABG, Angioplasty, Transplant, Valve Replacement, Stent, Permanent Pacemaker, Implanted Defibrillator, Heart Failure, (only after Phase III Rehab and stable)

Contraindications (BHF 2008 & BACR 2006)

- Symptomatic severe aortic stenosis
- Acute pulmonary embolus or pulmonary infarction
- Acute myocardiitis or pericarditis
- Suspected or known dissecting aneurysm
- Resting SBP> 180mmHg: DBP>100mmHg
- Uncontrolled/unstable angina
- Acute uncontrolled psychiatric illness
- Osteoporosis (T score >2.5)
- Experiences significant drop in BP during exercise
- Uncontrolled resting tachycardia >100 bpm
- Unstable or acute heart failure
- Uncontrolled diabetes
- New or uncontrolled arrhythmias
- Experiences chest pain, dizziness or excessive breathlessness during exertion
- Febrile illness
- Other rapidly progressing terminal illness
- Acute infections/illness/fever
- Hypertrophic obstructive cardiomyopathy
- Neuromuscular, Musculoskeletal or Rheumatoid disorders that are exacerbated by exercise
- Uncontrolled mental health condition

Appendix 5: Leaflets, Resource Lists and Order Forms

Greenwich Resources Service

The leaflets included in this toolkit can be ordered from Greenwich Resources Service. Simply complete the order form and send it to the Resources Service by fax or post. Alternatively, you can order these leaflets online from our catalogue at www.greenwichresources.nhs.uk.

A leaflet "Your Guide to Being Healthy' has been designed by NHS Greenwich Healthy Living Service to support the NHS Health Checks PLUS programme and provides a range of information and advice on making healthier lifestyle choices.

You will need to register with the service to enable you to order leaflets – you can do this online or by completing the Registration Form in the pack.

Further resources

There is a wealth of further resources available and below we give some recommended leaflets and their sources.

ALCOHOL

Supplier	Title/Description	Cost
Department of Health www.orderline.dh.gov.uk	A range of leaflets and posters - Drinking and blood pressure - Alcohol and stroke - Alcohol pocket guide	Free
Drinkaware www.drinkaware.co.uk	A range of downloadable fact sheets are available from this website	Free

HEALTHY EATING

Supplier	Title/Description	Cost
British Heart Foundation www.bhf.org.uk 0870 600 6566	A range of leaflets about healthy lifestyles and heart health including some in other languages - Eating for your heart - Food should be fun and healthy - Healthy eating for a healthy heart - So you want to lose weight – for good (also available in large print) - Take control of your weight - Saturated fat made simple - Healthy meals healthy heart - Salt – facts for a healthy heart	
Department of Health www.orderline.dh.gov.uk	- Five a day z card	Free
Food Standards Agency www.food.gov.uk	- Eatwell – 8 tips for making healthier choices A range of resources are also available to download.	Free

HEALTHY HEART

Supplier	Title/Description	Cost
British Heart Foundation www.bhf.org.uk 0870 600 6566	A range of leaflets about healthy lifestyles and heart health including some in other languages **-** Take control of your weight - Looking after your heart - Diabetes and how it affects your heart - Blood pressure and how to control it - Cholesterol and what you can do about it - So you want to lose weight – for good (also available in large print) - Women and heart disease	Free
Department of Health www.orderline.dh.gov.uk	Free NHS Health Check – available in Bengali, Gujarati, Hindi, Punjabi, Urdu and Easy Read formats	Free

MENTAL HEALTH

Supplier	Title/Description	Cost
British Heart Foundation www.bhf.org.uk 0870 600 6566	A range of leaflets about healthy lifestyles and heart health including some in other languages **-** Stress and your heart	Free
Mental Health Foundation www.mhf.org.uk	A range of leaflets and downloadable resources about looking after your mental health - How to look after your mental health - How to overcome fear and anxiety - Healthy eating and depression - How to look after your mental health using exercise	Postage charge applies
Time to Change www.time-to-change.co.uk	A range of materials about mental health discrimination	**Free**

PHYSICAL ACTIVITY

Supplier	Title/Description	Cost
British Heart Foundation www.bhf.org.uk 0870 600 6566	A range of leaflets about healthy lifestyles and heart health including some in other languages -Get Active	Free
Greenwich Leisure Limited www.splash.nhs.uk 020 8317 5000	**Healthwise** Information about the Healthwise Physical Activity Referral Scheme	Free
SportEX www.sportex.net	A range of leaflets about Physical Activity and medical conditions: - Physical Activity After a Heart Attack - Physical Activity After a Stroke - Physical Activity and Angina	£18 per 100

	- Physical Activity and Cardiac Rehabilitation - Physical Activity and COPD - Physical Activity and Coronary Heart Disease - Physical Activity and Diabetes - Physical Activity and High Blood Pressure - Physical Activity and Mental Health - Physical Activity and Older Adults - Physical Activity and Smoking Cessation - Physical Activity and Weight Loss - Physical Activity, Diet and Cholesterol - Physical Activity, Health and Wellbeing	

STOP SMOKING

Supplier	Title/Description	Cost
British Heart Foundation www.bhf.org.uk 0870 600 6566	A range of leaflets to help you quit smoking - Smoking and your heart - Smoking and how to give up	Free
GASP www.gasp.org.uk	A range of resources to support your stop smoking work	
QUIT www.quit.org.uk	A range of booklets about smoking and quitting - So you want the truth - So you want to quit - So you want a healthy body - Women and smoking	30p each
Smokefree Smokefree.nhs.uk	A range of resources to help you quit smoking. - Get support DVD - Support guide booklet - Smokefree reward wheel - Today/tomorrow calendar - No chance, get lucky young adults booklet - Tried, try again relapse booklet - Secondhand Smoke kills booklet - Mum's leaflet (pregnancy campaign) - Partner's leaflet (pregnancy campaign)	Free

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Fax: 020 8694 6994 | Website: www.greenwichresources.nhs.uk

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Appendix 6: Prescribing Guidelines: Lipid Management

South London Cardiac and Stroke Networks

Lipid Management for Primary Prevention of Cardiovascular Disease

This guidance represents the consensus view of the South London Cardiac and Stroke Network Cardiac Prescribing Forum.
The guidance does not, however, 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.

