

NOTTINGHAM GUIDELINES ON VASCULAR RISK

Aim

The aim of CVD prevention for all high-risk people is to reduce the risk of CVD and its complications, including the need for percutaneous or surgical revascularisation procedures in any arterial territory, and to improve quality of life and life expectancy.

Objectives

- To assist GPs and primary health care teams to identify systematically, people at high risk of CHD, Stroke and Peripheral Vascular Disease.
- To advise on optimal treatment and recommend treatment pathways for primary, secondary and tertiary care
- To advise on referral, sources of further information and support available.

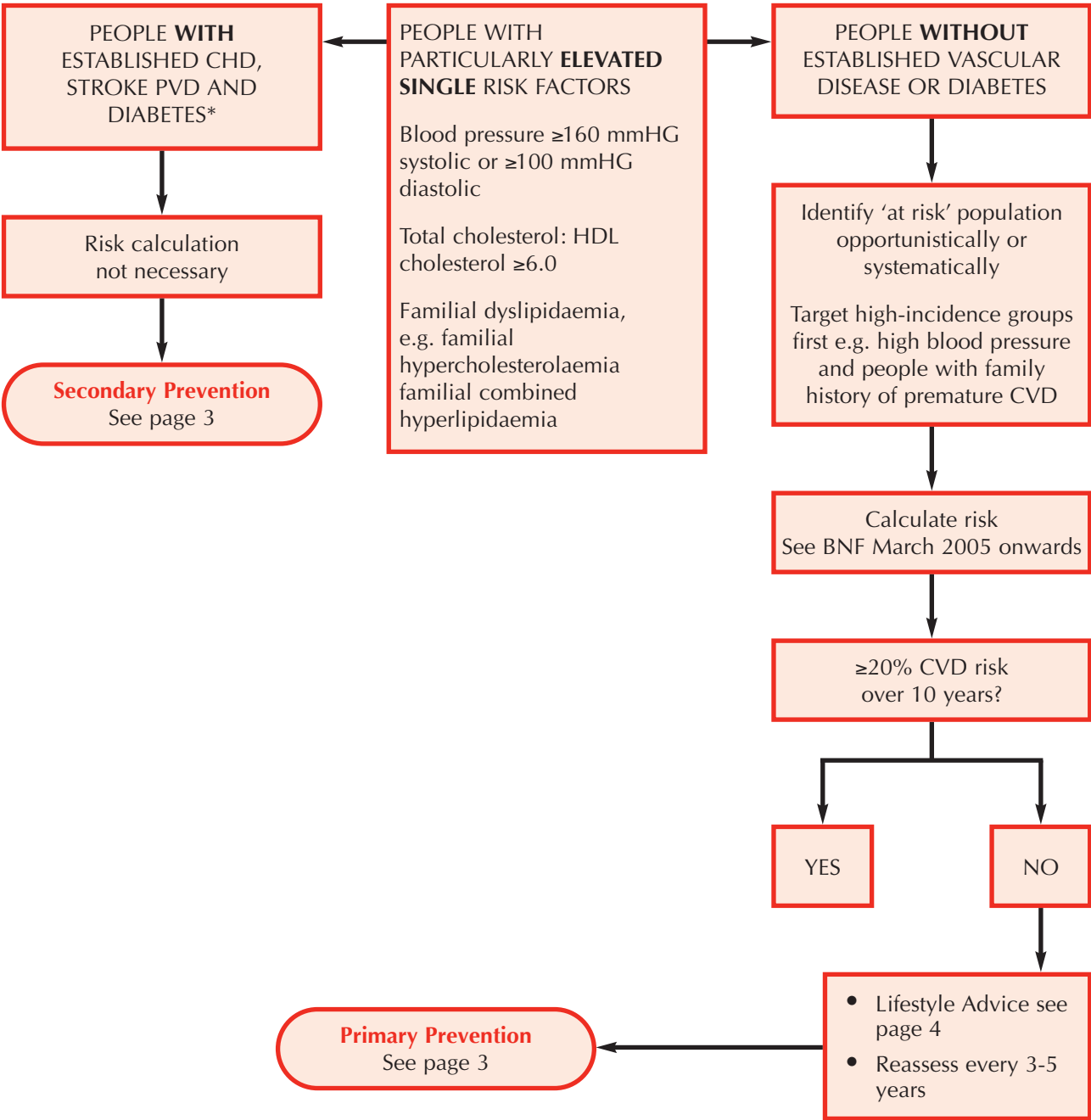
Priorities For Implementation

- People with diagnosed CHD or other occlusive arterial disease – highest priority. Risk calculation is not necessary for these people.
- People >40 years with diabetes (and specified high risk patients <40 years) Risk calculation is not necessary. See '*Nottingham Diabetes Guidelines*' for management recommendations.
- People identified as having an annual risk of Cardiovascular Disease of $\geq 20\%$ over the next 10 years (but who do not currently have diagnosed CVD i.e. primary prevention). Identified by the application of a risk prediction tool.
- People with particularly elevated single risk factors i.e. elevated blood pressure, cholesterol, familial dyslipidaemia, regardless of other risk factors

The evidence for the recommendations in the guidelines is stronger for some than for others: this is a pragmatic guideline based on the best judgement of the development group.

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Risk Assessment



JBS CVD risk prediction chart based on risk factors:

- Age
- Sex
- Smoking
- Total cholesterol/HDL
- Systolic blood pressure

***People with Diabetes**
The exception to this are people <40 years with no other cardiovascular risk factors, who should be risk assessed.

