Cardiovascular disease

What's new?

- CVD risk assessment and management
- Hypertension
- VTE diseases
- Chronic heart failure
- Atrial fibrillation

CVD risk assessment and management

The good news – and the bad

- Number of CVD deaths in the UK has almost halved in the last 40 years
- 60% of the CVD mortality decline in the UK during the 1980s and 1990s was attributable to reductions in major risk factors, mainly smoking
- CVD still accounts for almost 1/3 of deaths in England and Wales
- 7 million people in the UK live with CVD
- In 2010, 180,000 people in England and Wales died from CVD (80,000 from CHD, 49,000 from CVA)
- CVD costs to NHS in England alone were £7,880 million in 2010

NICE 2015. Cardiovascular risk assessment and risk modification. https://www.nice.org.uk/guidance/QS100

NICE Quality Standards

- **Formal CVD risk assessment for high risk under 85s using QRISK2**
- **Assess 10-year risk of CVD of 10% or more for secondary causes before any offer of statin therapy (e.g. uncontrolled diabetes, hypothyroidism, liver disease and nephrotic syndrome)**
- **Lifestyle advice for primary prevention before offer of statin therapy**
- **If 10-year risk of CVD of 10% or more, discuss risks and benefits of statins for primary prevention**
- **Offer of atorvastatin 20mg for adults choosing statin therapy for the primary prevention of CVD**
- **Offer of atorvastatin 80mg for adults with newly diagnosed CVD**
- **Adults on a high-intensity statin who have side-effects are offered a lower dose or an alternative statin - any statin at any dose reduces the risk of CVD**
- **At 3 months, check lipids and liver transaminases**
- **Identifying people with an estimated increased risk – the placeholder statement!**

NICE 2015. Cardiovascular risk assessment and risk modification. https://www.nice.org.uk/guidance/QS100

	Reduction in low-density lipoprotein cholesterol				
Dose (mg/day)	5	10	20	40	80
Fluvastatin	–	–	21%[1]	27%[1]	33%[2]
Pravastatin	–	20%[1]	24%[1]	29%[1]	–
Simvastatin	–	27%[1]	32%[2]	37%[2]	42%[3,4]
Atorvastatin	–	37%[2]	43%[3]	49%[3]	55%[3]
Rosuvastatin	38%[2]	43%[3]	48%[3]	53%[3]	–

[1] 20%–30%: low intensity.
[2] 31%–40%: medium intensity.
[3] Above 40%: high intensity.
[4] Advice from the MHRA: there is an increased risk of myopathy associated with high-dose (80 mg) simvastatin. The 80 mg dose should be considered only in patients with severe hypercholesterolaemia and high risk of cardiovascular complications who have not achieved their treatment goals on lower doses, when the benefits are expected to outweigh the potential risks.

Meet Mr B – you all know someone like him

- Age 52
- Smoker
- Blood pressure okay (for now)
- Total cholesterol okay but total:HDL 4.6

About you

Age (25-84): 52

Sex: Male Female

Ethnicity: White or not stated

UK postcode: leave blank if unknown

Postcode: W6 7HY

Clinical information

Smoking status: heavy smoker (20 or over)

Diabetes status: none

Angina or heart attack in a 1st degree relative < 60?

Chronic kidney disease (stage 4 or 5)?

Atrial fibrillation?

On blood pressure treatment?

Rheumatoid arthritis?

Leave blank if unknown

Cholesterol/HDL ratio: 4.6

Systolic blood pressure (mmHg): 128

Body mass index

Height (cm): 180

Weight (kg): 70

Calculate risk over 10 years. Calculate risk

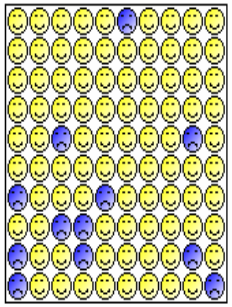
Your results

Your risk of having a heart attack or stroke within the next 10 years is:

11.8%

11.8%

In other words, in a crowd of 100 people with the same risk factors as you, 12 are likely to have a heart attack or stroke within the next 10 years.



Risk of
heart attack or stroke

Your score has been calculated using the data you entered.

Your body mass index was calculated as 21.6 kg/m^2.

How does your 10-year score compare?

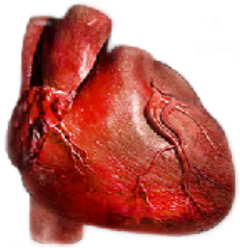
Your score

Your 10-year QRISK®2 score	11.8%
The score of a healthy person with the same age, sex, and ethnicity*	4.8%
Relative risk**	2.5
Your QRISK® Healthy Heart Age***	64

JBS3 Cardiovascular Risk Assessment

Profile | Heart Age | Healthy Years | Outlook

more



Your heart age is about

65

compared to a person of the same age, gender and ethnicity with optimal risk factors

Interventions

Future smoking category

20+/day

Systolic Blood Pressure

128 → 128

Total Cholesterol

5.3 → 5.3

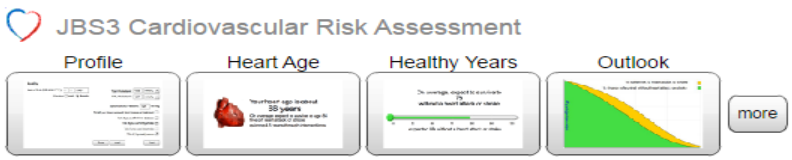
HDL Cholesterol

0.8 → 0.8

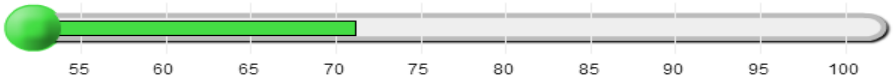
NonHDL Cholesterol: 4.5

BMI: 21.6

Reset



On average, expect
to survive to age 71
without a heart attack or stroke



expected life without a heart attack or stroke

Your risk of a heart attack or stroke
in the next 10 years is

12%

assuming you don't die of anything else

Interventions

Future smoking category
20+/day

Systolic Blood Pressure
128 → 128

Total Cholesterol
5.3 → 5.3

HDL Cholesterol
0.8 → 0.8

NonHDL Cholesterol: 4.5

BMI: 21.6

Reset

If he stops smoking

About you

Age (25-84): 52

Sex: Male Female

Ethnicity: White or not stated

UK postcode: leave blank if unknown

Postcode: W6 7HY

Clinical information

Smoking status: ex-smoker

Diabetes status: none

Angina or heart attack in a 1st degree relative < 60?

Chronic kidney disease (stage 4 or 5)?

Atrial fibrillation?

On blood pressure treatment?

Rheumatoid arthritis?

Leave blank if unknown

Cholesterol/HDL ratio: 4.6

Systolic blood pressure (mmHg): 128

Body mass index

Height (cm): 180

Weight (kg): 70

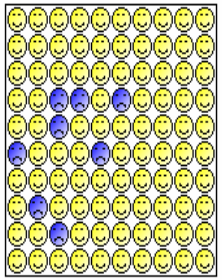
Calculate risk over 10 years. Calculate risk

Your results

Your risk of having a heart attack or stroke within the next 10 years is:

7.9%

In other words, in a crowd of 100 people with the same risk factors as you, 8 [7.9%] oke within the next 10 years.



Risk of heart attack or stroke

Your score has been calculated using the data you entered.

Your body mass index was calculated as 21.6 kg/m^2.

How does your 10-year score compare?

Your score

Your 10-year QRISK®2 score	7.9%
The score of a healthy person with the same age, sex, and ethnicity*	4.8%
Relative risk**	1.6
Your QRISK® Healthy Heart Age***	58

But if he gets Type 2 diabetes

About you

Age (25-84): 52

Sex: Male Female

Ethnicity: White or not stated

UK postcode: leave blank if unknown

Postcode: W6 7HY

Clinical information

Smoking status: heavy smoker (20 or over)

Diabetes status: type 2

Angina or heart attack in a 1st degree relative < 60?

Chronic kidney disease (stage 4 or 5)?

Atrial fibrillation?

On blood pressure treatment?

Rheumatoid arthritis?

Leave blank if unknown

Cholesterol/HDL ratio: 4.6

Systolic blood pressure (mmHg): 128

Body mass index

Height (cm): 180

Weight (kg): 70

Calculate risk over 10 years. Calculate risk

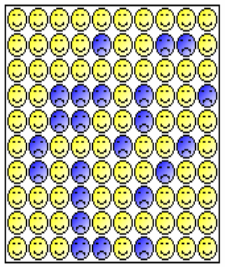
Your results

Your risk of having a heart attack or stroke within the next 10 years is:

23.4%

23.4%

In other words, in a crowd of 100 people with the same risk factors as you, 23 are likely to have a heart attack or stroke within the next 10 years.



Risk of
heart attack or stroke

Your score has been calculated using the data you entered.

Your body mass index was calculated as 21.6 kg/m^2.

How does your 10-year score compare?

Your score

Your 10-year QRISK®2 score	23.4%
The score of a healthy person with the same age, sex, and ethnicity*	4.8%
Relative risk**	4.9
Your QRISK® Healthy Heart Age***	74

Special cases

- Type 1 diabetes over 40 years old, >10 years since diagnosis or with nephropathy – offer 20mg atorvastatin
- All patients with CKD should be offered atorvastatin 20mg for primary or secondary prevention. Consider high dose atorvastatin if >40% reduction in non-HDL not achieved
- Consider high-intensity statins for patients with rheumatoid arthritis
- Do not do QRISK2 assessment for patients with FH
- Statins are contraindicated in pregnancy