Primary prevention is appropriate for patients without known cardiovascular (CV) disease but a calculated CV risk = 20% over the next 10 years

It should not be used for patients with CHD, ischaemic stroke or PVD, diabetes or familial hypercholesterolaemia

Lifestyle Advice and Blood Pressure
The following lifestyle issues should be addressed prior to consideration of 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/m2, 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 (e.g. 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

Initiating Therapy

- **Assessment of global cardiovascular risk is essential before starting lipid-lowering therapy**
- An isolated high total cholesterol without other risk factors may not indicate a need for a statin, except in potential cases of familial hypercholesterolaemia (total cholesterol > 7.5 mmol/L and a family history of CVD) where treatment is essential
- Ideally, cholesterol levels should be measured on two separate occasions and an average of the results used to calculate CV risk. At least one fasting full lipid profile should be taken.
- For patients aged between 40 and 74 years: risk should be calculated using an approved CVD risk calculator, for example, Joint British Societies or other Framingham-based CVD risk tool or QRISK
- Patients of 75 years or over should automatically be considered at high risk, however the decision to treat should take into account individual circumstances
- **Statin therapy should be considered for all patients where CVD risk = 20% over the next 10 years**

First line choice: Simvastatin at a dose of 40mg* with the evening meal.
The dose may be reduced in the event of intolerance.

*Max dose 10mg daily with concomitant ciclosporin, danazol, fibrates or lipid-lowering dose of niacin; max dose 20mg daily with concomitant amiodarone or verapamil; max dose 40mg with concomitant diltiazem

Where simvastatin 40mg is contraindicated or not tolerated, initiate a lower dose of simvastatin or consider pravastatin as an alternative agent

Next Steps

No target lipid levels are routinely recommended for primary prevention

- Patients should be reviewed annually to ensure on-going adherence to therapy - lipid monitoring should be considered to confirm this
- Lifestyle issues should be revisited regularly
- No routine increase in statin therapy beyond simvastatin 40mg daily is recommended in this patient group
- Appropriate safety monitoring should be undertaken – see 'SLCSN Guidance on Prescribing Statin Therapies'
- If statin therapy is contraindicated or not tolerated, consider offering a fibrate, anion exchange resin or ezetimibe as an alternative

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

References

1. NICE Clinical Guideline CG43: Obesity. December 2006
2. NICE Clinical Guideline 66 (2008) Type 2 Diabetes
3. NICE Guidance CG15: Type 1 diabetes in children, young people and adults. July 2004
4. NICE Technology Appraisal 94: Statins for the prevention of cardiovascular events. January 2006
5. NICE Clinical Guideline 67 (2008) Lipid Modification Cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease.

NHS
South London Cardiac and Stroke Networks

Lipid Management for Primary Prevention

This algorithm applies to patients aged 40-74 years with:

- *No known CVD*
- *No known diabetes*
- *No criteria for familial hypercholesterolaemia (total cholesterol > 7.5mmol/L)*

Calculate CV risk using an approved CV risk assessment tool

10 year CVD risk < 20%

Give appropriate lifestyle advice

Ensure regular review of CVD risk in line with local guidance

CVD risk ≥ 20% over next 10 years

Address all other modifiable risk factors: Smoking, diet, alcohol intake, BP control and physical activity

- Offer **SIMVASTATIN 40mg daily**
- If there are potential drug interactions or 40mg simvastatin is contraindicated, offer a lower dose of simvastatin or pravastatin

- No specific treatment targets are recommended for primary prevention
- Patients should be reviewed annually to check on-going compliance with therapy
- Routine safety monitoring should be undertaken in line with SLCSN Guidance on Prescribing Statin Therapies
- Lifestyle issues should be regularly revisited

If statin therapy is contraindicated or not tolerated, consider offering a fibrate, anion exchange resin or ezetimibe as an alternative

Appendix 7: SLCSN Prescribing Guidelines: Statins

Guidance on Prescribing: Statins

The following issues need to be considered when prescribing a statin:

- Identifying patients in whom additional advice should be sought prior to initiation
- Contraindications and cautions
- Drug interactions
- Baseline and follow up monitoring

Seek further advice before initiating statins in patients with:

- Renal impairment (Cr >180µmol/l; CrCl<30ml/min)
- Liver disease (cirrhosis or hepatitis)
- Untreated hypothyroidism

General Contraindications and Cautions

- Hypersensitivity to the individual statin or to any of the excipients
- Active liver disease (AST or ALT level > 100iu/L) or unexplained persistent isolated elevations of serum transaminases
- Statin use is contraindicated in both pregnancy and lactation. Consideration should be given to delaying statin therapy or addressing contraceptive needs in women of child-bearing age
- Concomitant use of fibrates and statins increases the risk of muscle toxicity. Seek specialist advice. The co-administration of statins and nicotinic acid should be used with caution.
- Patients with excess alcohol intake (more than 50 units per week)

SIMVASTATIN (see SPC for full detail)

- In patients with severe renal insufficiency (creatinine clearance < 30 ml/min), dosages above 10 mg/day or should be carefully considered and, if deemed necessary, implemented cautiously.
- Significant drug interactions occur with certain drugs (e.g. amiodarone, verapamil, diltiazem, erythromycin, clarithromycin, itraconazole, ketoconazole, HIV protease inhibitors, nefazodone, ciclosporin). Dose reductions or cessation of therapy may be required – see FAQ / BNF for more details. Consider an alternative agent if necessary
- Advise patients to avoid consumption of grapefruit or grapefruit juice during simvastatin therapy
- International normalised ratio (INR) in patients on warfarin can be affected by concomitant simvastatin use.
- Monitor INR in patients before and more frequently during the early phase of treatment with simvastatin and after any dose changes

ATORVASTATIN (see SPC for full detail)

- For patients with prior haemorrhagic stroke or lacunar infarct the balance of risks and benefits of atorvastatin 80 mg is uncertain and the potential risk of haemorrhagic stroke should be carefully considered before initiating this dose
- For patients on interacting drugs, a lower starting dose may be required and lower maximum doses may need to be considered. Interacting drugs include ciclosporin, clarithromycin, diltiazem, amiodarone and verapamil, itraconazole, protease inhibitors - see BNF/ SPC for more details.

- Concomitant intake of large quantities of grapefruit juice and atorvastatin is not recommended
- International normalised ratio (INR) in patients on warfarin can be affected by concomitant atorvastatin use.
  Monitor INR in patients before and more frequently during the early phase of treatment with atorvastatin and after any dose changes

PRAVASTATIN (see SPC for full detail)

- Caution should be exercised where pravastatin is prescribed for patients treated with erythromycin or clarithromycin
- Start with a dose of 10mg daily in patients with creatinine clearance < 20ml/min.