Treatment Overview

Risk - Cardiovascular Disease (CVD) versus Coronary Heart Disease (CHD)

NICE and JBS now recommend that an individual's CVD risk (ie CHD plus stroke risk) should be assessed rather than just their CHD risk.

The recommendation to treat all individuals with a 10 year CVD risk of 20% or more is approximately equivalent to treating those with a 10 year CHD of 15% or more.

Risk Prediction

The recommended Cardiovascular Risk Prediction Charts can be found in the back of the BNF. They are for estimating cardiovascular disease (CVD) risk for individuals who have NOT already developed CHD or other major atherosclerotic disease.

Refer to the explanatory notes on how to use the charts. They also cover when they are not applicable and how to adjust the results for groups where the charts do not reflect the risk accurately.

Primary and Secondary Prevention: Core treatment for all patients

Unless contra-indicated all patients should receive the following interventions:

- advice about how to stop smoking (including NRT/bupropion/New Leaf) - see page 4
- information about other modifiable risk factors and advice on how they can be reduced – see page 4
- advice and treatment to lower and maintain blood pressure - see page 6 for targets
- statins and dietary advice to lower serum cholesterol concentrations - see page 5 for targets
- advice and treatment to achieve and maintain meticulous control of glucose in people who also have diabetes – see Nottingham Diabetes Management Guidelines

Secondary Prevention: Additional treatment

Unless contra-indicated this group should receive the following interventions:

- low dose aspirin (75mg daily)*
- ACE inhibitors for people who also have left ventricular dysfunction
- beta-blockers for at least 2 years for people who have also had a myocardial infarction
- warfarin for people over 60 years who also have atrial fibrillation

Aspirin

Low dose aspirin (75 mg daily) is recommended as follows

Patients with 10 year CVD risk $\geq 20\%$ – if BP $< 150/90$

Patients with Type 2 diabetes ≥ 50 years – if BP $< 150/90$

Patients with Type 2 diabetes < 50 years with additional risk factor(s)

Lifestyle advice – Non-pharmacological interventions

Advice on lifestyle changes is **always** worthwhile, both for primary and secondary prevention. Alone or in combination, these interventions can reduce the need for drug therapy and enhance the effect of drugs used.

Impact of lifestyle interventions on blood pressure	Mean decrease SBP/DBP
Salt – Reducing sodium from 10g to 5g (1tsp) daily. N.B. Soluble painkillers have a high sodium content – a maximum daily dose represents 8g of dietary salt	5/3
Exercise 50 minutes 3 times a week	5/3
7 Portions fruit and vegetables	7/3
Low fat/high fruit and vegetable intake	11/6
Weight loss (per excess kilogram lost)	3/3
Fish Oil (3g/day or more)	4.5/2.5

Advice On Stopping Smoking

Recommended process is to provide information eg leaflets '*Stopping smoking made easier*' (HEA), '*Smoking, giving up for life*' (DOH) or NHS Smoking Helpline 0800 169 0 169, structured support, recommend nicotine replacement therapy or bupropion or refer to specialist smoking cessation service (New Leaf in Nottingham)

Advice On Physical Activity

- General recommendation 30 minutes moderate intensity physical activity on 5 days a week i.e. any activity that leaves you warm and breathing more heavily than usual. Advise people to choose something they enjoy and fits with their life – they are more likely to continue with it.
- Build up gradually if previously inactive, or suffer from breathlessness or angina
- People with raised blood pressure, diabetes, on beta-blockers or other drugs affecting heart rate – additional considerations regarding type of activity, intensity, and precautions.

Dietary Advice

- Hypercholesterolaemia – reduce saturated fatty acids, which raise LDL. Monounsaturated fatty acids lower cholesterol levels. Polyunsaturated fatty acids can lower LDL. Eat oily fish twice weekly.
- Hypertension – is affected by weight loss, avoiding salt, curbing excessive alcohol intake and plenty of fruit and vegetables.
- Obesity – target normally to bring the patient within the normal BMI range but any sustainable weight loss is beneficial and any loss, however small should be encouraged.
- Key recommendations
 - Include at least 5 portions of fruit and vegetables daily
 - Reduce total fat intake. Replace saturated fat with monounsaturated and polyunsaturated fats – check food labels
 - Include 1-2 servings oily fish every week
 - Avoid adding salt at the table or in cooking – avoid processed food with high salt content – check food labels aiming to use foods with a sodium content of <0.3g/100g.
 - Limit alcohol intake – 2-3 units daily (women), 3-4 units daily (men) with 2 alcohol-free days a week.

Referral

Consider referral to Community Nutrition & Dietetic Service - patients with raised blood lipid levels or diabetes who have not responded to initial dietary advice but who are appropriately motivated.

Hyperlipidaemia

Thresholds for Treatment with Statin

Secondary Prevention	Start statin regardless of cholesterol level
Primary Prevention	Start statin in anyone with CVD risk $\geq 20\%$, regardless of cholesterol level
Isolated particularly elevated single risk factor	Total cholesterol to HDL cholesterol ration > 6.0

Target

To reduce cholesterol EITHER to less than 5 mmol/l (LDL-C to below 3 mmol) (OR by 30% whichever is the greater reduction) – see note below

Primary and Secondary Prevention

- Lifestyle advice important – see page 4

Measurement

- Perform fasting lipid profile after three months. Increase dose if necessary.
- Ideally at least two different fasting samples needed for lipid analysis. Ensure patient is fasting (12 hours, water only) and that the request card clearly states 'fasting'.
- Patients seen within 24 hours of onset of an acute ischaemic event – cholesterol may be measured. After 24 hours blood cholesterol unreliable. Wait until 6 weeks after emergency event or elective surgery).