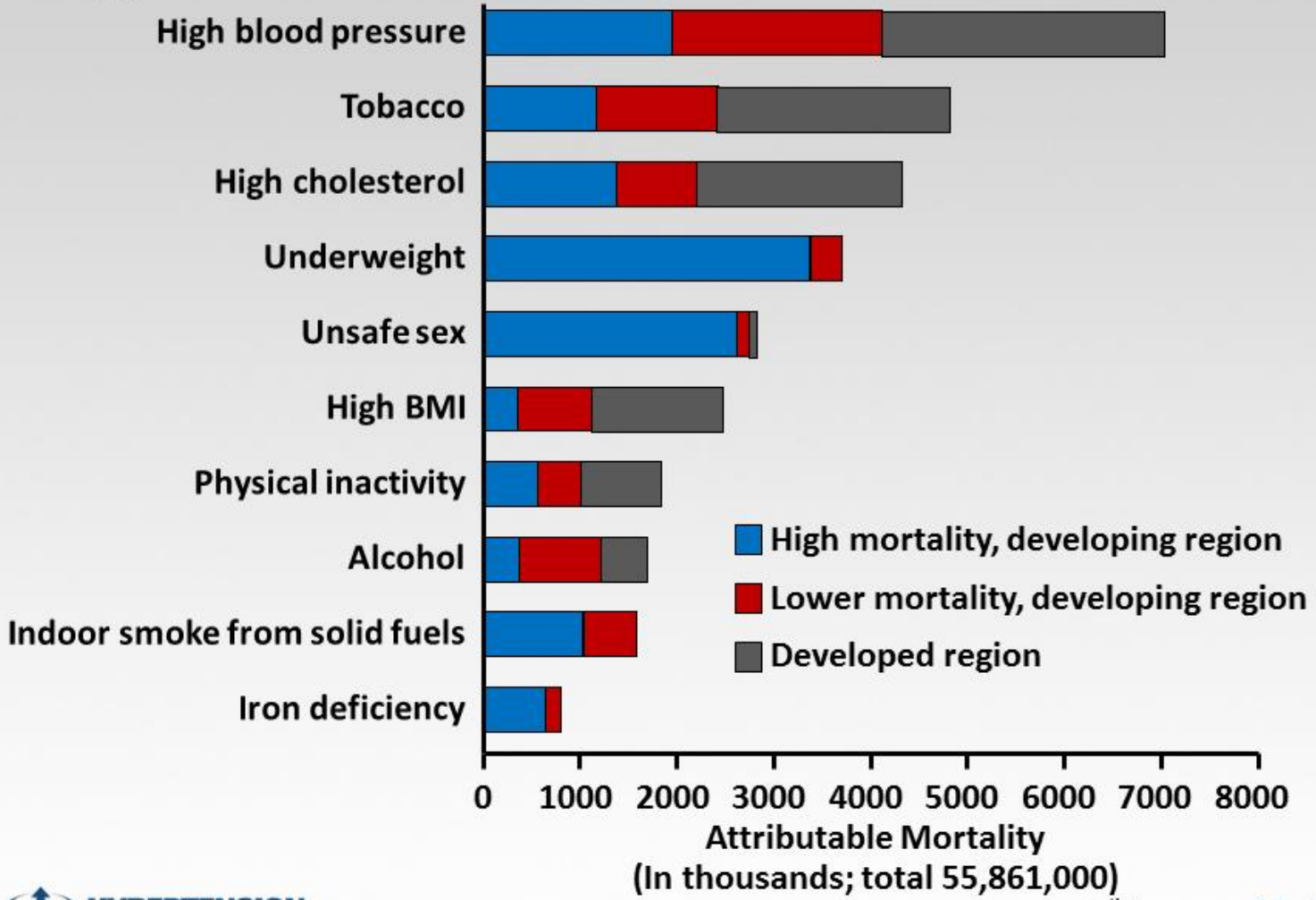
Audit Idea and Key Points - CV Risk & Lipids

AUDIT: Patients aged 40 to 50 identified at having >10% risk

1. Proportion taking statins/documentation of discussion and informed dissent
2. Consider lifetime risk/heart age
3. Lifestyle advice documented?
4. If on statins, lipids/LFTs at 3 months?

Hypertension

Global Mortality 2000: Impact of Hypertension and Other Health Risk Factors



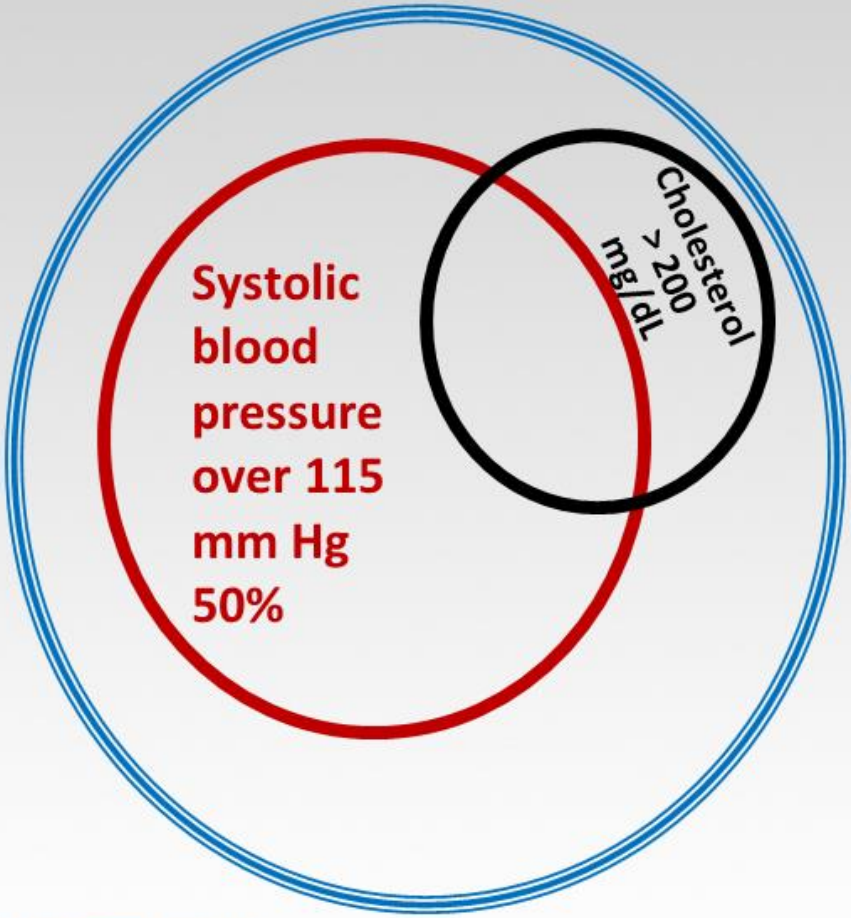
HYPERTENSION

Adapted from Ezzati M, et al. *Lancet.* 2002;360:1347-1360.

theheart.org from WebMD

Medscape EDUCATION

High Blood Pressure, High Blood Cholesterol, and Cardiovascular Diseases



CVD Burden

↑ Blood Pressure

↑ Cholesterol

Overall, 61% of cardiovascular disease is due to high blood pressure and/or hypercholesterolemia

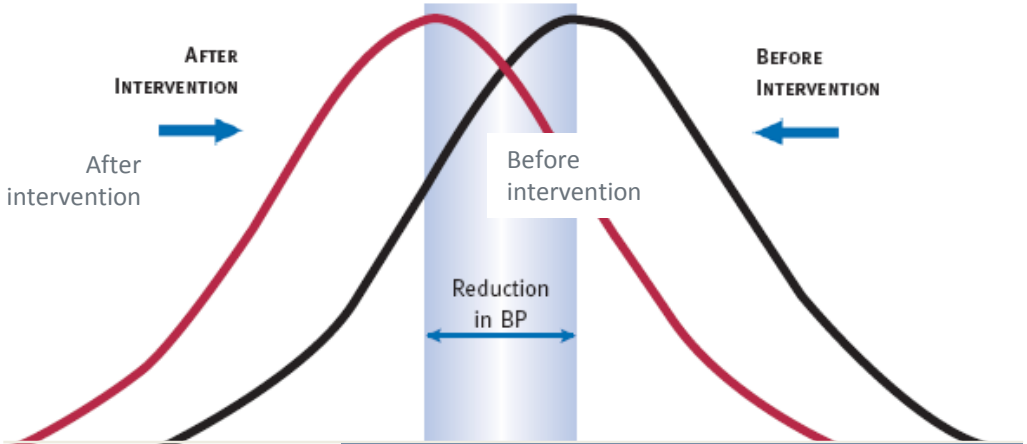
HYPERTENSION

WHO Global Programme on Evidence for Health Policy.

theheart.org from WebMD

Medscape EDUCATION

Modest reductions in SBP can substantially reduce cardiovascular mortality



	% Reduction in Mortality		
Reduction in SBP (mmHg)	Stroke	CHD	Total
2	-6	-4	-3
3	-8	-5	-4
5	-14	-9	-7

SBP = systolic blood pressure; CHD = coronary heart disease

Adapted from Whelton PK, et al. *JAMA* 2002;288:1882-1888.

Taking blood pressure (NICE 2011)

- Error reading? Think AF!
- When considering a diagnosis of hypertension, measure blood pressure in both arms
- If the difference in readings between arms is more than 20 mmHg, repeat the measurements
- If the difference in readings between arms remains more than 20 mmHg on the second measurement, measure subsequent blood pressures in the arm with the higher reading
- Difference of over 15mmHg between arms? Think high risk for CVD or PAD (1)
- 20mmHg drop on standing for at least 1 minute = postural drop

1) Clark C et al. Association of a difference in systolic blood pressure between arms with vascular disease and mortality: a systematic review and meta-analysis. Lancet 2012; 379 (9819): 905-914.

Definitions of hypertension

- **Stage 1** hypertension: initial clinic BP 140/90mmHg or higher and subsequent ABPM daytime average or home blood pressure monitoring (HBPM) average blood pressure 135/85mmHg or higher.
- **Stage 2** hypertension: initial clinic blood pressure 160/100mmHg or higher and subsequent ABPM daytime average or HBPM average BP 150/95mmHg or higher.
- **Severe hypertension:** clinic blood pressure 180/110mmHg or higher.

NICE guidance 2011

Diagnosing hypertension

- If the first and second blood pressure measurements taken during a consultation are 140/90mmHg or higher, offer 24-hour ambulatory blood pressure monitoring (ABPM) to confirm the diagnosis of hypertension.
- Use the average daytime blood pressure measurement, calculated using a minimum of 14 daytime measurements, to confirm a diagnosis of hypertension
- Investigation for end-organ damage (at least a urine dipstick and ECG)
- Consider treating before referring for ABPM if severe hypertension (180/110mmHg or higher)

Who do we treat?