Monitoring Statin Therapy

Lipid Levels Total cholesterol (TC) High density lipoprotein (HDL) Low density lipoprotein (LDL) Triglycerides	**Primary Prevention:** routine monitoring of lipid levels is not recommended, although clinicians should consider checking lipid levels occasionally throughout treatment to ensure on-going adherence to therapy **Secondary Prevention:** Lipid levels should be measured before therapy is initiated; at 12 weeks following initiation or change of dose and at 12 monthly intervals thereafter If total cholesterol remains persistently raised despite optimising statin therapy – follow local guidance
Thyroid Function Tests	Check before initiating a statin to exclude hypothyroidism
Liver Function Tests (LFTs)	Baseline liver enzymes should be measured before starting a statin. Liver function (transaminases) should be measured within 3 months of starting treatment and at 12 monthly intervals thereafter. If transaminases >3x upper limit of normal (ULN) discontinue statin and refer. For lesser increases in transaminases, which remain elevated at 6 months consider specialist advice
Creatine kinase (CK)	Baseline CK should be measured before starting a statin. Routine CK monitoring after initiation is not recommended. CK should be measured during treatment when clinically indicated – i.e. where there are symptoms of muscle pain or tenderness, muscle weakness or muscle cramps. **Patients should be counselled on initiation of statin to report any usual muscle pain, tenderness or weakness during treatment** **IF MYOSITIS IS PRESENT OR SUSPECTED DISCONTINUE IMMEDIATELY**

	If muscle soreness occurs: • Rule out common causes (e.g. exercise) • Check TFTs (hypothyroidism predisposes to myopathy) • Measure CK - If CK elevated > 5 x ULN stop and seek advice - If CK elevated < 5 x ULN a) Monitor carefully by repeating CK level in one month b) If remains elevated, reduce dose and recheck CK level in one month c) If still remains elevated consider seeking advice • If symptoms continue STOP statin and consult a specialist before re-initiating *Note: Some Black African and Caribbean's have elevated baseline levels of CK. This is not a contra-indication to statin therapy. In these patients, after initiation if the CK > 5 x baseline - seek advice*
Other adverse effects	Headache, dyspepsia or insomnia. Evaluate symptoms at each visit. If symptoms not tolerated: • Consider changing time of dose (after food if nauseous, morning if sleep disturbed) • Consider decreasing dose • Consider using an alternative agent

Agreed by SEL Cardiac Prescribing Forum on 28th Jan 2009 and SWL Cardiac Prescribing Forum on 24th Feb 2009. Review date: April 2011

References

1. Pasternak RC, Smith SC, Bairey-Merz CN, et al., ACC/AHA/NHLBI Clinical Advisory on the Use and Safety of Statins. *Circulation* 2002; 106:1024 – 1028
2. Summary of Product Characteristics for Simvastatin at www.emc.medicines.org.uk (accessed 23/01/2006)
3. NICE Technology Appraisal 94: Statins for the prevention of cardiovascular events. January 2006
4. NICE Technology Appraisal 94: Statins for the prevention of cardiovascular events. January 2006
5. NICE Clinical Guideline 67 (2008) Lipid Modification Cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease.

Appendix 8: SLCSN Guidance for Familial Hypercholesterolaemia

8.1 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 there are drug interactions which limit the dose**, consider an alternative agent, such as atorvastatin 20mg daily initially. ***Max dose 10mg daily with concomitant ciclosporin, danazol, fibrates or lipid-lowering dose of niacin; max dose 20mg daily with concomitant amiodarone or verapamil.* In the event of intolerance to simvastatin 40mg, consider switching to atorvastatin 20mg daily in the first instance.
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 <u>at least</u> a 50% reduction in LDL from baseline. In patients not achieving this on simvastatin 40mg daily, consider switching to a high intensity statin – i.e. atorvastatin 40mg daily, increasing to atorvastatin 80mg daily** ➢ In patients requiring additional LDL lowering despite high 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 high 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, nicotinic

acid, 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 have a formal five year review with specialist advice, in line with SLCSN FH pathway

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

8.2 Management of lipids in Familial Hyperlipidaemia

This algorithm applies only to adults with Familial Hyperlipidaemia

Identify and address all modifiable risk factors:
Smoking, diet, alcohol intake, BP control and physical activity

- **Offer SIMVASTATIN 40mg daily**
- If simvastatin 40mg daily is contraindicated or there are potential drug interactions which limit the dose or 40mg simvastatin is not tolerated, offer an alternative agent, such as atorvastatin 20mg daily

- Repeat fasting lipid profile within 3 months and check adherence to therapy
- **In patients not achieving <u>at least</u> a 50% reduction in LDL cholesterol from baseline, consider switching to a high intensity statin, such as atorvastatin 40mg daily, increasing to 80mg daily**
- Consider the addition of ezetimibe if high intensity statin does not deliver the required reduction in LDL cholesterol.
- If at least a 50% reduction in LDL cholesterol is not achieved on high intensity statin at maximal dose (or maximum tolerated dose) in combination with ezetimibe - refer for specialist advice

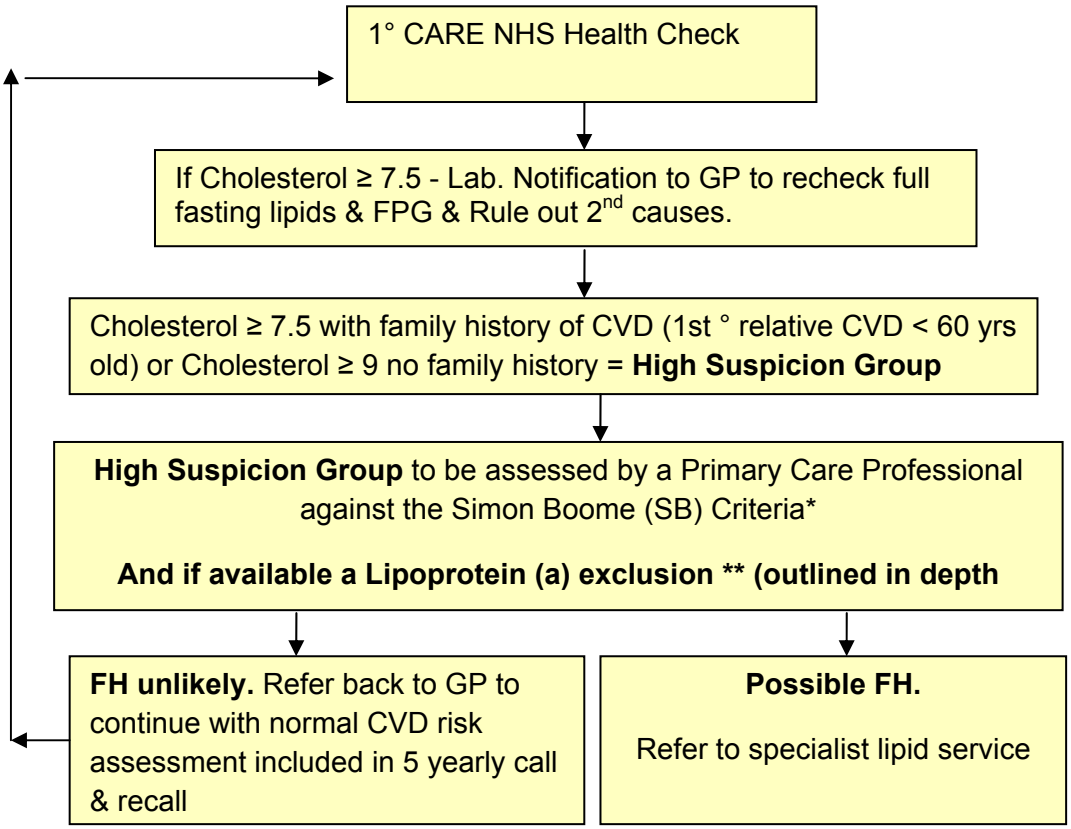
Routine safety and efficacy monitoring should be undertaken – see SLCSN Guidance on Prescribing Statin Therapies