Statins

- There is good evidence for several statins. **Simvastatin 40mg nocte** should be used first line.
- Refer to Nottingham Preferred Prescribing List (PPL) for more detailed advice
- Refer to BNF for side effects and contra-indications

Referral Criteria

- Seek advice if target cholesterol level not achieved, unacceptable side-effects experienced or patients have a severe mixed hyperlipidaemia (fasting triglyceride > 5.0 mmol/L)

Note on targets

Some guidance already indicates that we should be moving towards a 4/2 target rather than the 5/3 target indicated here. There remains a debate about this. NICE have still to complete cost-effectiveness studies. Until national guidance is consistent, the Nottingham Guidelines remain at 5/3. Identifying high risk patients with 20% CVD risk or more over 10 years remains the priority.

Hypertension

Blood Pressure Thresholds To Initiate Treatment

- ≥ 160 systolic or ≥ 100 mmHg diastolic
- ≥ 140 or ≥ 90 mmHg – Patients with established vascular disease e.g. CHD, stroke, PVD, or with a 10 year risk of CVD of 20% or more
- Patients with Diabetes – refer to Nottingham Diabetes Management Guidelines 2006

Target Blood Pressures

Optimal BP	Clinic BP (mm HG)
Uncomplicated Hypertension	<140/<85
Existing Cardiovascular Disease	<130/<80

- Systolic and diastolic should both be attained i.e. <140/85 means less than 140 systolic and less than 85 diastolic
- For mean daytime
- Ambulant BP Monitor or home BP reduce by 10/5
- For diabetics, reduce diastolic target by 5

Investigation

Blood Pressure Measurement

- Follow the British Hypertension Society guidelines on technique
- Use device with validated accuracy, properly maintained and calibrated
- Measure sitting BP routinely: standing BP in elderly or diabetic patients
- Remove tight clothing, support arm at heart level, ensure hand relaxed
- Use cuff of appropriate size (should cover – of upper arm)
- Take two or more measurements at each visit, to ensure reading has settled
- Use the average from 3 separate visits when estimating cardiovascular risk in mild hypertension
- Possible indications for 'home' or ambulatory blood pressure monitoring include the diagnosis of 'white coat hypertension', suspected hypotension, excessive blood pressure variability and resistance to drug therapy

Initial Blood Pressure (mmHg)

Either systolic or diastolic BP may be raised sufficiently to warrant treatment.
Use systolic or diastolic BP, whichever is the more abnormal.

Hypertensive or borderline (i.e. >20% CVD risk) Other routine investigations:

- urine strip test for protein and blood
 - serum creatinine, GFR and electrolytes
 - urine albumin:creatinine
 - blood glucose
 - serum total: HDL cholesterol
 - Baseline ECG recommended for IHD, AF or concern about LVH
- NB an echocardiogram is not required routinely but is valuable to confirm or refute the presence of LVH. (Risk is doubled with LVH)

Initial Evaluation

Consider:

- possible causes of hypertension e.g. Drugs which may raise blood pressure: NSAIDs, oral contraceptives, steroids, liquorice, sympathomimetics ie some cold cures
- complications of hypertension/target organ damage i.e stroke, TIA, LVH (ECG), heart failure myocardial infarct, angina, CABG or angioplasty, peripheral vascular disease, fundal haemorrhages or exudates, proteinuria, renal impairment

Treatment

- Lifestyle advice – see page 4

Indications. Contra-Indications and Cautions

Class of drug	Compelling indications	Possible indications	Caution	Compelling contraindications
Alpha-blockers	Benign prostatic hypertrophy		Postural hypotension, heart failure*	Urinary incontinence Aortic Stenosis (AS)/Hypertrophic Obstructive Cardio- Myopathy (HOCM)
ACE inhibitors	Heart failure, LV dysfunction Post MI or established CHD, Type 1 diabetic nephropathy 2 ^o stroke prevention§	Chronic renal disease [†] Type 2 diabetic nephropathy, Proteinuric renal disease	Renal impairment [†] , PVD∧ AS/HOCM	Pregnancy renovascular disease▼
ARBs	ACE inhibitor intolerance, type 2 diabetic nephropathy, hypertension with LVH, heart failure in ACE intolerant people post-MI	LV dysfunction post-MI, intolerance of other antihypertensive drugs, proteinuric renal disease, chronic renal disease, heart failure [†]	Renal impairment [†] , PVD∧ AS/HOCM	Pregnancy renovascular disease▼
Beta-blockers	MI, angina	Heart Failure**	Heart failure**, PVD, diabetes (except with CHD)	Asthma, COPD, heart block
CCBs (dihydropyridine)	Elderly, ISH, angina CHD	Elderly, angina, MI		AS/HOCM
CCBs (rate limiting)	Reflex tachycardia caused by dihydropyridine-type CCB		Combination with beta blockade	Heart block, heart failure, AS/HOCM
Thiazides, thiazide-like diuretics	Elderly. ISH, heart failure, 2 ^o stroke prevention			Gout* Hyponatraemia

*HF when used as monotherapy; [†]ACE inhibitors or ARBs may be beneficial in chronic renal failure but should only be used with caution, close supervision and specialist advice.∧caution with ACE inhibitors and ARBs in peripheral vascular disease because of the association with renovascular disease; ▼ACE inhibitors and ARBs are sometimes used in people with renovascular disease under specialist supervision;§in combination with a thiazide/thiazide-like diuretic; **Beta-blockers are increasingly used to treat stable heart failure, however beta-blockers may worsen heart failure; *thiazide/thiazide-like diuretics may sometimes be necessary to control BP in people with a history of gout, ideally used in combination with allopurinol.