- Treat Stage 1 hypertension WITH
    - target organ damage
    - established cardiovascular disease
    - renal disease
    - diabetes
    - a 10-year cardiovascular risk equivalent to 20% or greater
  - Treat people of any age with stage 2 hypertension
  - Consider referral of under 40s with stage 1 hypertension

(10-year CV risk assessments may underestimate lifetime risk)

Secondary hypertension - causes

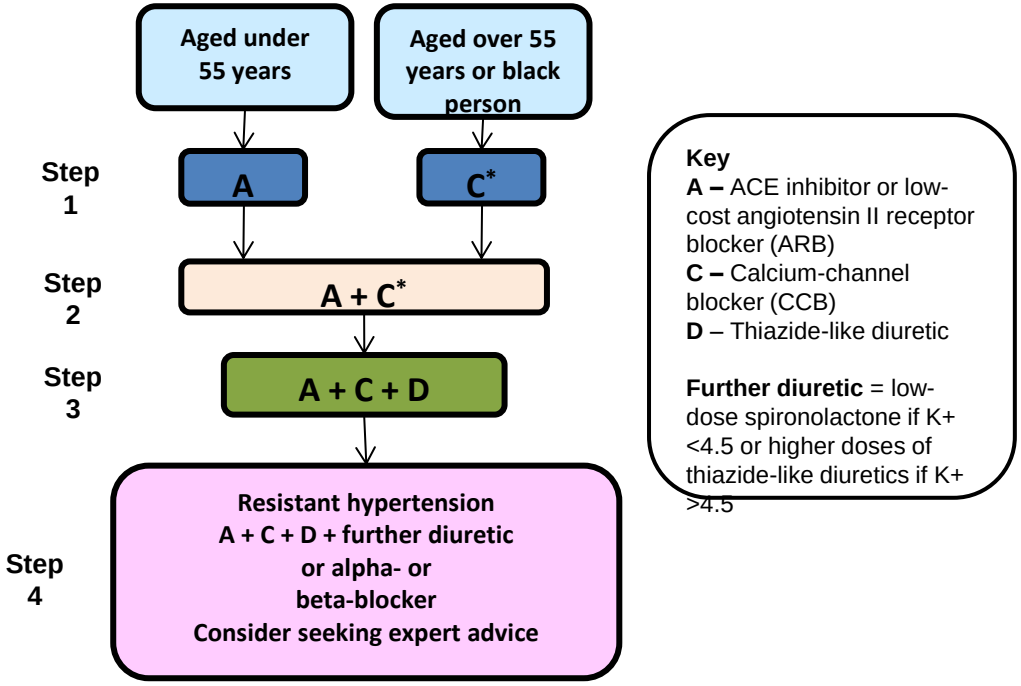
- Drug-induced: NSAIDs, steroids, combined oral contraceptive, illicit drugs
- Endocrine disease: Conn's and Cushing's syndromes, phaeochromocytoma, acromegaly, hyperthyroidism
- Renal disease: diabetic nephropathy, renovascular disease, glomerulonephritis, polycystic kidney disease, chronic pyelonephritis
- Congenital: coarctation of the aorta
- Other: aortic regurgitation, pre-eclampsia, obesity, excessive dietary salt or liquorice intake, acute porphyria

Witte K, Craven T, Thackray S. Clinical review: hypertension. October 2015. http://www.gponline.com/clinical-review-hypertension/cv-blood-pressure/hypertension/article/1367253

BHS British Hypertension Society

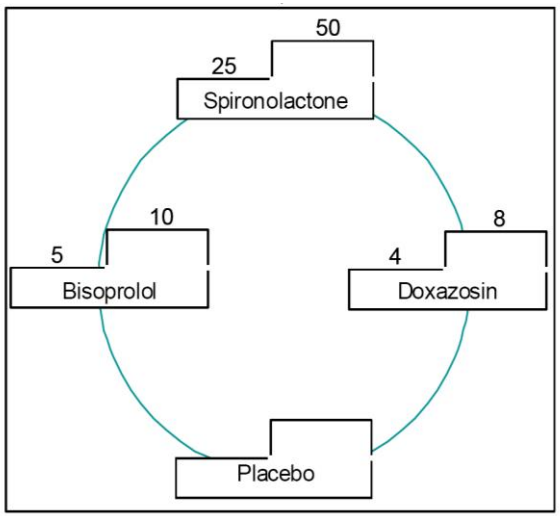
NHS National Institute for Health and Clinical Excellence

Summary of antihypertensive drug treatment



BHS PATHWAY-2

Investigation of optimal treatment for resistant hypertension



Number refers to dose in mgs.

12-week treatment cycles
Forced dose up-titration at week 6

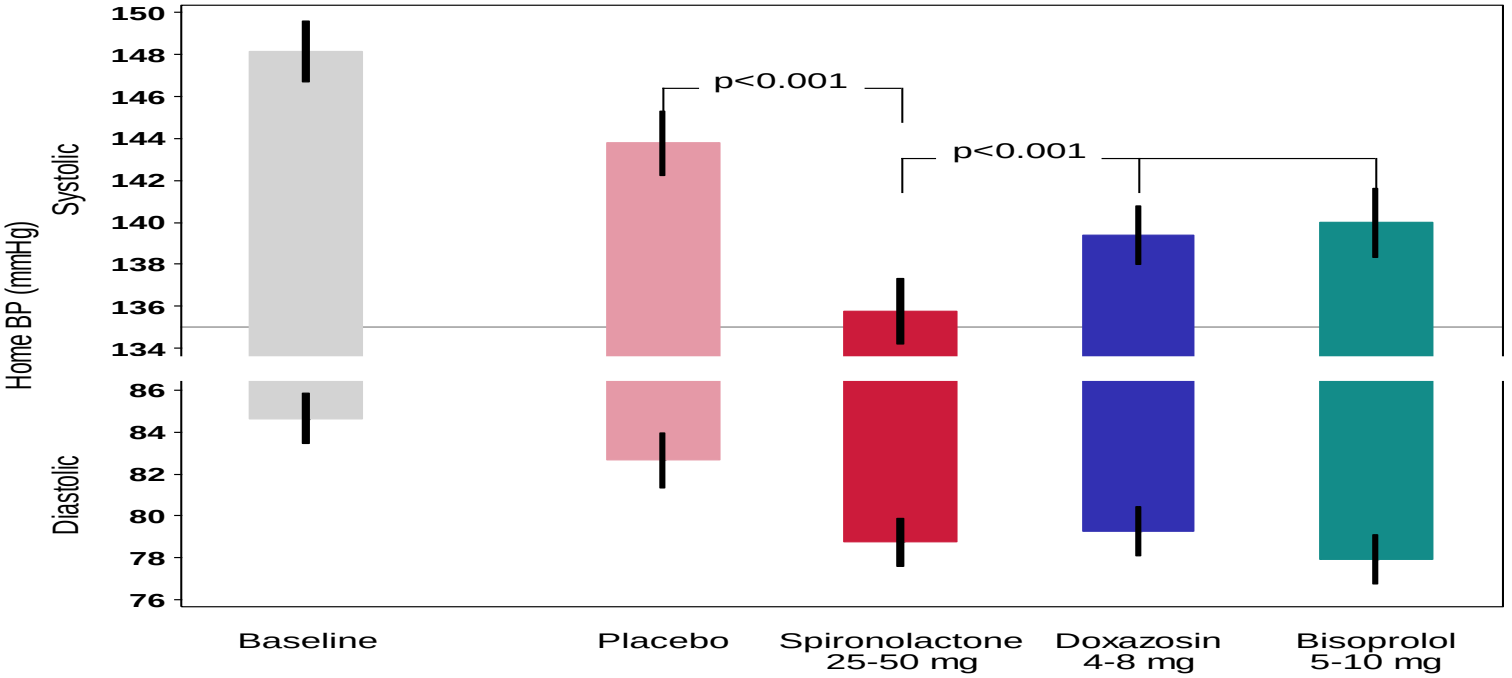
Randomised
Double Blind
Double Dummy
Placebo-controlled
Crossover study

Baseline Renin:
Does it predict best drug?

Williams B et al. The Lancet 2015; 386 (10008): 2059-2068.

PATHWAY
Clinical Trials in Hypertension

Primary outcome



Williams B et al. The Lancet 2015; 386 (10008): 2059-2068.

What are our targets?

- Aim for a target clinic BP below 150/90mmHg in people aged over 80 years with treated hypertension
- ? Below 150/80mmHg for 'free range' over 80s? (1)
- Aim for a target clinic BP below 140/90mmHg in people aged under 80 years with treated hypertension

BUT

- Greatest reduction in cardiovascular morbidity is seen where the diastolic BP is controlled to <80mmHg in all age groups (2)
- Should we 'SPRINT' to a target of below 120mmHg systolic instead? (3)

1) Beckett N, Peters R, Fletcher A et al. Treatment of hypertension in patients 80 years of age or older.
NEJM 2008; 358 (18):1887-1898
2) Witte K, Craven T, Thackray S. Clinical review: hypertension. October 2015. http://www.gponline.com/clinical-review-hypertension/cv-blood-pressure/hypertension/article/1367253
3) The SPRINT Research Group. A randomized trial of intensive versus standard blood-pressure control.
N Engl J Med 2015; 373: 2103-16. DOI: 10.1056/NEJMoa1511939

Exceptions to the rule

- In type 2 diabetes, 1st line ACE-I unless African-Caribbean (1)
- In type 2 diabetes, ACE-I + diuretic/CCB if African-Caribbean (1) or
- In type 2 diabetes, CCB if chance of pregnancy (1)
- BP targets in type 2 diabetes (1)
- Below 140/80 or
- Below 130/80 if kidney, eye or cerebrovascular damage
- BUT a recent meta-analysis suggests systolic BPs below 140mmHg may be associated with HIGHER mortality – a J-shaped curve? (2)

1) NICE. Type 2 diabetes in adults: management. https://www.nice.org.uk/guidance/ng28
2) Brunström M, Carlberg B. Effect of antihypertensive treatment at different blood pressure levels in patients with diabetes mellitus: systematic review and meta-analyses. *BMJ* 2016; 352. DOI: http://dx.doi.org/10.1136/bmj.i717

Hold your horses!