FH patients should be reviewed annually, with lipid monitoring; to check efficacy and on-going adherence to therapy and have a formal five year review with specialist advice, in line with SLCSN FH pathway

Lifestyle issues should be revisited regularly

If statin therapy is contraindicated or not tolerated, consider offering a fibrate, nicotinic acid, anion exchange resin or ezetimibe as an alternative

8.3 Familial Hypercholesterolaemia Pathway for Primary Care Assessment (Adults)



Simon Broome diagnostic criteria for index individuals

Diagnose a person with **definite** FH if they have:

- tendon xanthomas (not arcus or xanthelasma) , **and/or**
- DNA-based evidence of a LDL-receptor, apo B-100, or a PCSK-9 mutation.

Diagnose a person with **possible** FH if they have:

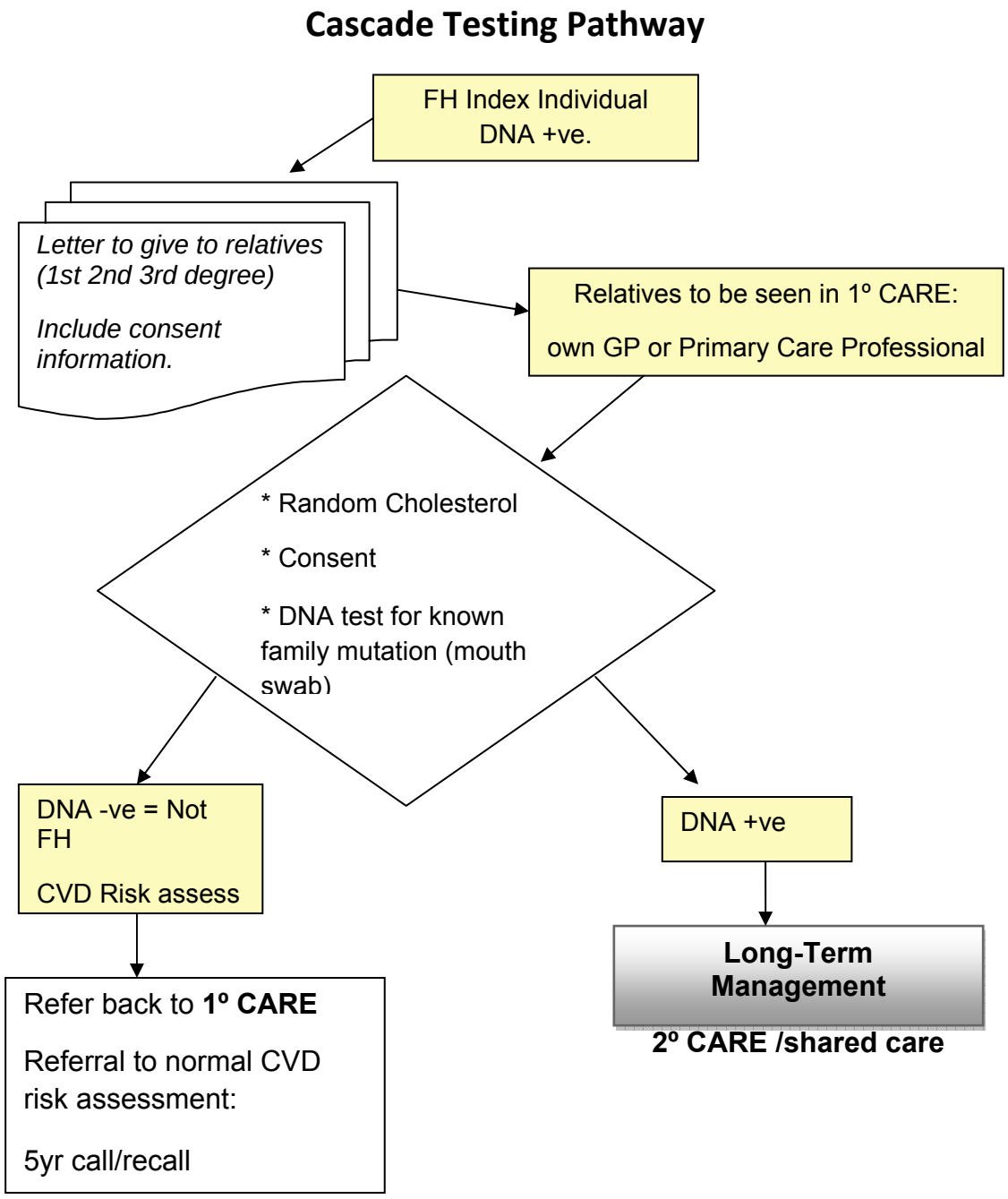
- adult total cholesterol > 7.5 mmol /L **and** at least one of the following;
- Family history of coronary heart disease : age< 60 years in 1st degree relative **or** age <50 years in 2nd degree relative or
- Family history of total cholesterol > 7.5 mmol/l in adult 1st- or 2nd -degree relative (> 6.7 mmol/l in child <16 years).