Logical initial combinations of drugs (ACD mnemonic)

ACD Guideline

	AGE <55	AGE ≥55 or black origin*
STEP 1	A	C or D
STEP 2	A PLUS C or D	
STEP 3	A PLUS C PLUS D	
STEP 4 Resistant HT	Add: *beta-blocker, Doxazosin, Spironolactone, Moxonidine or loop diuretic	

A = ACE inhibitor or ARB if ACE not tolerated

C = once-daily formulated calcium channel blocker

D = low-dose thiazide diuretic

Note 1 – The combination of beta-blocker and thiazide has been associated with an increased risk of diabetes and is best avoided.

Note 2 – Low- dose thiazide is still considered a reasonable first line treatment for those >55years

Note 3 – Refer to Nottingham Preferred Prescribing List for drugs of choice

*black = African or Afro-Caribbean or with one African or Afro-Caribbean parent

Referral Criteria

- Severe hypertension and fundal haemorrhages/papilloedema (medical emergency)
- Patient under 30 or presentation suggests possible secondary hypertension
- Poorly controlled despite concordance/compliance with more than 4 agents
- Adverse Effects on multiple antihypertensive drugs
- Creatinine rises by more than 10% on ACE-inhibitor or ARB
- Possible white-coat hypertension and domiciliary BPs/24hour BP recorder not available

Hypertension Clinics:

Available via Choose & Book

Dr Wayne Sunman, City Hospital Campus, Nottingham University Hospitals (0115 969 1169 Ext 49754)

Prof P Rubin, Prof P Bath at Queen's Medical Centre Campus, Nottingham University Hospitals

Post Myocardial Infarction Secondary Prophylaxis

Secondary Prophylaxis should be tailored to each patient.

In the absence of clear contra-indications, all patients should receive:

- anti-platelet agent
- ACE inhibitor **and** beta-blocker
- invitation to Cardiac Rehabilitation
- smoking cessation, dietary advice and a statin if indicated
- short acting nitrate

Anti-Platelet

- Aspirin 75mg of with food
- Clopidogrel 75mg only if truly aspirin intolerant (See Appendix: Clopidogrel Guidelines)

Ace Inhibitors

- If hypotension after a first dose of an ACE -I, try repeat dose next day
- Titrate to highest tolerated dose
- Under normal circumstances, ACE-Is should be continued for at least 4 years
- Refer to BNF and Nottingham PPL for choice and dosing

Beta-Blockers

- Refer to BNF and Nottingham Preferred Prescribing List for choice and dosing

Cardiac Rehabilitation

Prior to discharge ALL patients should:

- receive British Heart Foundation (or similar) literature
- meet and talk with the CCU staff
- receive an invitation to a cardiac rehabilitation programme
- receive pre-discharge advice including information for family , carer or friends

Dietary Advice And Statins

- Lifestyle advice - see page 4
- Check cholesterol on 1st blood sample (within 24 hours of symptoms) or at 6 week follow up

Short Acting Nitrates

- GTN 500mcg sl prn

Blood Pressure

Aim for BP<130/<80 - see page 6

Stroke

Patients with acute stroke or multiple TIAs should be sent to their nearest hospital immediately.

- Immediate dose of 300mg aspirin unless strong suspicion haemorrhagic* stroke

Patients with a recent minor (non-disabling) stroke or transient ischaemic attack (TIA) should be referred immediately to a local stroke/TIA clinic. (Stroke risk is 8% risk within a week).

In the interim

- unless haemorrhagic* start on 75mg aspirin and dipyridamole MR 200mg bd immediately

- Tests – FBC Lipids, glucose, ECG if possible and send results to clinic

*Haemorrhagic stroke – suggested by headache, change in conscious level, nausea or vomiting, meningism

Prevention Of Stroke Recurrence: Management In Primary Care

Patients who have suffered a stroke remain at an increased risk of a further stroke (between 30 and 43% risk within 5 years. Patients with TIA and stroke also have an increased risk of MI and other vascular events. The risk of stroke is highest early after stroke or TIA.