- Calcium channel blockers
  - Diltiazem/verapamil have negative inotropic and chronotropic effects – beware in heart failure
  - Amlodipine and heart failure – conflicting results (NOT contraindicated, use with caution)
  - PRAISE-2 – patients with severe heart failure; no effect on mortality but higher pulmonary oedema (1)
- DON'T combine ACE and ARB (2)
- BEWARE spironolactone with ACE especially in marked renal impairment – possible fatal hyperkalaemia (2)

1) Packer M et al. Effect of amlodipine on the survival of patients with severe chronic heart failure due to a nonischemic cardiomyopathy: results of the PRAISE-2 study. JACC Heart Fail. 2013;1(4):308-14.
2) NICE. Type 2 diabetes in adults: management. https://www.nice.org.uk/guidance/ng28.
3) https://www.gov.uk/drug-safety-update/spironolactone-and-renin-angiotensin-system-drugs-in-heart-failure-risk-of-potentially-fatal-hyperkalaemia

Resistant hypertension

- Is it really?
- Renal artery denervation – not all we had hoped

Bhatt DL, Kandzari DE, O'Neill WW et al. A controlled trial of renal denervation for resistant hypertension. *N Engl J Med* 2014; 370: 1393-1401. DOI: 10.1056/NEJMoa1402670

Audit Idea and Key Points - Hypertension

AUDIT: Uncontrolled patients aged under 80 on one or two hypertensive drugs

1. In severe hypertension start treatment immediately
2. Be prepared to use three drugs in uncontrolled patients
3. Spironolactone is the best treatment for resistant hypertension if potassium is <4.5

VTE DISEASES

Two-level DVT Wells score from NICE

NHS
National Institute for
Health and Clinical Excellence

Clinical feature	Points
Active cancer (treatment ongoing, within six months, or palliative)	1
Paralysis, paresis or recent plaster immobilisation of the lower extremities	1
Recently bedridden for three days or more or major surgery within 12 weeks requiring general or regional anaesthesia	1
Localised tenderness along the distribution of the deep venous system	1
Er	
Calf swelling at least 3cm larger than asymptomatic side	1
Pitting oedema confined to the symptomatic leg	1
Collateral superficial veins (nonvaricose)	1
Previously documented DVT	1
An alternative diagnosis is at least as likely as DVT	–2
Clinical probability simplified score	
DVT likely	2 points or more
DVT unlikely	1 point or less

38.8% patients have Wells score <2 & normal D dimer
No need to Refer or Scan

Wells PS. New Eng J Med. 2003.

If you suspect a DVT – unlikely 2 level Wells score

- D-Dimer negative – no need to scan
- D-dimer positive:
  - A proximal leg vein USS carried out within 4 hours of being requested; or
  - If no 4 hour USS available, interim 24-hour dose of a parenteral anticoagulant and a proximal leg USS within 24 hours of being requested
- Repeat the proximal leg vein USS 6-8 days later for all patients with a positive D-dimer test and –ve proximal leg vein USS

2012 NICE CG 144 – VTE management

If you suspect a DVT – likely 2-level Wells score:

Either

- A proximal leg vein ultrasound scan within 4 hours and, if the result is negative, a D-dimer test; or
- A D-dimer test and an interim 24-hour dose of a parenteral anticoagulant (if a proximal leg vein ultrasound scan cannot be carried out within 4 hours) and a proximal leg vein ultrasound scan carried out within 24 hours of being requested

2012 NICE CG 144 – VTE management

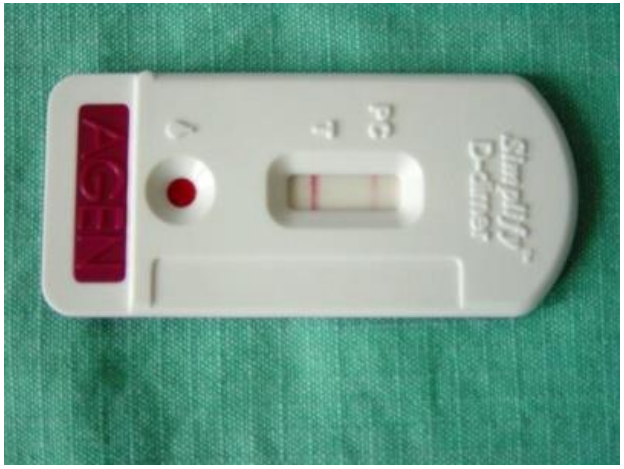
Pulmonary Embolism score

NHS National Institute for Health and Clinical Excellence

Clinical feature	**Points**
Clinical signs and symptoms of DVT (minimum of leg swelling and pain with palpation of the deep veins)	3
An alternative diagnosis is less likely than PE	3
Heart rate >100 beats per minute	1.5
Immobilisation for more than 3 days or surgery in the previous 4 weeks	1.5
Previous DVT/PE	1.5
Haemoptysis	1
Malignancy (on treatment, treated in the last 6 months, or palliative)	1
Clinical probability simplified scores	
PE likely	**More than 4 points**

NHS
National Institute for
Health and Clinical Excellence

- D-dimer
  - A monoclonal antibody assay
  - Age related
- Capillary test – qualitative
- Venous test – quantitative
  - Laboratory or Point of Care Testing (POCT)
  - Cut-off 400pg/ml
  - 93-95% sensitivity
  - 50% specificity



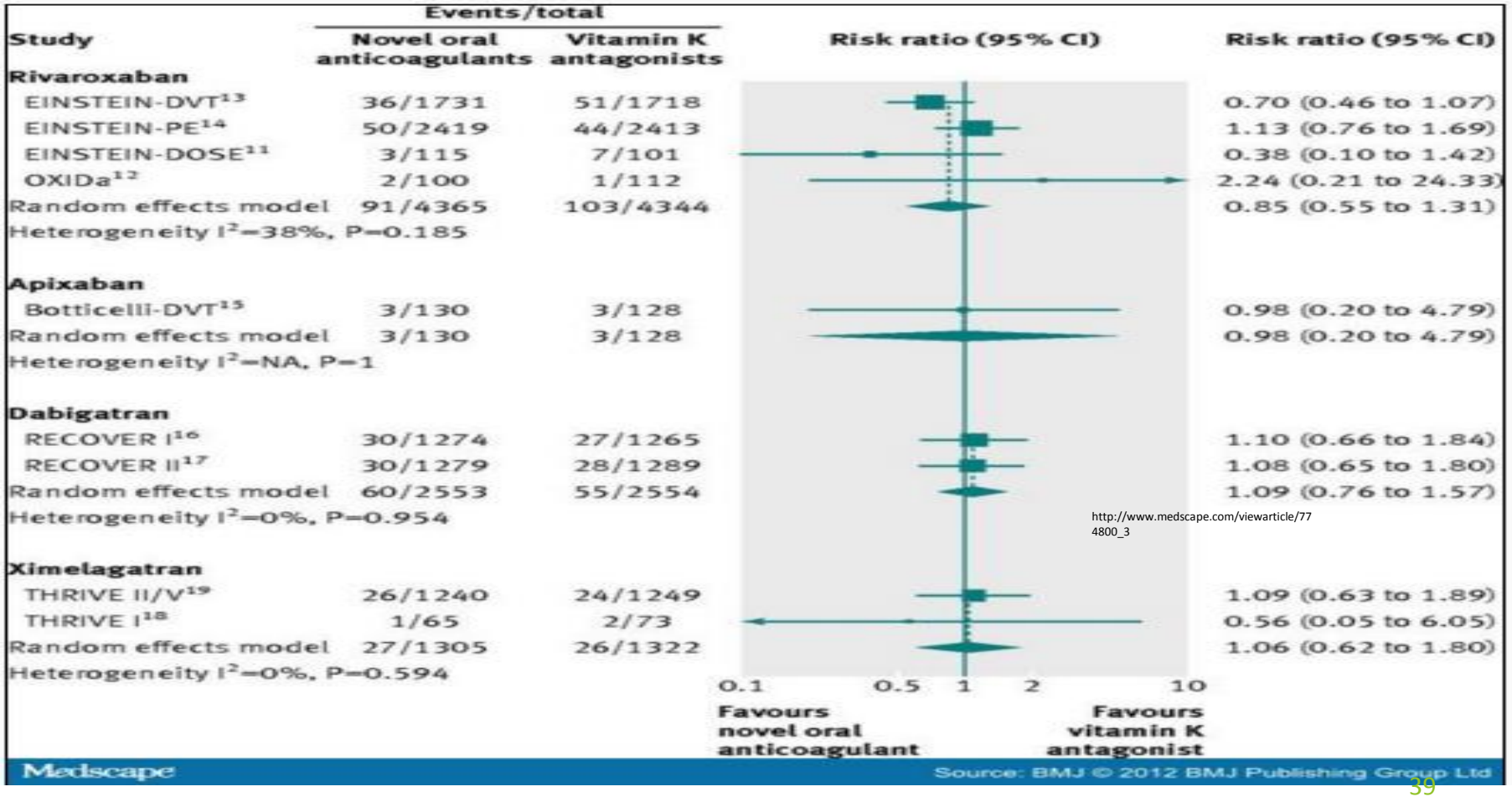
Schrecengost JE, LeGallo RD, Boyd JC et al. Comparison of diagnostic accuracies in outpatients and hospitalized patients of D-dimer testing for the evaluation of suspected pulmonary embolism. *Clinical Chemistry* 2003; **49** (9): 1483–1490.

NOACs

- Not specifically mentioned in NICE
- BUT all approved by NICE TAGs for treatment of DVT
- Dabigatran – standard dose 150mg bd after 5 days parenteral anticoagulation (110mg bd in some circumstances)
- Apixaban 10mg bd for 7 days then 5mg bd for at least 3 months
- Rivaroxaban 15mg bd for 21 days then 20mg od
- Edoxaban 60mg od (30mg od in certain patient groups)

1) https://www.nice.org.uk/guidance/ta327 2) https://www.nice.org.uk/guidance/ta341 3) https://www.nice.org.uk/guidance/ta261/chapter/2-The-technology
4) https://www.nice.org.uk/guidance/ta354

Relative risk for recurrent VTE – NOACs vs warfarin



http://www.medscape.com/viewarticle/774800_3

1.6 Thrombophilia testing

- 1.6.1 Do not offer thrombophilia testing to patients who are continuing anticoagulation treatment. **[2012]**
- 1.6.2 Consider testing for antiphospholipid antibodies in patients who have had unprovoked DVT or PE if it is planned to stop anticoagulation treatment. **[2012]**
- 1.6.3 Consider testing for hereditary thrombophilia in patients who have had unprovoked DVT or PE and who have a first-degree relative who has had DVT or PE if it is planned to stop anticoagulation treatment.**[2012]**
- 1.6.4 Do not offer thrombophilia testing to patients who have had provoked DVT or PE. **[2012]**
- 1.6.5 Do not routinely offer thrombophilia testing to first-degree relatives of people with a history of DVT or PE and thrombophilia. **[2012]**
- **(In patients with unprovoked VTE consider screening for cancer)**

2012 NICE CG 144 – VTE management

Audit Idea and Key Points - VTE

AUDIT: Your practice's use of D-dimers. LMWH prescribing. Management of unprovoked VTE.