**** Pg 7 - NICE Quick reference guide - Familial hypercholesterolaemia: August 2008***

** **Lipoprotein (a) tests to track family heart disease**:

- Raised Lp(a) > 0.3 g/L associated with increased inherited risk of CHD, CVA or Peripheral arterial disease (PAD)
- Prognostic factor in patients with FH

8.4 Familial Hypercholesterolemia Cascade Testing Pathway for Primary Care Assessment & Secondary Care Long Term Management (Adults)



8.5 Family screening for Familial Hypercholesterolaemia

Total cholesterol cut offs tables for women & men

women

Age					
0 To 14	15 To 24	25 To 34	35 To 44	45 To 54	55 and Older
8.0	8.0	8.0	8.0	8.0	8.0
7.9	7.9	7.9	7.9	7.9	7.9
7.8	7.8	7.8	7.8	7.8	7.8
7.7	7.7	7.7	7.7	7.7	7.7
7.6	7.6	7.6	7.6	7.6	7.6
7.5	7.5	7.5	7.5	7.5	7.5
7.4	7.4	7.4	7.4	7.4	7.4
7.3	7.3	7.3	7.3	7.3	7.3
7.2	7.2	7.2	7.2	7.2	7.2
7.1	7.1	7.1	7.1	7.1	7.1
7.0	7.0	7.0	7.0	7.0	7.0
6.9	6.9	6.9	6.9	6.9	6.9
6.8	6.8	6.8	6.8	6.8	6.8
6.7	6.7	6.7	6.7	6.7	6.7
6.6	6.6	6.6	6.6	6.6	6.6
6.5	6.5	6.5	6.5	6.5	6.5
6.4	6.4	6.4	6.4	6.4	6.4
6.3	6.3	6.3	6.3	6.3	6.3
6.2	6.2	6.2	6.2	6.2	6.2
6.1	6.1	6.1	6.1	6.1	6.1
6.0	6.0	6.0	6.0	6.0	6.0
5.9	5.9	5.9	5.9	5.9	5.9
5.8	5.8	5.8	5.8	5.8	5.8
5.7	5.7	5.7	5.7	5.7	5.7
5.6	5.6	5.6	5.6	5.6	5.6
5.5	5.5	5.5	5.5	5.5	5.5
5.4	5.4	5.4	5.4	5.4	5.4
5.3	5.3	5.3	5.3	5.3	5.3
5.2	5.2	5.2	5.2	5.2	5.2
5.1	5.1	5.1	5.1	5.1	5.1
5.0	5.0	5.0	5.0	5.0	5.0
4.9	4.9	4.9	4.9	4.9	4.9
4.8	4.8	4.8	4.8	4.8	4.8
4.7	4.7	4.7	4.7	4.7	4.7
4.6	4.6	4.6	4.6	4.6	4.6
4.5	4.5	4.5	4.5	4.5	4.5

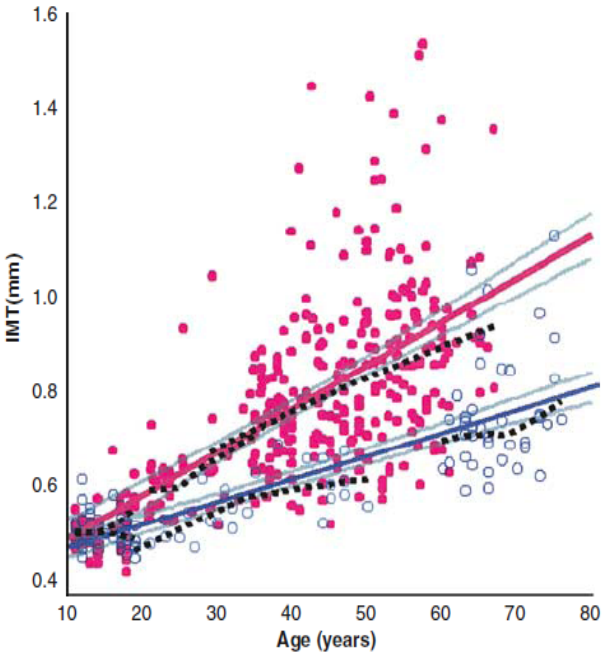
men

Age					
0 To 14	15 To 24	25 To 34	35 To 44	45 To 54	55 and Older
8.0	8.0	8.0	8.0	8.0	8.0
7.9	7.9	7.9	7.9	7.9	7.9
7.8	7.8	7.8	7.8	7.8	7.8
7.7	7.7	7.7	7.7	7.7	7.7
7.6	7.6	7.6	7.6	7.6	7.6
7.5	7.5	7.5	7.5	7.5	7.5
7.4	7.4	7.4	7.4	7.4	7.4
7.3	7.3	7.3	7.3	7.3	7.3
7.2	7.2	7.2	7.2	7.2	7.2
7.1	7.1	7.1	7.1	7.1	7.1
7.0	7.0	7.0	7.0	7.0	7.0
6.9	6.9	6.9	6.9	6.9	6.9
6.8	6.8	6.8	6.8	6.8	6.8
6.7	6.7	6.7	6.7	6.7	6.7
6.6	6.6	6.6	6.6	6.6	6.6
6.5	6.5	6.5	6.5	6.5	6.5
6.4	6.4	6.4	6.4	6.4	6.4
6.3	6.3	6.3	6.3	6.3	6.3
6.2	6.2	6.2	6.2	6.2	6.2
6.1	6.1	6.1	6.1	6.1	6.1
6.0	6.0	6.0	6.0	6.0	6.0
5.9	5.9	5.9	5.9	5.9	5.9
5.8	5.8	5.8	5.8	5.8	5.8
5.7	5.7	5.7	5.7	5.7	5.7
5.6	5.6	5.6	5.6	5.6	5.6
5.5	5.5	5.5	5.5	5.5	5.5
5.4	5.4	5.4	5.4	5.4	5.4
5.3	5.3	5.3	5.3	5.3	5.3
5.2	5.2	5.2	5.2	5.2	5.2
5.1	5.1	5.1	5.1	5.1	5.1
5.0	5.0	5.0	5.0	5.0	5.0
4.9	4.9	4.9	4.9	4.9	4.9
4.8	4.8	4.8	4.8	4.8	4.8
4.7	4.7	4.7	4.7	4.7	4.7
4.6	4.6	4.6	4.6	4.6	4.6
4.5	4.5	4.5	4.5	4.5	4.5

KEY: Red= positive: Grey= uncertain: Green = negative:

Carotid IMT in patients with FH (red) and controls (blue)

De Groot et al : Circulation 2004; 109 suppl 3: 33-8



Appendix 9: Filter Rationale and use of HbA1c for Diabetes Screening

Filter Rationale and use of HbA1c for diabetes screening:

Courtesy of Dr Eric Cajeat, Lambeth GP, Lambeth Resource Kit

- **Terminology** [1,2,3]

  - **Sensitivity:** is the fraction of individuals above a test cut-off who have the disease. A highly sensitive test is unlikely to miss an individual with diabetes (high sensitivity = low false negative rate, sensitivity rate + false negative rate = 100%
  - **Specificity:** is the fraction of individuals below a test cut –off who do not have the disease. A highly specific test is unlikely to misclassify an individual who does not have diabetes as having diabetes (high specificity = low false positive rate, specificity rate + false positive rate = 100%).
  - **Cut-off points:** are always an arbitrary decision, balancing sensitivity and specificity, as increasing sensitivity decreases specificity. The Receiver Operator Curve (ROC curve) is the graphic expression of this relationship. It is used to determinate the discrimination power of a test (high when the area under curve) and the best cut-off which should have a high sensitivity and a preserved high specificity.
  - Generally, in a screening setting sensitivity is favoured over specificity. As a result, a good screening cut-off will be lower than in a diagnostic setting and this will result in a loss in specificity. Therefore the "perfect" screening cut-off will have a high sensitivity with the smallest possible reduction in specificity.
  - **Test reproducibility:** ability of obtaining the same result on repeated measurements on an individual.
  - **Predictive value:** probability for an individual to have or not have the disease given the result of a test.
    - **Positive Predictive Value (PPV):** probability of the disease in an individual with a positive test.
    - **Negative Predictive Value (NPV):** probability of the absence of the disease in an individual with a negative test.