All Patients	Ischaemic Stroke
<p>Life style advice – see page 4</p> <p>Lowering blood pressure</p> <ul style="list-style-type: none"> • Start >1 week post-stroke • Titrate to reduce blood pressure to <130/<80 mmHg • The choice of drugs should be tailored to the patient. See page 7 • Two or more drugs may be required to achieve control. See page 7 <p>Diabetes mellitus</p> <ul style="list-style-type: none"> • See Nottingham Guidelines on the Management of Diabetes • See page 7 for treatment of hypertension with diabetes 	<p>Antiplatelet therapy</p> <ul style="list-style-type: none"> • For patients not on anticoagulation. • Low dose aspirin (75mg) lifelong and dipyridamole MR (200mg bd) for 2 years • Clopidogrel (75 mg od) – if true aspirin intolerance – see Appx Clopidogrel Guidelines • DipyridamoleMR (200mg bd) long term – if combined aspirin and clopidogrel intolerance <p>Anticoagulation (Usually after specialist referral) See page 12</p> <p>Carotid surgery Carotid endarterectomy:</p> <ul style="list-style-type: none"> • For patients with ipsilateral severe internal carotid artery stenosis (70%-99%) and recent (ideally within 2 weeks and definitely <3 months) non-disabling ischaemic stroke. • Referral should not be delayed while medical management is optimised. <p>Lipids Administer a statin - all patients – see page 5</p> <p>REFERRAL - refer to stroke/TIA clinic</p> <p>Complex cases e.g</p> <ul style="list-style-type: none"> • Recurrent ischaemic stroke/TIA despite first line antiplatelet approach ("treatment failure") • Recurrent embolic events despite adequate anticoagulation with warfarin.)
<p><u>Appropriate clinical investigations</u></p> <p>To determine the nature of the stroke, likely cause, and relevant secondary prevention measures. FBC, Erythrocyte Sedimentation Rate, Clotting screen – INR, APTT, Biochemistry - U&E, glucose Lipids - TC, TG, HDL, calculated LDL (<2 days or >6 weeks since event), ECG (for atrial fibrillation, recent myocardial infarction, left ventricular hypertrophy), CXR (for cardiac size, neoplasm)</p>	

Atrial Fibrillation

Risk of Stroke

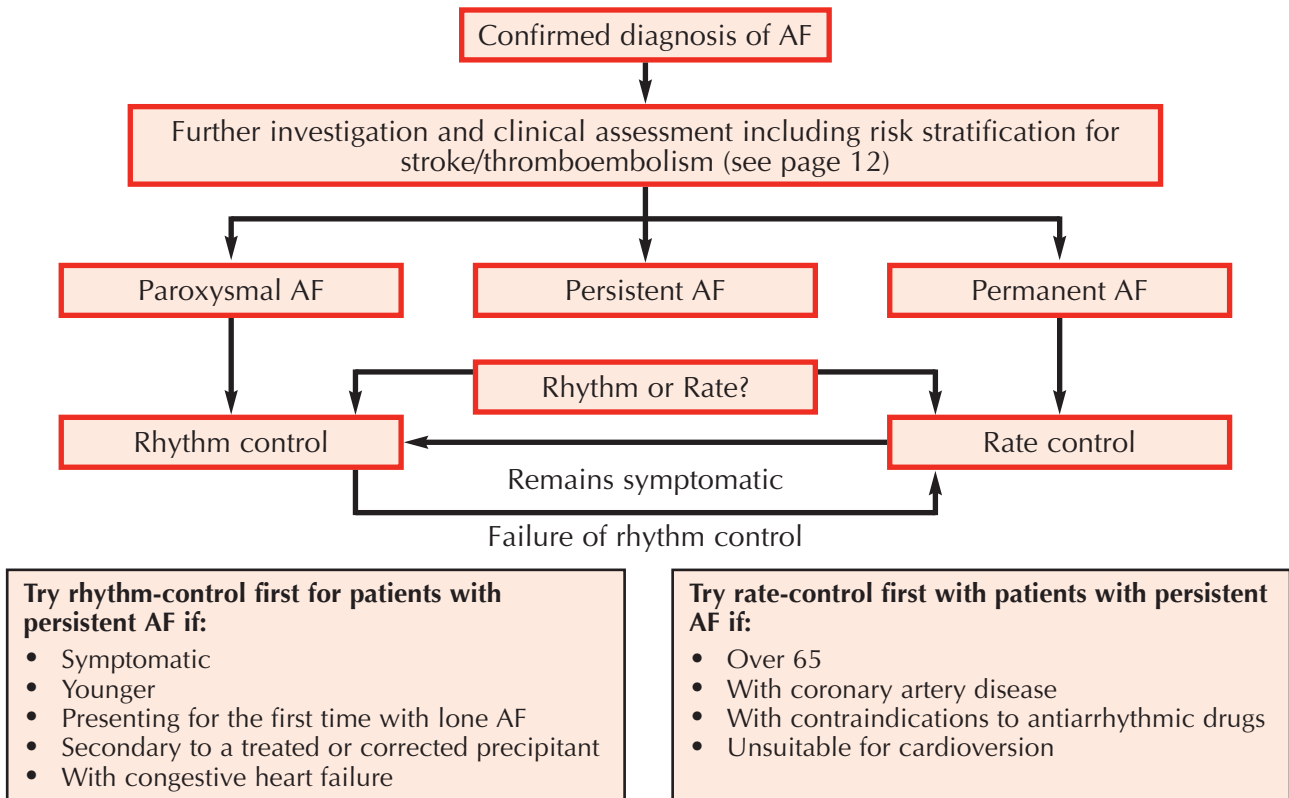
- Overall annual risk of stroke in patients with AF is estimated to be about 4.5%
- Lower in younger patients. Increases substantially in older patients or those with other co-morbid conditions.
- In the highest risk group the annual risk may be up to 12%.

Investigation

Most of the investigations can be done in general practice. Only patients with clinical evidence of valve disease or under 65 years require an echocardiogram.

