Case studies in atrial fibrillation – the ideal pathway

Nigel Brown and Alun Edwards
Consultant Cardiologist and Lead GP NCN
Aneurin Bevan Health Board
May 2015
How common is it?

• Commonest sustained arrhythmia
• Prevalence 1.6-2% population
• UK Incidence: ~ 100,000 new cases/annum
• Paroxysmal AF ~ 35-66% cases
• AF in: 15-20% CVA, 2-8% TIAs
• Avg GP – 20-25 cases, 2-3 new/year

RCP Edinburgh, 1999; Bandolier, 2002; Peters et al, 2002; Sudlow et al, 1998
Prevalence

- Prevalence: 1.5%-3% of patients in their 60s
  5%-7% of patients in their 70s
  10% of patients in their 80s

Incidence to double over next 40 yrs

Complications/Prognosis 1

• Tachycardia/↓cardiac output
  – poor exercise tolerance
  – myocardial ischaemia
  – dyspnoea/cardiac failure
  – tachycardia induced cardiomyopathy

• Thromboembolism – stroke

• Mortality 2x that general population
Mortality/Morbidity from stroke secondary to AF

- 32% death 30 days, 50% 1 year
- Larger strokes, 7.6 day longer stay

- ANTICOAGULATION
  - ↓ 64% stroke, ↓ 26% mortality

- 7000 strokes avoided
- 2,100 lives saved/year (NHS England) with OAC treatment
Comment

These data are similar to the last National Sentinel Stroke Audit and reveal that there are still major issues in primary and secondary care about ensuring that patients have effective stroke prevention. Almost one fifth of patients are in atrial fibrillation (AF) on admission. Only 41.2% of patients in AF on admission are taking anticoagulants with over 34% taking only antiplatelet drugs which are considered ineffective for patients in AF. Over a quarter of patients have had a prior stroke or TIA.
Guidelines/Consensus in 2014

Atrial fibrillation: the management of atrial fibrillation
Issued: June 2014, last modified: August 2014
NICE clinical guideline 180

NICE Implementation Collaborative Consensus
Supporting local implementation of NICE guidance on use of the novel (non-Vitamin K antagonist) oral anticoagulants in non-valvular atrial fibrillation

All Wales Advice on the Role of Oral Anticoagulants
All Wales Medicines Strategy Group
Grŵp Stratewmwriaeth Meddwlmaethau Cymru Gyfan

September 2014
Background

• Typical primary care presentations
• No right or wrong answers
• Consensus views to inform pathway development work – Cardiac Networks
• Learning points
Objectives

• Diagnosis?
• ECG features and anomalies....
• What to do next?
• Investigations to perform?
• Would you /should you refer?
• How would you treat (afternoon)?
Case 1

- 72 year old female
- Attends for medication review
- PMHx
  - T2DM, Hypothyroid, Hypertension OA, #NOF 2014 after fall in garden
  - Varicose eczema/dependent oedema
- Social Hx
  - Ex smoker – glass of wine with Sunday lunch
  - Walks with stick
  - Lives with husband who has Parkinsons Disease
Drug history

- MF 500mg bd
- Perindopril 4mg od
- Atorvastatin 10mg od
- Ibuprofen 400mg tds PRN
- Co-codamol 30/500mg 2 PRN QDS
- Hypromellose eye drops
- Diprobase
- Saxagliptin 5mg od
- Amodipine 5mg od
- Thyroxine 50mcg od
Examination

- BMI 32
- BP 145/85
- Pulse irregular – rate approx 90-100
- HS1+2+0
- Varicose eczema and dependent oedema
• What would you do next?
• What investigations would you perform?
• Are there any special considerations here?
• Would you refer?
• How would you treat?
10 steps *before* you refer

Rosie Heath, Gregory Lip; Updated October 2011
www.bjcardio.co.uk/files/extra/FINAL_Handbook18_DEC.pdf
10 steps before you refer

The 10 steps before you refer for atrial fibrillation

Step 1. Diagnose AF (page 7)
- Opportunistically screen for AF whenever possible (e.g. clinical visits) as the condition is often undetected
- Confirm diagnosis with an ECG

Step 2. Establish duration and type of AF (page 6)
- Is the AF of recent onset, paroxysmal, persistent or permanent type?
- The correct classification helps guide treatment and management

Step 3. Assess symptom severity (page 9)
- Determine CHA2DS2-VASc score in the clinical evaluation of patient
- Consider whether a rhythm or rate control strategy is most appropriate

Step 4. Establish the cause (page 10)
- Take a careful history to identify any possible precipitant causes of AF

Step 5. Enquire about relevant comorbidities (page 11)
- These will be relevant to the use of anticoagulation therapy
- Assess bleeding risk using the HASBLED score

Step 6. Undertake a physical examination of the patient (page 12)

Step 7. Undertake the following tests (page 12)
- FBC and clotting screen, LFTs, TFTs, glucose, cholesterol
- Echocardiography can be helpful in some cases
- Raised BNP results should be interpreted with care

Step 8. Reduce symptoms by prescribing a rate-controlling medication (page 13)
- For patients asymptomatic on presentation, start a rate control medication before referral
- It is important to take a holistic approach to AF management and treatment looking at patient symptoms and lifestyle

Step 9. Start the patient on appropriate anticoagulation (page 14)
- Start appropriate antithrombotic therapy without delay discussing carefully the risks and benefits to the patient
- Assess stroke risk using CHA2DS2-VASc scoring to help determine the "truly low-risk" patient with AF

Step 10. Carefully consider the reason for referral (page 18)
- Is the referral still necessary once above protocol has been followed?
- Some patients can be managed in primary care. Others will need referral to a cardiologist or electrophysiologist

Rosie Heath, Gregory Lip; Updated October 2011
www.bjcardio.co.uk/files/extra/FINAL_Handbook18_DEC.pdf
Diagnosis?