    The predictive value of a test is influence by the prevalence of a disease: a highly specific test will have a greater PPV with high disease prevalence. Selective screening of an at-risk population will increase the PPV of a test.

- Different tests are available for assessing glycaemic regulation, mainly fasting plasma glucose (FGP), random plasma glucose (RPG), oral glucose tolerance test (OGTT) and HbA1c. However, no single test reflects the full extent of an individual glycaemic regulation, each test reflecting a specific aspect of it. All tests have their own limitations: no test is perfect! There is therefore *"no single universally recognised way of testing blood for diabetes or for those at high risk of diabetes"* [4] (DH, 2009, page 19) and this field is rapidly evolving with major changes to come in the way we diagnose and screen for diabetes in the future

- **Fasting plasma glucose (FPG):**
  - There is a significant day to day intra-individual variation both in subjects with normal and abnormal glucose regulation, ranging from 5.7 up to 20%[5,6,7,8,9] (depending on protocols and population characteristics), with biological variability (approximately 6%). The 95% confidence interval (CI) of a FPG value is large and a single measurement can result in a substantial misclassification of a subject. The 95% CI

for a FPG of 7mmol/L with a biological variation of 6.9% is 6.1-7.9mmol/L and adding 4% assay variation is 5.7-8.3mmol/L[10] Applying a 95% variability of 14.8% to the current diagnostic cut-off value of ≤ 7 mmol/L means that a subject with a FPG value between 6.0 and 6.9 mmol/L could have a second FPG value above the cut-off.(13)

- A short term (few days or weeks) diet improvement and/or increased exercise can significantly affect a FPG test. [11,12,13] Furthermore, FPG does not strictly correlate with an individual glycaemic regulation. FPG level results from endogenous glucose production and in type 2 diabetes high FPG levels mainly results from non-inhibition of hepatic glucose production secondary to hepatic insulin resistance.[14] However, in early stages, basal insulin secretion is maintained or even increased, the early phase of the prandial insulin response being abnormal.[14,15,16] Therefore many individuals with impaired glucose tolerance are euglycemic during their daily lives and an individual could have diabetes based on a GTT but have a normal FPG.
- FPG has a modest sensitivity[17] with just over 70% of individual with diabetes detected with FPG compared with OGGT (based on estimate prevalence of a US population aged 40-74 years old).[18]
- It is a very inconvenient test for patients and especially when used in a screening setting, requiring an overnight fasting for at least 8 hours.

- **Random Glucose:** is not acceptable for screening both on clinical and cost effectiveness grounds according to DH guidance[4]. It is indeed extremely influenced by food and post-prandial status. Suggested cut-off of ≥6.6mmol/L[19] or ≥7.2mmol/L[7] have a much lower sensitivity and specificity than HbA1c, respectively 76%-77% and 63%-87%, with a large number of false positives and a higher cost as a consequence.[20] A multivariate logistic regression equation has been suggested[14] to improve specificity (96%) but it requires post-prandial time, allowing for timing errors and therefore imprecision and a programme calculator!

- **Oral Glucose Tolerance Test and 2 hours glucose:** reproducibility in classifying patients is poor (overall 50-66%[8]; normal glucose tolerance 91%, IGT 48%, new diabetes 78% [7], mainly due to a high intra individual biological variation (Selvin et al. [7] 16.6% Mooy et al.[7] 12.7-16.4%). OGTT and especially the 2 hours glucose are influenced by peripheral insulin resistance.[21] It also requires the same overnight fasting for at least 8 hours as FPG.

- **HbA1c:**
  - HbA1c concentration depends on glucose blood level and erythrocytes average life span. It reflects the average blood glucose level during the preceding 8 to 12 weeks and is related to both post-prandial and FPG levels.[22]
  - HbA1c has several advantages over FPG.[1,13,22,23,24]
    - now standardised and aligned to the DCCT/UKPDS (Diabetes Control and Complications Trial/UK Prospective Study Assay) whereas glucose measurement is less well standardized,
    - better index of overall glycaemia exposure and risk of long-term complications,
    - substantially less biologic variability (day to day within-person variance): 3.6% (Selvin et al.[6] less than 2% (Little et al . [22] in non diabetic individuals),
    - Substantially less pre-analytic variability,
    - no need for fasting,
    - relatively unaffected by acute changes in glucose levels (e.g. acute illness, stress).

  HbA1c is a good predictor for both micro and macro-vascular complications of diabetes.[35] Epidemiological studies have shown the non-linear relationship between glycaemia and retinopathy prevalence[18] with a marked increase at HbA1c values

between 6.0 and 7.0% and further analysis have concluded that below an HbA1c value of 6.5%, "moderate" retinopathy or specifically diabetic related retinopathy was "virtually nonexistent".[24] For macro-vascular complication the EPIC-Norfolk study[25] showed that in men without diabetes, HbA1c levels continuously predict mortality from causes, cardiovascular and ischaemic heart diseases across the whole population, starting at HbA1c level of 5% which is well below new American diabetes Association (ADA) diagnostic threshold for diabetes (see further down)

- HbA1c limitations[22,23,24,26]
  - Haemoglobin variants can affect HbA1c levels. Homozygous HbSS and HbCC prevent measurement of HbA1c (no chains). Haemoglobin traits with normal red cell turnover such HbAS (sickle cell trait) and HbAC (African populations), HbE (Asian populations), HbD (Indian populations), all interfere with some assay methods but not with HbA1c assay use in our local clinical diagnostic pathology services (GSTT/KCH.
  - **In patients at risk of significant anaemia (Hb < 9g/L) as well as in patients with a splenectomy, the possibility of a false high HbA1c value exists and thus a fasting plasma glucose is preferred.**
  - Ethnicity: In Latinos, Asians and African and/or African-Americans HbA1c concentration appears to be slightly higher (0.4-0.7% greater in African-Americans than Caucasians[13] but the significance is unclear.[24]
  - Increased rates of haemolysis in rheumatoid arthritis or secondary to drugs like antiretroviral, ribavirin and dapsone can reduce levels of HbA1c.
  - HbA1c has a limited sensitivity in detecting mildly raised levels of glycaemia;[18] Bennett at al.(2007)[1] quotes 50% sensitivity for IFG and IGT.