Baseline investigations	Confirm diagnosis with ECG U&E, LFT, TFT, FBC, sugar
Search for a precipitating or contributory cause	alcohol abuse, post-rheumatic mitral valve disease, ischaemic heart disease, thyrotoxicosis, severe infection
Identify associated risk factors	Hypertension (HT), diabetes (DM), previous thrombo-embolic events (both cerebral and peripheral), evidence of left ventricular dysfunction

Treatment Strategy Decision Tree



See NICE Guidance: Atrial fibrillation (June 2006) for rate-control and rhythm control detail
www.nice.org.uk

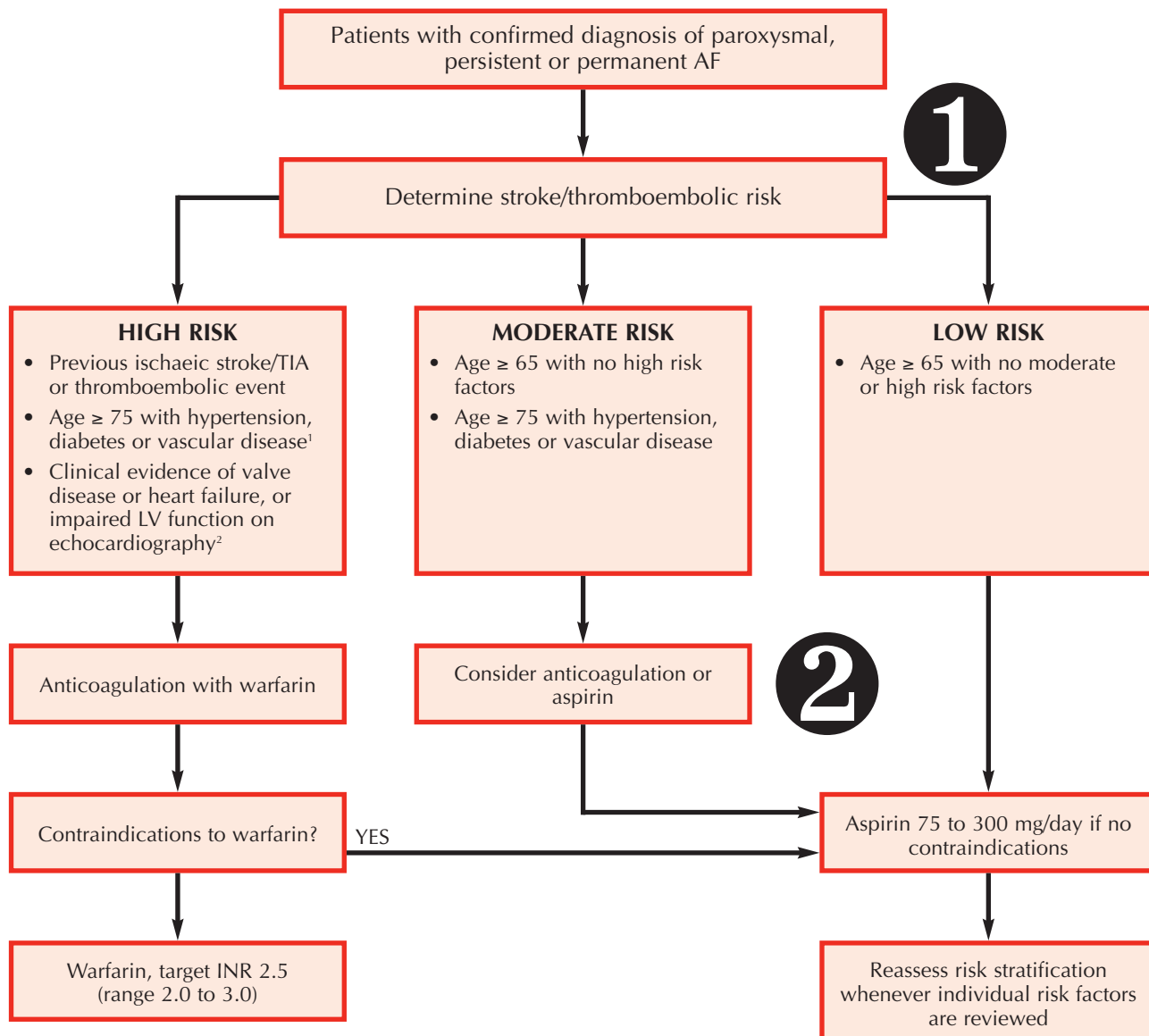
Paroxysmal AF: Terminates spontaneously <7days, most often <48 hours. Recurrent pattern

Persistent AF: Not self terminating, requires electrical or pharmacological cardioversion for termination. Recurrent pattern

Permanent AF: Long standing (>1year), not successfully terminated by cardioversion or cardioversion not attempted. Established pattern.

Recurrent = patient experiences 2 or more episodes

Stroke Risk Stratification and thromboprophylaxis (Nice Guidance June 2006)



1

Note that the risk factors are not mutually exclusive, and are additive to each other in producing a composite risk. Since the incidence of stroke and thromboembolic events in patients with thyrotoxicosis appears similar to that in patients with other aetiologies of AF, antithrombotic treatments should be chosen based on the presence of validated stroke risk factors

2

Owing to lack of clear-cut evidence, treatment may be decided on an individual basis, and the physician must balance the risks and benefits of warfarin versus aspirin. As stroke factors are cumulative, warfarin may, for example, be used in the presence of two or more moderate stroke risk factors. Referral and echocardiography may help in cases of uncertainty.