1. A low Wells score and negative D-dimer safely excludes VTE
2. LMWH is not needed with certain NOACs
3. Few people need thrombophilia screening

CHRONIC HEART FAILURE

Lee – a 72 year-old Asian man

- Myocardial infarction 17 years ago
- Complaining of cough, SOBOE and fatigue for 10 weeks
- Takes atenolol 50mg, atorvastatin 40mg, aspirin 75mg and ramipril 10mg
- BP 105/66, ankle swelling
- NTproBNP 1053pg/ml (ULN 399)
- CXR = left atrial dilatation, pulmonary congestion and upper lobe diversion

Following NICE QS9, Lee…..

1. …would benefit from a diuretic
2. …requires a two-week referral for his very high BNP
3. …should continue all his current drugs
4. …would benefit from referral to a heart failure nurse
5. …correctly assumes his GP must follow the quality standard

NICE QS9 - 2011 (Updated 2016)

1. Refer for specialist assessment and ECHO
2. History of MI or very high BNP (>2000 pg/ml) need 2w referral
3. Use and gradually up-titrate ACEi and beta-blocker
4. Review within 2 weeks after medicines change 2016
5. Full reviews six monthly
6. Offer cardiac rehabilitation
7. Offer choice of where the rehab happens 2016

NHS
National Institute for
Health and Clinical Excellence

More facts

- QS must be measurable/quantifiable and include a denominator/numerator
- Commissioners are responsible for QS implementation
- End of life care must be considered [NG31 2012 and QS13 2011]
- Implantable cardio defibrillators (ICD) and cardiac resynchronisation therapy (RCT) [TA314 2014]
- An angiotensin receptor-neprilysin inhibitor is available (LCZ696) [McMurray et al NEJM 2014; 371: 993-1004]

Following NICE QS9, Lee…

1. …would benefit from a diuretic ✔
2. …requires a two-week referral for his very high BNP ✖
3. …should continue all his current drugs ✖
4. …would benefit from referral to a heart failure nurse ✔
5. …correctly assumes his GP must follow the quality standard ✖

Audit Idea and Key Points - Heart Failure

AUDIT: Is the referral of patients timely? The number of admissions and could it be improved?

1. Very high BNP or PMH: MI requires urgent referral
2. Review patient 2 weeks after meds changed
3. QS is a responsibility of commissioners

Atrial fibrillation

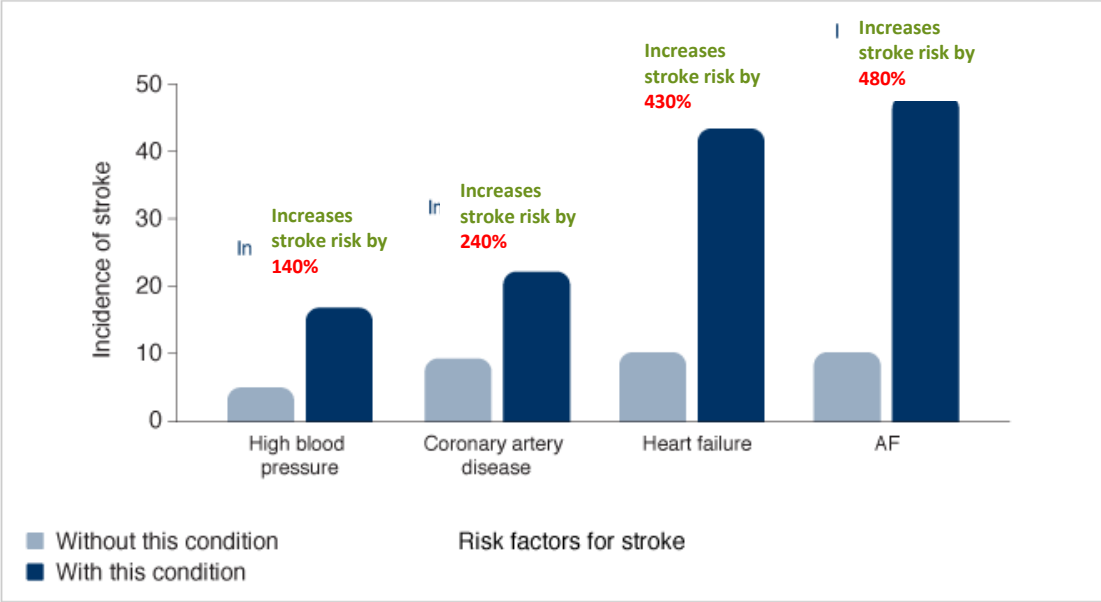
AF relate

AF related stroke – the human and financial cost

- 12,500 strokes per year attributable to AF
  - 4,300 deaths in hospital
  - 3,200 discharges to residential care
  - 8,500 deaths within the first year *(1)*
  - ***Cost to the NHS - over £3 billion a year.*** *(2)*
  - ***Average cost of AF related stroke per patient - over £10,000*** *(3)*
  - ***Extra costs per annum if the stroke is disabling – £7,600*** *(3)*

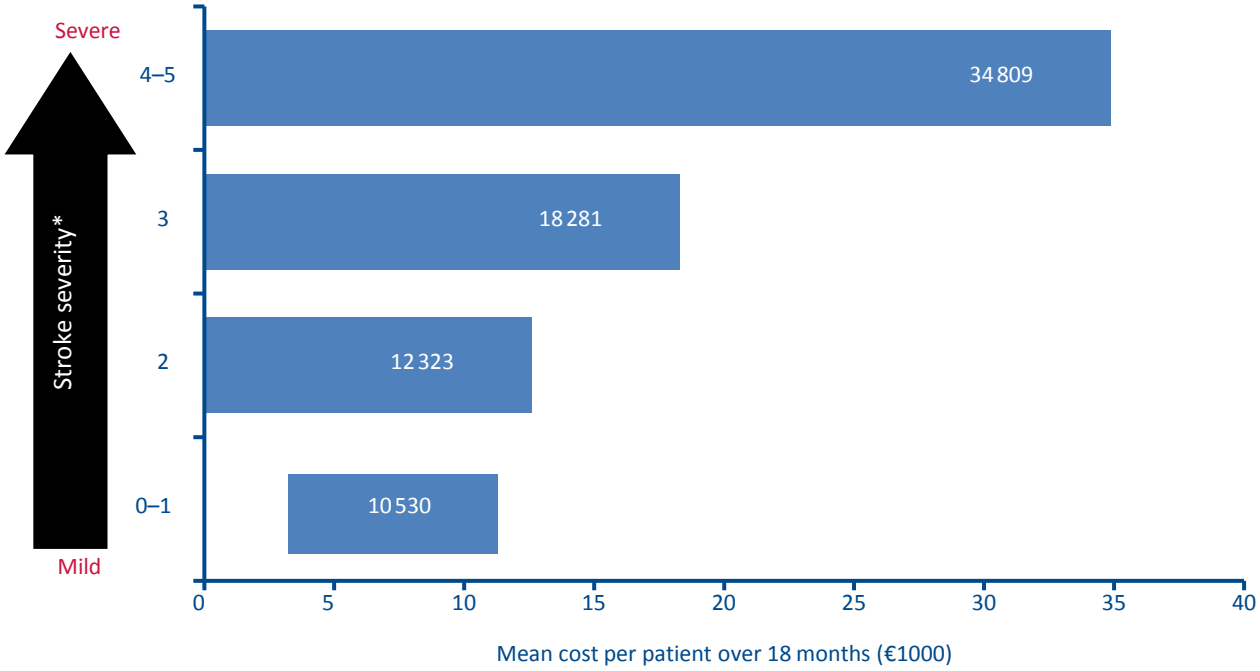
1) Heart and Stroke Improvement. Commissioning for Stroke Prevention in Primary Care - The Role of Atrial Fibrillation, NHS Improvement: www.improvement.nhs.uk
2) National Audit Office. Department of Health: Progress in improving stroke care. February 2010. http://www.nao.org.uk/publications/0910/stroke.aspx
3) Luengo-Fernandez R, Yiin G, Gray AM, Rothwell PM. Population-based study of acute- and long-term health and social care costs after stroke in patients with AF. BI Data on File DBG11-03. Submitted to Stroke March 2011