- **Review of HbA1c cut-offs:**
  - Saudek et al. (2008)[13] in a consensus statement, suggested a >6.0% HbA1c cut-off for screening and ≥6.5% for diagnosis of diabetes (confirmed with either a FGP or 2h OGTT). Based on the two National Health and Nutrition Examination Survey (NHANES) data sets, the cut-offs of HbA1c > 6 % and HbA1c ≥ 6.5% respectively yield 63-67% and 42.8-44.3% sensitivity and 97-8% and 99.6-99.6% specificity.
  - Ginde et al (2008)[10] suggested a positive threshold of HbA1c ≥ 6.1% (68% sensitivity, 98% specificity, PPV 50%) and a negative threshold of HbA1c ≤ 5.4% (91% sensitivity, 73% specificity, NPV >99%) excluding therefore diagnosis of diabetes.
  - Bennet et al. (2007)[1] in a systematic review of 9 studies assessed the validity of HbA1c as a screening tool for type 2 diabetes. Compared to OGTT as a gold standard, Bennett concluded that HbA1c and FPG were equally effective. Compared to FPG, HbA1c had a slightly lower sensitivity and slightly high specificity. A cut-off of >6.1% or 6.2% was recommended and the need for population specific cut-offs (ethnic group, age, gender, population prevalence of diabetes) was queried.
  - Waugh et al. (2007) [27] in a Health Technology Assessment (HTA) review for screening for type 2 diabetes suggested that *"an HbA1c of 5.5% might be a suitable cut-off for screening"* (page 24).
  - In light of an International Expert Committee Report (IECR [24] the American Diabetes Association has in I latest guidance (January 2010) [26] not only endorsed HbA1c as a screening test for diabetes but also as a diagnostic test! The ADA guidance is mostly diagnostic orientated with a suggested HbA1c cut-off of ≥ 6.5% confirmed by repeat testing for diagnosis of diabetes (HbA1c, FPG or OGTT). Based on NHANES dataset this cut-off is less sensitive than FPG cut-off of >7mmol/L and identify one-third fewer cases of diabetes but, according to the ADA, this inconvenient outcome should be offset by the greater practicality of using Hba1c as a diagnostic test as opposed to FPG and the resulting increase number of detected cases of diabetes.

For screening the IECR suggests an HbA1c cut-off of ≥6% - <6.5% for identification of individuals at highest risk for progression to diabetes but warms that "*this range should not be considered an absolute threshold at which preventative measures are initiated*" (page 6). This is further discussed.

- **Discussion of filter's entry criterion and cut-offs:**
  - Entry criterion are in line with the HTA suggesting that screening is more cost effective for people aged 40 – 70 years as well as in the hypertensive and obesity subgroups. Other bodies recommend screening for diabetes in hypertensive individuals.[28,29].
  - **Cut-offs:** DH acknowledges that suggested cut-offs "will not pick up everyone at risk of diabetes but this approach achieves a balance between sensitivity and feasibility. Putting more people through to a blood test would identify more people at high risk of diabetes but would increase workload in general practice and laboratories.[4]

    We could argue, based on above published evidences and new ADA guidance, that DH suggested cut-offs in a screening setting are too high, especially considering the filter entry criterion, acting as a "screening process" and therefore selecting a population at much higher risk of diabetes than the overall population. But, such cut-offs yield higher filter specificity (due to the increased expected prevalence) and therefore a low number of false-positive screens. However, this is at a cost of a higher number of false-negative screens.

    This seems acceptable in a disease like type 2 diabetes for the following reasons:
    - absence of early diagnosis and treatment might have little immediate consequences due to slow progression,
    - a false positive result can put an individual through both unnecessary stress and further tests.
    - In the context of the NHS Health Check program, the false negative results will eventually be picked-up at re-screening with disease progression.

    How we advise and intervene on individuals with low/moderate risk of diabetes (HbA1c <6.0%) and high risk of diabetes (HbA1c ≥ 6.0% but <6.5%) will be extremely important. Monitoring results in our local population and eventually adjusting cut-offs in the near future will be also crucial: for example if in most patients with HbA1c ≥ 6.5% diabetes is later diagnosed, then the threshold will have to be lowered.

- **Rationale for diabetes' filter risk stratification:**
  Confusion may arise for both clinicians and patients as the same tests are used for screening, diagnosis and therapeutic monitoring. Communication of the HbA1c screening test result needs to be clear, consistent. Translating thresholds into falsely reassuring category should be avoided.

  We suggest using similar risk stratification to that for cardiovascular risk: low, moderate, high and very high risk of diabetes.

  With this pragmatic approach, we would expect the following benefits:
  - Consistent communication for CVD risk and diabetes risk
  - This approach should facilitate patients' understanding of the importance of and therefore adherence to life-style interventions. Especially for individuals with an HbA1c less than 5.5% (presumed normal glucose regulation) this will avoid communication of a "normal" result or "no" risk of diabetes.

However, some extra caution might be needed for some individuals in the moderate and high risk categories of diabetes:

Risk of diabetes and of CVD are a continuum depending on multiple risk factors: HbA1c level, FPG, response to OGTT and subsequent diagnosis of IGT or IFG, obesity (central or general), sedentary life-style, history of gestational diabetes, family history of diabetes or of premature vascular disease or hypertension, elements of metabolic/insulin resistance syndrome: hypertension, low HDL-C (<1mmol/L for males / <1.3mmol/L for females), high triglycerides (fasting level > 1.7 mmol/L and Ethnicity (Asian/Turkish). **Therefore within the moderate or high risk category some individuals with added risks to their HbA1c level of risk might in fact be at a relatively higher risk than other individuals within the same risk category.**

This is demonstrated by Ginde et al. (2007)[10] who looked at the impact of risk stratification to increase the predictive validity of HbA1c in screening for undiagnosed diabetes in a US population. In the high risk subgroup (defined using a risk score based on a recognized risk factors for diabetes and multivariate logistic regression), prevalence of undiagnosed diabetes was 11.1% compared to 0.44% in the low risk group; a 25 times difference. For HbA1c values from 5.5 to 6.0%, PPV ranged from 17 to 46% compared to 2 to 27%. In other word, for an HbA1c value of 5.6% an individual had a 21% chance of undiagnosed diabetes in the high risk group compared to a 4% chance in the low risk group (using FPG as gold standard test.) And for HbA1c threshold from 6.1 to 6.4%, PPV ranged from 54 to 81% in the high risk group compared to 42 to 54% in the low risk group!