1. Coronary heart disease or peripheral vascular disease
2. An echocardiogram is not needed for routine assessment but refines clinical risk stratification in the case of moderate or severe LV dysfunction and valve disease

Anticoagulation with warfarin

- No upper age limit for treatment, but in frail elderly people consider if the burden, risk of frequent falling and risks of non-concordance with treatment, outweigh benefits.
- Said to reduce the overall risk of stroke from 4.5% to 1.4%. In highest risk group, the reduction is from 12% to 5%. The downside is the risk of a major haemorrhagic complication - about 1.5% per year.
- Haemorrhage may be provoked in patients who have another reason for bleeding, or may be spontaneous, such as intracranial and retroperitoneal bleeds.
- Up to 5% of patients p.a. may experience minor bleeding because of variations in warfarin control.
- Warfarin is the recommended drug for anti coagulation (INR of between 2 and 3, higher in patients with prosthetic cardiac valves)
- Assess the ability of the patient to comply with warfarin therapy. Consider all other co-treatments possible interference with warfarin control. Weigh the overall annual risk of embolic stroke versus the annual risk of a significant bleed when deciding anticoagulation policy.
- Patients unable or unwilling to take warfarin could take aspirin 75mg -300mg instead, although it is accepted that this will not produce as good thrombo-embolic protection.

Referral Criteria

Patients with ventricular rate problems despite 2 AV nodal blocking drugs (can combine digoxin with either diltiazem or beta blocker) or intolerance of drugs

Patients under the age of 60 with persistent AF

Cardioversion candidates eg

- Patients with symptomatic AF under 70
- -recent onset following reversible cause eg chest infection, thyrotoxicosis, MI

Peripheral Vascular Disease

Claudication

Diagnosis

- Exercise-induced pain in one / both calves - may progress to thighs or buttocks as exercise continues.
- Pain is proportional to exercise and occurs earlier ascending hills, against wind or when carrying weights.
- Pain is always relieved by rest, and does not occur at rest.
- No history of recent trauma

Rest Pain

Diagnosis

- Pain usually in the foot, affecting toes or instep.
- In its initial stages the pain typically wakes the patient in the small hours of the morning, when they paradoxically get up and walk around to help the pain.
- As the disease progresses the patient may be unable to sleep recumbent and may sleep in a chair or hang the limb over the side of the bed to gain the help of gravity in increasing limb perfusion.
- Later the pain is present constantly and requires strong analgesia.
- May be associated discolouration of the toes or tissue loss/ulceration.
- Often a history of increasing claudication

Recommended Initial Treatment For Both Claudication And Rest Pain

- High risk – treat as Secondary Prevention – see page 3
- Lifestyle advice - see page 4
- Wean off beta-blockers to an alternative anti-hypertensive drug
- Planned gradual increase of exercise “ through the pain”
- Begin aspirin 75 mg od and dipyridamole (Modified Release) 200 mg bd
- Optimisation of other conditions such as diabetes mellitus, cardiac failure, angina or obstructive pulmonary disease

Referral Criteria

- Worsening despite conservative measures
- Sudden onset
- Perceived walking distance despite conservative measures is under 50 metres or seriously compromises the quality of life or employment
- Rest pain in any circumstances. If rest pain is of sudden onset, emergency admission is needed.
- Tissue loss or ulceration develops

Guideline Development

The guidelines are based on the Nottingham Vascular Risk guidelines published in 2000. See below for original development group. They have been updated in the light of recent clinical guidance, in particular:

JBS 2: Joint British Societies' guidelines on prevention of cardiovascular disease in clinical practice

NICE

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The guidelines have been approved by the Professional Executive Committees of Nottingham City PCT, Broxtowe & Hucknall PCT, Gedling PCT, Rushcliffe PCT and the GP cluster leads across Greater Nottingham

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The guidelines will be reviewed annually after publication, or earlier if new evidence is published which impacts significantly on the recommendations

Appendix A: Patients with Chronic Kidney Disease

Patients found to have raised creatinine/low eGFR on routine testing (with or without proteinuria)

The 5 stages of Chronic Kidney Disease (CKD)

eGFR STAGE

>90 mL/min with another abnormality* = stage 1 CKD

60-89 mL/min with another abnormality* = stage 2 CKD

30-59 mL/min (moderate impairment) = stage 3 CKD

15-29 mL/min (severe impairment) = stage 4 CKD

<15 mL/min (established renal failure) = stage 5 CKD

*i.e. already known to have proteinuria, haematuria (but no urological cause) or (in diabetes) microalbuminuria. If no abnormality, then regard as normal.

If eGFR 60 – 89 ml/min:

On its own this is not an indication for further testing and does not mean someone has CKD.

If eGFR <60 ml/min:

- Review all previous creatinine results to assess rate of deterioration
- Review medication, particularly recent additions e.g. non-steroidal anti-inflammatory drugs (NSAIDs), antibiotics, mesalazine, diuretics, ACEIs/ARBs.
- Test urine for haematuria and proteinuria. If protein present request urine protein/creatinine ratio.
- Assess clinically: for urinary symptoms, palpable bladder, BP, sepsis, heart failure, hypovolaemia.
- Repeat serum creatinine measurement within 5 days to exclude rapid progression, if new finding.
- Check referral criteria: ensure entry into a chronic disease management programme if not indicated

Information needed on referral

- General medical history
- Urinary symptoms
- Medication
- Examination e.g. BP, oedema, bladder
- Urine dipstick for blood and protein
- Urine for PCR if proteinuria present
- Blood count
- Serum creatinine, urea, sodium, potassium, albumin, calcium, phosphate, cholesterol, HbA1c (in diabetes)
- All previous creatinine results with dates
- Result of renal ultrasound if available.