AF massively increases stroke risk

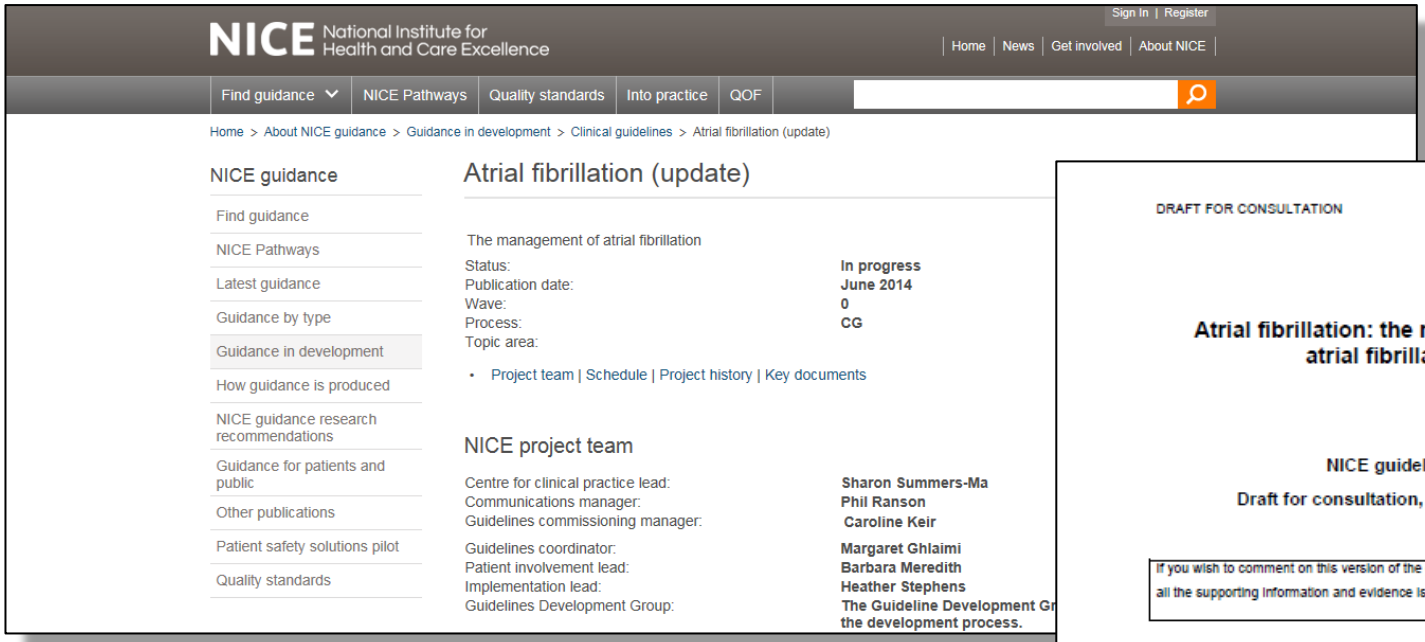


http://www.preventaf-strokecrisis.org/report/chapter1/

Stroke severity increases costs



Data for 494 consecutive stroke patients in France; *10-day modified Rankin Scale. Spieler JF et al. Cerebrovasc Dis 2002;13:132–41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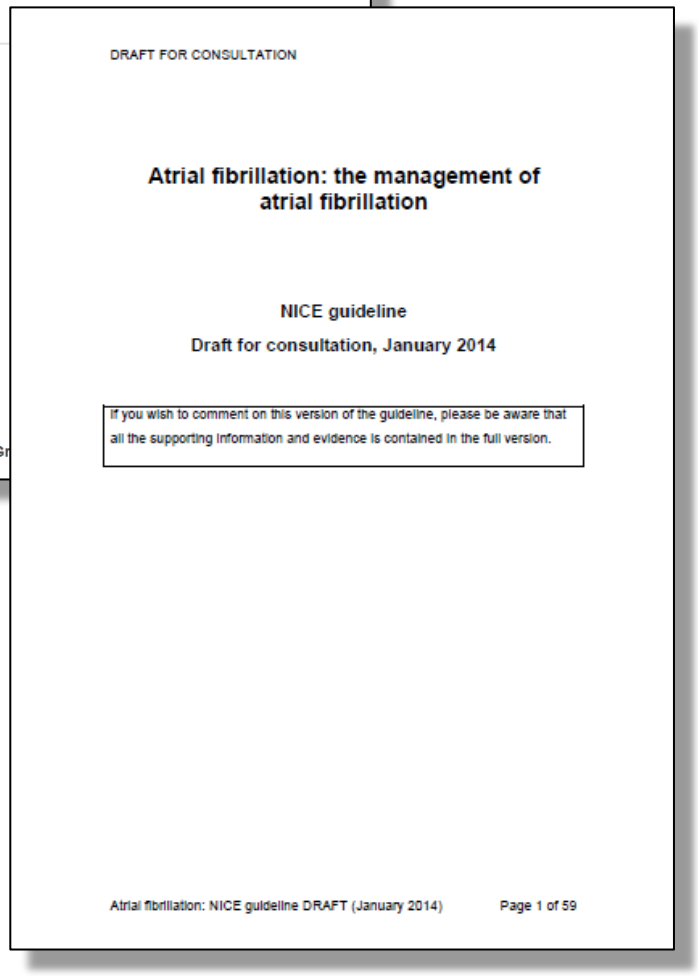
Guidance for patients and public
Other publications
Patient safety solutions pilot
Quality standards
Atrial fibrillation (update)
The management of atrial fibrillation
Status: In progress
Publication date: June 2014
Wave: 0
Process: CG
Topic area:
Project team | Schedule | Project history | Key documents
NICE project team
Centre for clinical practice lead: Sharon Summers-Ma
Communications manager: Phil Ranson
Guidelines commissioning manager: Caroline Keir
Guidelines coordinator: Margaret Ghlaimi
Patient involvement lead: Barbara Meredith
Implementation lead: Heather Stephens
Guidelines Development Group: The Guideline Development Gr
the development process.


DRAFT FOR CONSULTATION
Atrial fibrillation: the management of atrial fibrillation
NICE guideline
Draft for consultation, January 2014
If you wish to comment on this version of the guideline, please be aware that all the supporting information and evidence is contained in the full version.
Atrial fibrillation: NICE guideline DRAFT (January 2014) Page 1 of 59

Rate or rhythm control?

- Rate control should be initial 1st line strategy for most AF patients unless:
    - AF with reversible cause
    - New onset AF (esp if < 65)
    - HF thought to be primarily caused by AF
    - Clinical judgement suggests rhythm control may be more suitable
- If drug Rx has failed to control symptoms:
    - Ablation should be:
        - offered to patients with paroxysmal AF
        - considered for patients with persistent AF

Rhythm control requires anticoagulation for ≥3 weeks prior to cardioversion unless AF onset < 48hrs
Subsequent anticoagulation is dependent on stroke risk regardless of perceived effectiveness of rhythm control

NICE 2014. Atrial Fibrillation: management https://www.nice.org.uk/guidance/cg180

Rate control strategy

[Digoxin should only be considered as monotherapy in sedentary patients]

First Line monotherapy:

Beta Blocker	**or**	**Rate-limiting CCB**
Atenolol, bisoprolol		Diltiazem, verapamil

Aim for ventricular rate 80-90 bpm at rest

- If rate control suboptimal on maximum tolerated dose of monotherapy, use **digoxin** as an adjunct.
- Refer if remains suboptimal.

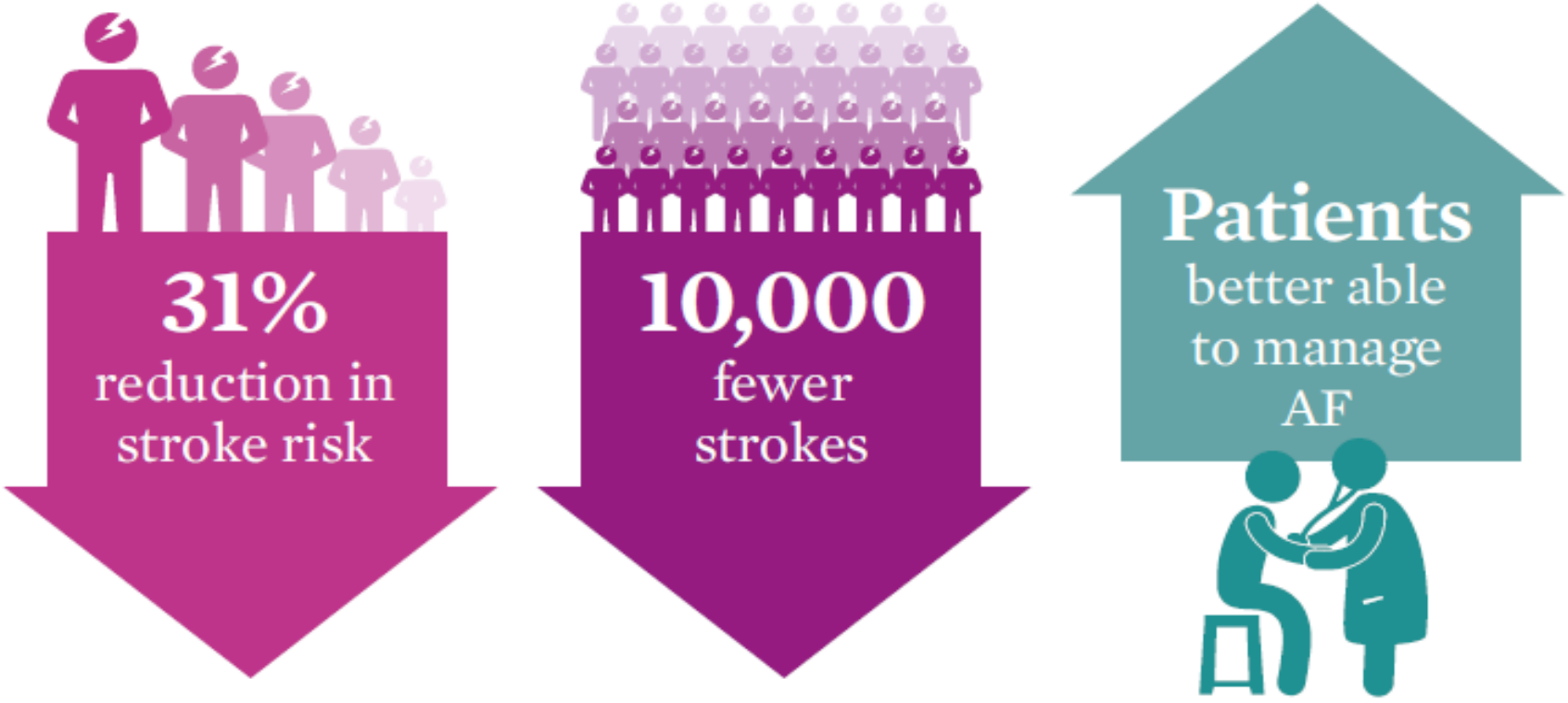
NICE 2014. Atrial Fibrillation: management https://www.nice.org.uk/guidance/cg180

In 2014 NICE CG 180 recommended:[8]

- NOACs are offered as an equal option alongside warfarin
- The choice of anticoagulant is based on the patient's clinical features and personal preferences
- Aspirin monotherapy is NOT an effective option for stroke prevention

NICE estimated that implementing CG180 could result in:[13]

- A 31% reduction in the risk of stroke for people with AF
- Approximately 10,000 fewer AF-related strokes per year
- People with AF better able to manage their condition



Mrs AB

- 69 years old
- Active (keen gardener), ex-smoker
- Stable intermittent claudication at 200 yards
- No PMH heart failure, hypertension, stroke, TIA, diabetes mellitus
- Diagnosed November 2015 via Flu vaccination programme
- Currently taking aspirin and atorvastatin 20mg
- 'Put off' warfarin by close friend

- IS SHE AT HIGH RISK FOR AF-RELATED STROKE?

Replace $CHADS_2$ with CHA_2DS_2-VASc

1.4 Assessment of stroke and bleeding risks

Stroke risk

1.4.1 Use the CHA_2DS_2-VASc stroke risk score to assess stroke risk in people with any of the following:

 symptomatic or asymptomatic paroxysmal, persistent or permanent atrial fibrillation atrial flutter a continuing risk of arrhythmia recurrence after cardioversion back to sinus rhythm. **[new 2014]**

- If **$CHA_2DS_2VASc \geq 2$ offer** anticoagulation
- If **$CHA_2DS_2VASc = 1$ consider** anticoagulation
  - **"Offer"** = confident that for the **vast majority** of pts an intervention will do more good than harm and be cost-effective
  - **"Consider"** = confident that for **most** pts an intervention will do more good than harm and be cost-effective

NICE 2014. Atrial Fibrillation: management https://www.nice.org.uk/guidance/cg180

Stroke Risk Assessment With CHADS

$CHADS_2$ criteria	Score
Congestive heart failure	1
Hypertension	1
Age >75 yrs	1
Diabetes mellitus	1
Stroke / transient ischaemic attack	2

$CHADS_2$ total score	Risk of stroke (%/year) (95% CI)*
0	1.9 (1.2–3.0)
1	2.8 (2.0–3.8)
2	4.0 (3.1–5.1)
3	5.9 (4.6–7.3)
4	8.5 (6.3–11.1)
5	12.5 (8.2–17.5)
6	18.2 (10.5–27.4)

*Adjusted stroke rate = expected stroke rate per 100 patient-
based on exponential survival model, assuming aspirin not ta

MRS AB'S CHADS SCORE IS 0

Is she at high risk?