Furthermore, Edelman et al. (2004),[30] in a prospective cohort study (US population, aged 45-64 year old, mainly males, without diabetes and a 3 years follow-up) looked at the utility of HbA1c in predicting diabetes risk (but without considering the contribution of HbA1c over and above recognised risk factors for diabetes). HbA1c predicted diabetes risk better than BMI: individuals with an HbA1c of 5.6-6% and BMI 27.5-30 had a 2.9% annual incidence of diabetes and 4.1% with BMI >30 compared with a overall 2.5% annual incidence of diabetes for baseline HbA1c of 5.6-6% and 6.4% for HbA1c of 6.1-6.5%.

Lastly, 2010 ADA guidance[26] considers the HbA1c range of 5.5-6 *"as the most appropriate level to initiate preventive interventions"* (page S66) with extra-caution in risk communication when HbA1c is ≥ 5.7% and even more with presence of recognised risk factors. The continuum of risk is curvilinear so that as HbA1c rises the *"risk of diabetes rises disproportionately"* (page S66).

- **HbA1c range 6-6.5% and high risk of diabetes:**
  Based on analysis of the NHANES data the ADA considers that HbA1c values of 5.5% to 6.0% most accurately identify individuals with IFG or IGT and quote for HbA1c values of 6.0 to <6.5% a risk of incidence of diabetes more than 10 times higher than for individuals with lower HbA1c levels but, at the same time acknowledge that *"the 6 to <6.5% range fails to identify a substantial number of patients who have IFG and/or IGT"!* [26].

  However, we suggest not to proceed with further testing in this group. At these levels, HbA1c sensitivity is reduced (and low at a level of 6.5%) but specificity is remarkably preserved (see Saudek et al. above in "review of HbA1c cut-off") A high false negative rate between 40 and 60% would be expected if this level is used as a diagnostic criterion. Furthermore HbA1c is insensitive at these levels to identify IGT/IFG.[1,26] Therefore in many cases further testing would be required to properly assess an individuals' glycaemic regulation using an OGTT.

Diabetes screening HTA criterion 10[27] specifies that *"there should be an effective treatment or intervention for patients identified through early detection with evidence of early treatment leading to better outcomes than late treatment"* (page 88). But initial treatment for type 2 diabetes at these levels of HbA1c is unlikely to require pharmacological intervention[18] and like for IGT, IFG and metabolic syndrome it would require intensive lifestyle intervention (diet & exercise), and eventually a statin if CVD rise was ≥ 20%.

One could argue that in terms of therapeutic interventions there is some evidences that some pharmacological treatments (some as yet unlicensed for these uses) are effective in delaying transition for IGT to diabetes especially in those who are overweight or obese.[3] But, criterion 18[27] specifies that *"adequate staffing and facilities for testing, diagnosis treatment and program management should be available prior to the commencement of the screening program"(*page 90). Primary and secondary care diabetes clinics are certainly already under pressure and unlikely to cope with the extra workload in testing these patients (criterion not met according to Waugh et al. (2007).[27]

We therefore suggest communicating a high risk of diabetes to the individual, promoting intensive life-style interventions, addressing CVD risk and other potential risks (e.g. development of hypertension) and retesting blood glucose two-yearly for most patients (see section further "interventions in brief"). During this period patients are unlikely to develop microvasucular complications and their increased risk of macro-vascular complications would have been addressed (see next bullet point down).

Based on Ginde et al. (2007) study,[10] further testing (FPG/OGTT) could be considered for patients with added recognized risk factors especially for those with HbA1c values close to the threshold of <6.5% (In high risk group, PPV from 46 to 81% for HbA1c 6 to 6.4%).

- **High risk of diabetes and IGT: importance of aggressive life-style modifications in term of cardiovascular prevention**

The relationship between CVD risk and glucose levels extends below diabetic threshold: risk of CVD worsen continuously across the spectrum of glucose tolerance categories beginning in the lowest quintiles of normal fasting glucose levels.[31] Compared with a glucose level of 4.2 mmol/L, there is a 30% increase in CVD risk for 120 minutes glucose of 6.1 mmol/L and 58% increase risk for 120 minutes glucose of 7.8 mmo/L.

In the DECODE study,[32] 30 % of men and 44% of women who were diabetic according to OGTT had normal fasting glucose level and had a 50% increase risk for CVD mortality and 100% increase in risk of all cause mortality. IGT predicts mortality from all causes of death, cardiovascular and CHD deaths with a larger number of excess CVD deaths in subjects with IGT and normal fasting levels. For patients with diabetes, CVD risk is better associated with defective glucose tolerance and therefore abnormal postprandial glucose rather than abnormal fasting glucose.

In the FiMonica study[33] after multivariate adjustment risk of CHD, the incidence of CHD was 49% higher in subjects with IGT compared to normal GTT. IGT was an independent risk predictor for incidence of CHD and premature death for CVD and all cause mortality. This was not confounded by development of overt diabetes even after adjustment for other risk factors of increased CVD risk (e.g. age, sex).

In the EPIC-Norfolk study Khaw et al (2001)[25] showed that the rise in cardiovascular events with raising HbA1c started well below the diabetic range. Every 1% increase in HbA1c was associated with a 305 increase in all cause mortality and a 40% increase in

cardiovascular and IHD mortality. HbA1c is described elsewhere as an *"an independent progressive risk factor for cardiovascular event events regardless of diabetes status (ref*).

Recently the ACCORD, ADVANCE and VA Diabetes trials have failed to demonstrate that intensive glycaemic control improved cardiovascular outcomes in patient with established diabetes. Looking at post-hoc analyse of subsets comparison analysis of trial data and based on new insight from the DCCT follow-up study and UKPDS cohort, the ADA, the American College of Cardiology Foundation (ACC) and the America Heart Association (AHA) have in a position statement[34] suggested that in type 2 diabetes, the benefit of intensive glycaemic control is most beneficial in the early years in term of long-term reduction in risk of macrovascular disease.

The Diabetes Prevention Program trial [35] compared the effect of early intensive life-style interventions versus metformin in individuals with IGT. Improvements in cardiovascular risk and glucose tolerance profile were statistically significantly larger in the life-style intervention group.

Preventing onset of diabetes in individuals at high risk of diabetes or with known IGT with intensive life-style intervention should result in positive outcomes in term of long-term reduction of macrovascular complications.

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