Criteria for Referral

Stages 1/2

- Malignant hypertension (Urgent)
- Hyperkalaemia (>7 mmol/L) (Urgent)
- Nephrotic syndrome (Urgent)
- Isolated proteinuria (protein:creatinine ratio) (PCR >100mg/mmol)
- Proteinuria and microscopic haematuria (PCR > 45 mg/mmol)
- Diabetes with proteinuria (PCR >100 mg/mmol) but no retinopathy
- Macroscopic haematuria (after negative urological evaluation)
- Uncontrolled hypertension (e.g. BP >150/90 on 4 agents)
- Recurrent pulmonary oedema with normal left ventricular function
- Fall of eGFR of >15% during first 2 months on ACEI/ARB

Stage 3

As above, plus:

- Progressive fall in GFR
- Microscopic haematuria (after negative urological tests if >50 years old)
- Proteinuria (urine protein:creatinine ratio > 45 mg/mmol)
- Anaemia (after exclusion of other causes)
- Persistently abnormal serum potassium, calcium, phosphate, (uncuffed sample)
- Suspected underlying systemic illness, e.g. SLE, vasculitis, myeloma
- Uncontrolled hypertension (e.g. BP > 150/90 on 4 agents)

Stages 4/5 (Urgent)

All patients should be referred or at least discussed formally with a nephrologist and offered the options of renal replacement therapy (RRT) or conservative therapy, even if it is not anticipated that RRT will be appropriate. Exceptions may include if the CKD is part of terminal illness or function is stable and relevant tests completed and appropriate management implemented with an agreed treatment plan.

Management of Chronic Kidney Disease (CKD)

All stages – to include

- Regular clinical and laboratory assessment
- Advice on smoking, weight, exercise, salt & alcohol intake
- Cardiovascular prophylaxis: if risk >20% at 10 years consider
 - aspirin if BP <150/90 mm Hg
 - lipid lowering drugs (or entry into trial)
- BP monitoring by BHS methods at least once a year
- Meticulous BP control
 - threshold 140/90, target 130/80 mmHg in most patients
 - threshold 130/80, target 125/75 mmHg if urine PCR>100 mg/mmol
 - include ACEI or ARB if urine PCR >100 mg/mmol or if diabetes and microalbuminuria present
 - + check creatinine and potassium before starting and 2 weeks after start and after each dose change + if creatinine increases by >20% or GFR falls by >15%
 - repeat with potassium and seek advice (?stop ? test for RAS)
- If potassium > 6 mmol/L - check no haemolysis and check diet
 - stop NSAIDs and LoSalt
 - stop K - retaining diuretics
 - stop ACEI/ARB if hyperkalaemia persists

CKD Stage 3: additional management to include –

- If Hb <11 g/dL and other causes excluded
 - refer for IV iron +/- ESA with target Hb 11-12 g/dl
- Renal ultrasound if
 - lower urinary tract symptoms
 - refractory hypertension
 - unexpected fall in eGFR
- Immunise against influenza and pneumococcus
- Review all drugs - ensure correct dose
 - avoid nephrotoxic drugs eg NSAIDs if possible
- Check PTH level when stage 3 first diagnosed
 - if high check 25-hydroxy vit D & if low give ergo- or cole-calciferol with calcium supplement (not phosphate)
 - repeat PTH after 3 months and refer if still high
- CKD Stages 4/5 : additional management to include *–
- Dietary assessment
- Immunisation against hepatitis B
- Management of hyperparathyroidism
- Correction of acidosis
- Information about options for treatment
- Timely dialysis access procedure
- Referral/discussion even if dialysis may not be appropriate
- In conjunction with the renal unit

Nottingham Health Community – Clopidogrel Prescribing Guideline

Condition	First Drug Choice	Duration	Contraindicated/Intolerant to First Choice (aspirin intolerance is defined as hypersensitivity)		
Acute Coronary Syndrome (ACS)					
STEMI*	Aspirin 75mg	Long Term	Clopidogrel long term ¹		
NSTEMI*	Aspirin 75mg + Clopidogrel 75mg	Aspirin long term +	Clopidogrel long term ¹		
				Bare metal stent	Clopidogrel for 3 months then stop
				Drug eluting stent	Clopidogrel for 6 months then stop
				Others	Clopidogrel for 12 months then stop ^{2,3}
The duration of treatment must be clearly specified on discharge					
Unstable angina	Aspirin 75mg	Long Term	Clopidogrel long term		
Stroke					
Stroke/TIA*	Aspirin 75mg + dipyridamole MR 200mg bd	Aspirin long term + Dipyridamole MR 2 years then stop ⁴	Clopidogrel long term ¹ or aspirin alone if intolerant to dipyridamol MR		
Peripheral Arterial Disease					
PAD*	Aspirin 75mg	Long Term	Clopidogrel long term ^{1,2}		

Aspirin Intolerance is

Proven hypersensitivity ie in whom aspirin induces angio-oedema or bronchospasm

Options for managing aspirin related dyspepsia

Ensure patients in on 75mg dose of aspirin

Take aspirin with food

Aspirin in combination with gastro-protection eg PPI has shown to be to be superior in preventing a recurrent ulcer bleed.⁵

Glossary*

STEMI (S-T elevated myocardial infarction – major MI), **NSTEMI** (Non S-T elevated myocardial infarction – moderate MI), **TIA** (transient ischaemic attack), **PAD** (peripheral arterial disease)

References

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