CHA_2DS_2VASc &

CHA_2DS_2-VASc total score	Percent AF population	Stroke & TE event rate at 1 year follow up*
0	8.4	0.8%
1	12.0	2.0%
2	18.2	3.7%
3	23.0	5.9%
4	18.7	9.3%
5	11.7	15.3%
6	5.7	19.7%
7	1.9	21.5%
8	0.4	22.4%
9	0.1	23.6%

TE = thromboembolism (includes peripheral artery embolism, ischaemic stroke and pulmonary embolism)
*Without anticoagulation therapy. Actual rates of stroke in contemporary cohorts may vary from these estimates.

Adapted from Lip GYF *et al. Stroke* 2010;**41**:2731-2738; Olesen J *et al. BMJ* 2011;**342**:d124 and Euro Heart Survery on Atrial Fibrillation.

MRS AB'S CHADS-VASC SCORE IS 3

Always check CHADS-VASC if CHADS score is 0 or 1!

QOF 2016-7

Atrial fibrillation (AF)

Indicator	Points	Achievement thresholds
Records		
AF001. The contractor establishes and maintains a register of patients with atrial fibrillation	5	
Ongoing management		
AF006. The percentage of patients with atrial fibrillation in whom stroke risk has been assessed using the CHA2DS2-VASc score risk stratification scoring system in the preceding 12 months (excluding those patients with a previous CHADS2 or CHA_2DS_2-VAS_c score of 2 or more) *NICE 2014 menu ID: NM81*	12	40-90%
AF007. In those patients with atrial fibrillation with a record of a CHA_2DS_2-VAS_c score of 2 or more, the percentage of patients who are currently treated with anti-coagulation drug therapy *NICE 2014 menu ID: NM82*	12	40-70%

For AF007, patients with a previous score of 2 or above using CHADS2, recorded prior to 1 April 2015 will be included in the denominator.

HAS-BLED

Letter	Clinical characteristic[a]	Points awarded
H	Hypertension	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INRs	1
E	Elderly (e.g. age >65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Maximum 9 points

Bleeding risk

- Use the HAS-BLED score to assess the risk of bleeding in people who are starting or have started anticoagulation. Offer modification and monitoring of the following risk factors:
  - uncontrolled hypertension
  - poor control of international normalised ratio (INR) ('labile INRs')
  - concurrent medication, for example concomitant use of aspirin or a non-steroidal anti-inflammatory drug (NSAID)
  - harmful alcohol consumption. **[new 2014]**

NICE 2014. Atrial Fibrillation: management https://www.nice.org.uk/guidance/cg180

It all depends on your perspective

Risk-benefit and risk of falls

- 1.4.3 When discussing the benefits and risks of anticoagulation, tell the person that:
  - for most people the benefit of anticoagulation outweighs the bleeding risk
  - for people with an increased risk of bleeding the benefit of anticoagulation may not always outweigh the bleeding risk, and careful monitoring of bleeding risk is important. **[new 2014]**

NICE 2014. Atrial Fibrillation: management https://www.nice.org.uk/guidance/cg180

- 1.4.4 Do not withhold anticoagulation solely because the person is at risk of having a fall. **[new 2014]**

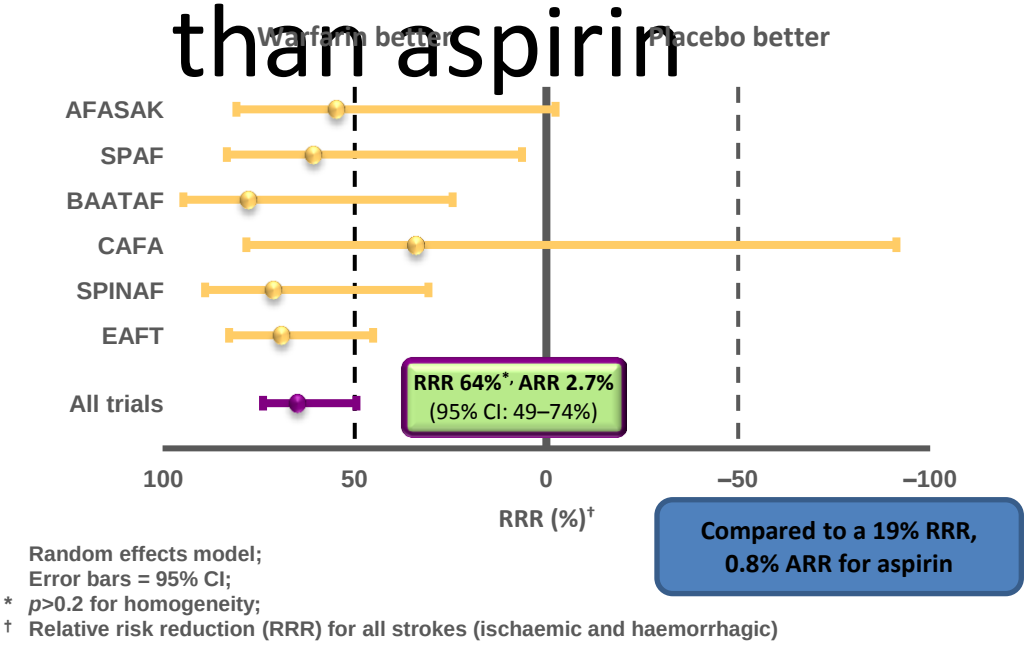
The use of aspirin monotherapy for SPAF

- 1.5.13 Do not offer aspirin monotherapy solely for stroke prevention to people with atrial fibrillation.

NICE 2014. Atrial Fibrillation: management https://www.nice.org.uk/guidance/cg180

[new 2014]

Anticoagulation works MUCH better than aspirin



Random effects model;
Error bars = 95% CI;

* *p*>0.2 for homogeneity;

† Relative risk reduction (RRR) for all strokes (ischaemic and haemorrhagic)

And as for being safer in terms

Haemorrhage fatal and non fatal	warfarin	risk/yr	Aspirin	risk/yr	Warf vs. Asp Relative risk	p
Major extracranial haemorrhage	18	1.4%	20	1.6%	0.87	0.67
Other hospital admission for haemorrhage	24	1.8%	19	1.5%	1.22	0.52
All major haemorrhages (including extracranial & haemorrhagic stroke)	25	1.9%	25	2.0%	0.96	0.90

BAFTA. Lancet 2007;370:493

8. The definition of poor anticoagulation

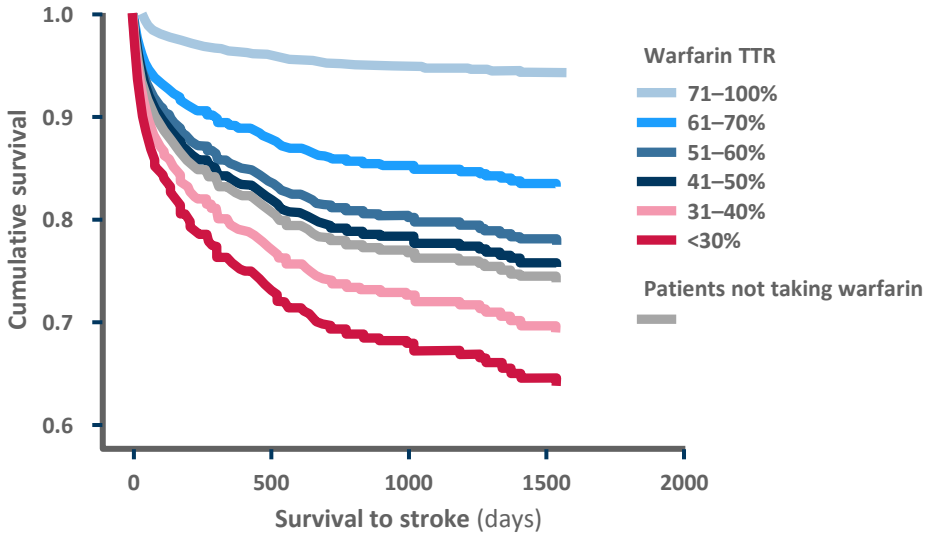
1.5.10 Reassess anticoagulation for a person with poor anticoagulation control shown by any of the following:

- 2 INR values higher than 5 or 1 INR value higher than 8 within the past 6 months
- 2 INR values less than 1.5 within the past 6 months
- TTR less than 65%. **[new 2014]**

NICE 2014. Atrial Fibrillation: management https://www.nice.org.uk/guidance/cg180

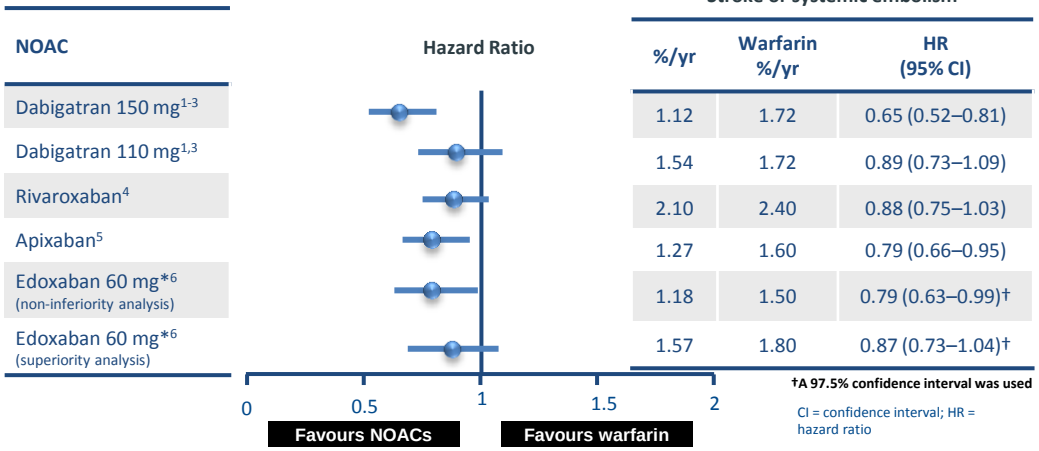
Time in therapeutic range matters

Survival time to post-atrial fibrillation stroke by time in therapeutic range (TTR)
(patients at moderate or high risk of stroke $CHADS_2$ ≥2)



Morgan CL *et al. Thrombosis Research.* 2009;**124**:37–41.

NOAC trial outcomes: Stroke and systemic embolism vs warfarin



Stroke or systemic embolism		
%/yr	Warfarin %/yr	HR (95% CI)
1.12	1.72	0.65 (0.52–0.81)
1.54	1.72	0.89 (0.73–1.09)
2.10	2.40	0.88 (0.75–1.03)
1.27	1.60	0.79 (0.66–0.95)
1.18	1.50	0.79 (0.63–0.99)†
1.57	1.80	0.87 (0.73–1.04)†

†A 97.5% confidence interval was used

CI = confidence interval; HR = hazard ratio

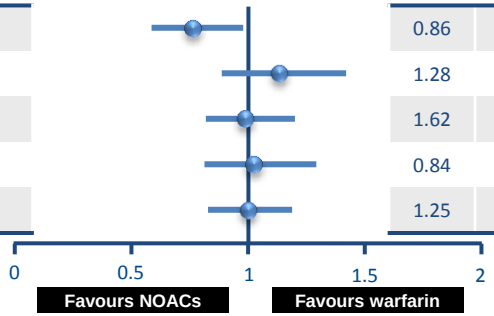
*There was a dose reduction to 30mg in the 60mg arm; 30mg arm data are not shown as this is not a licensed dosing regimen.
Non-Inferiority – Modified intention-to-treat population in the treatment period. Superiority – Intention-to-treat population in the overall study period.

Clinical trial data for information only - no clinical conclusions should be drawn. Please refer to individual product SPCs for further information. Analyses were performed on data from the intention-to-treat population

1. Connolly SJ et al. N Engl J Med. 2009;361:1139–51; **2.** Connolly SJ et al. N Engl J Med. 2010; 363:1875-6; **3**. Connolly SJ et al. N Engl J Med. 2014;371:1464–5; **4.** Patel MR et al. NEJM. 2011;365:883–91; **5**. Granger et al. N Eng J Med 2011;365:981-92; **6.** Giugliano et al. N Engl J. 2013;369:2093–104.

NOAC trial outcomes: Ischaemic stroke vs warfarin

NOAC	Hazard Ratio	Ischaemic stroke %/yr	Warfarin %/yr	HR (95% CI)
Dabigatran 150 mg[1,2]		0.86	1.14	0.76 (0.59–0.98)
Dabigatran 110 mg[1,2]		1.28	1.14	1.13 (0.89–1.42)
Rivaroxaban[3]		1.62	1.64	0.99 (0.82–1.20)
Apixaban[4]		0.84	0.82	1.02 (0.81–1.29)
Edoxaban 60 mg*[5]		1.25	1.25	1.00 (0.83–1.19)†



†A 97.5% confidence interval was used

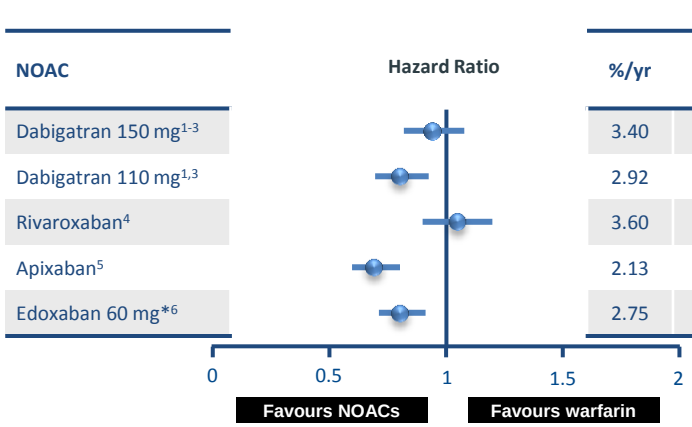
CI = confidence interval; HR = hazard ratio

*There was a dose reduction to 30mg in the 60mg arm; 30mg arm data are not shown as this is not a licensed dosing regimen. A 97.5% confidence interval was used

Clinical trial data for information only - no clinical conclusions should be drawn. Please refer to individual product SPCs for further information. Analyses were performed on data from the intention-to-treat population

1. Connolly SJ et al. N Engl J Med. 2009;361:1139–51; **2.** Pradaxa Summary of Product Characteristics. Available online at: http://www.medicines.org.uk/emc; **3.** Mahaffey KW, Fox KAA. Presented at American Heart Association Scientific Sessions 2010: Abstract 21829; **4.** Lopes RD et al. Lancet. 2012;1749-58; **5.** Giugliano et al. N Engl J. 2013;369:2093–104.

NOAC trial outcomes: Major bleeding versus warfarin



NOAC	Major bleeding %/yr	Warfarin %/yr	HR (95% CI)
Dabigatran 150 mg[1-3]	3.40	3.61	0.94 (0.82–1.08)
Dabigatran 110 mg[1,3]	2.92	3.61	0.80 (0.70–0.93)
Rivaroxaban[4]	3.60	3.40	1.04 (0.90–1.20)
Apixaban[5]	2.13	3.09	0.69 (0.60–0.80)
Edoxaban 60 mg*[6]	2.75	3.43	0.80 (0.71–0.91)

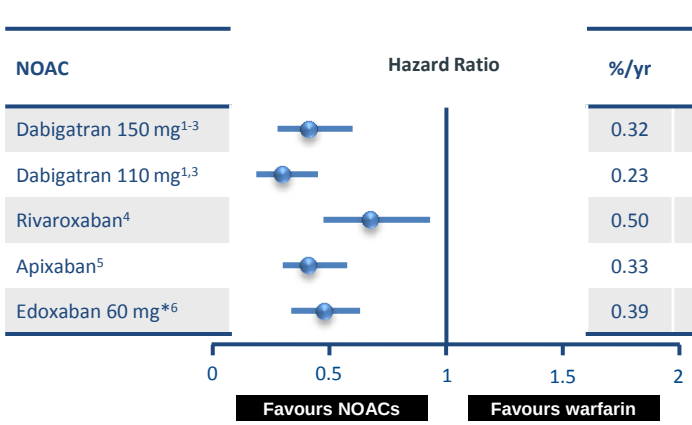
CI = confidence interval; HR = hazard ratio

*There was a dose reduction to 30mg in the 60mg arm; 30mg arm data are not shown as this is not a licensed dosing regimen.

Clinical Trial Data for information only - no clinical conclusions should be drawn. Please refer to individual product SPCs for further information.

1. Connolly SJ et al. N Engl J Med. 2009;361:1139–51; **2.** Connolly SJ et al. N Engl J Med. 2010; 363:1875-6; **3.** Connolly SJ et al. N Engl J Med. 2014;371:1464–5; **4.** Patel MR et al. NEJM. 2011;365:883–91; **5.** Granger et al. N Eng J Med 2011;365:981-92; **6.** Giugliano et al. N Engl J. 2013;369:2093–104.

NOAC trial outcomes: Intracranial bleeding vs warfarin



NOAC	Intracranial bleeding %/yr	Warfarin %/yr	HR (95% CI)
Dabigatran 150 mg[1-3]	0.32	0.76	0.41 (0.28–0.60)
Dabigatran 110 mg[1,3]	0.23	0.76	0.30 (0.19–0.45)
Rivaroxaban[4]	0.50	0.70	0.67 (0.47–0.93)
Apixaban[5]	0.33	0.80	0.42 (0.30–0.58)
Edoxaban 60 mg*[6]	0.39	0.85	0.47 (0.34–0.63)

CI = confidence interval; HR = hazard ratio

*There was a dose reduction to 30mg in the 60mg arm; 30mg arm data are not shown as this is not a licensed dosing regimen.

Clinical Trial Data for information only - no clinical conclusions should be drawn. Please refer to individual product SPCs for further information.

1. Connolly SJ et al. N Engl J Med. 2009;361:1139–51; **2.** Connolly SJ et al. N Engl J Med. 2010; 363:1875-6; **3.** Connolly SJ et al. N Engl J Med. 2014;371:1464–5; **4.** Patel MR et al. NEJM. 2011;365:883–91; **5.** Granger et al. N Eng J Med 2011;365:981-92; **6.** Giugliano et al. N Engl J. 2013;369:2093–104.

Safe prescribing of NOACs

- Switching from warfarin to a NOAC:
  - **INR < 2.0:** start NOAC immediately
  - **INR 2.0-2.5:** start NOAC the next day
  - **INR > 2.5:** Need to estimate from INR value when INR likely to drop below threshold ($t_{1/2}$ warfarin 36-42h)
- Switching from NOAC to warfarin:
  - Initiate warfarin with NOAC concomitantly until INR ≥ 2
  - Re-test INR 24hrs after NOAC discontinuation
- Missed doses:
  - Pt should take forgotten dose up till 6h (if bd NOAC) or 12h (if od NOAC) after scheduled intake
  - Otherwise skip dose and take next dose as scheduled

Patients with AF and CAD may need combination Rx:

Oral Anticoagulant (OAC) + Antiplatelet(s) (AP)

- **ESC 2014 guidance:**
  - For patients with AF and stable CAD (with no ACS or PCI within 1 year):
    - **Anticoagulant only will suffice**
  - For patients with AF who have had a PCI or ACS within a year:
    - **1st 4 weeks to 6 months:**
      - **Anticoagulation plus dual antiplatelet Rx** (exact period depends on whether stent is used, type of stent and bleeding risk)
    - **Until 12 months:**
      - **Anticoagulation plus single antiplatelet Rx** (aspirin or clopidogrel)

Minimal data available for NOACs with newer APs (ie ticagrelor & prasugrel)

  - Dual or triple therapy ↑↑ bleeding risk
  - (Discuss with cardiologist before stopping any AP < 1 year post PCI/ACS)

Audit Idea and Key Points - AF

AUDIT: Patients on warfarin with poor INR control

1. Treat CHA_2DS_2-VASc >2 with anticoagulation
2. HAS-BLED is a safety instrument, not a reason to deprive a patient of anticoagulation
3. Time In Therapeutic Range must be followed up and acted upon

Thank You