- Take a pulse!
- Encourage *all healthcare* workers to do the same at all opportunities

- **ECG** – *there and then, not later!*

- Holter monitor versus event recorders
- Pacemaker or ICD interrogation
Opportunistic Screening

People over 65 should be screened for atrial fibrillation throughout the UK, say stroke specialists

Poll BMJ March 2012: 60% support screening for over 65’s
Typical – 12 lead ECG

12 lead ECG: absence P waves, chaotic baseline, irregular ventricular rate
Tricki(er) ECG’s....
ECG 1: What does this show?
Tip....

- Caution with interpretation software .......... Long rhythm strip.....
ECG 3

40yr old man limiting dyspnoea for 6 weeks. What does the ECG show and what would you do?
ECG 5

80 yr old lady with sudden onset palpitations associated with SOB. Clinical CCF with a murmur. What does the ECG show?
ECG 6: A 23 year old man complains of palpitations. What is the ECG diagnosis?
Symptoms

• **Asymptomatic** – one third patients
  - (Asymptomatic/symptomatic episodes 12:1)

• *Palpitations*
• Chest pain
• Breathlessness
• Fatigue/impaired exercise tolerance
Causes of atrial fibrillation

**Structural heart disease**
- Hypertension (more than 14% cases)
- Coronary artery disease
- Mitral valve disease
- Cardiomyopathy (dilated, hypertrophic, restrictive)
- Congenital heart disease (especially ASD)
- Pericarditis (acute, constrictive, postcardiac surgery)

**Non-structural heart disease**
- Pulmonary disease (COPD, pneumonia, PE)
- OSA
- Thyrotoxicosis
- Acute alcohol ingestion “holiday heart synd”
- Methylxanthine (theophylline, caffeine)
- Systemic illness (sepsis, malignancy, electrolyte disturbances)
- “Lone” atrial fibrillation.. 15% all cases
Remember .......
Investigation - General Points

- FBC, U&E, LFTs, TFTs.
- NB Alcohol xs
- CXR
- Echocardiography
  - Don’t need to decide on anticoagulation
  - Assess LVH
  - LV dysfunction (EF < 40%)
  - Valve disease
  - ? LA size

No need for echo if multiple co-morbidity/very elderly/ frail and result would not influence treatment.
1.1.4 Perform transthoracic echocardiography (TTE) in people with atrial fibrillation:

- for whom a baseline TTE is important for long-term management

- for whom a rhythm-control strategy that includes cardioversion is being considered

- in whom there is a high risk or a suspicion of underlying structural/functional heart disease (such as heart failure or heart murmur) that influences their subsequent management (for example, choice of antiarrhythmic drug)

- in whom refinement of clinical risk stratification for antithrombotic therapy is needed [2006, amended 2014]
1.1.5

- Do not routinely perform TTE solely for the purpose of further stroke risk stratification in people with atrial fibrillation for whom the need to initiate anticoagulation therapy has already been agreed on appropriate clinical criteria. [2006, amended 2014]

*In practice NO need for echo if multiple co-morbidity/very elderly/ frail and/or result would not influence treatment.*
Lenient versus Strict Rate Control in Patients with AF - RACE 11 study

Resting heart rate <110 beats/min … as effective as

strict control (HR < 80 at rest and <110 during moderate exercise)

*Van Gelder et al. NEJM 2010
Aspirin….

- Do not offer aspirin monotherapy solely for stroke prevention to people with atrial fibrillation – new NICE 2014
# GMS Contract QOF Wales 2014-15

<table>
<thead>
<tr>
<th>AF Indicator (Wales)</th>
<th>Points</th>
<th>Achievement thresholds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Records</td>
<td></td>
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<tr>
<td>AF001. The contractor establishes and maintains a register of patients with AF</td>
<td>2</td>
<td></td>
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<tr>
<td>Ongoing management</td>
<td></td>
<td></td>
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<tr>
<td>AF002. The percentage of patients with AF in whom stroke risk has been assessed using the CHADS(_2) risk stratification scoring system in the preceding 3 years (excluding those whose previous CHADS(_2) score is greater than 1)</td>
<td>5</td>
<td>50–90%</td>
</tr>
<tr>
<td>AF004. In those patients with AF whose latest record of a CHADS(_2) score is greater than 1, the percentage of patients who are currently treated with anti-coagulation therapy</td>
<td>6</td>
<td>40–70%</td>
</tr>
<tr>
<td>AF005W. In those patients with AF in whom there is a record of a CHADS(_2) score of 1, in the preceding 3 years, the percentage of patients who are currently treated with anti-coagulation drug therapy or anti-platelet therapy</td>
<td>3</td>
<td>54–94%</td>
</tr>
</tbody>
</table>

**QOF amendment August 2014 (Wales)**

GP contractors are to be awarded full points for 2014/15 for AF002, AF004, and AF005W to support the change of a risk assessment tool for new patients, to begin to update risk assessment for patients already on the register and to review all patients on aspirin monotherapy (14 points). GP contractors must confirm that all patients on aspirin monotherapy have been reviewed by 31 March 2015. The linked CHA\(_2\)DS\(_2\)-VASc risk assessment tool should now be adopted.
How do I risk-assess AF patients simply?
Stroke risk assessment with CHADS$_2$

<table>
<thead>
<tr>
<th>CHADS$_2$ criteria</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive heart failure</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>Age &gt;75 yrs</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1</td>
</tr>
<tr>
<td>Stroke / transient ischaemic attack</td>
<td>2</td>
</tr>
</tbody>
</table>

**CHADS$_2$ score**

1 Gage BF *et al.* JAMA 2001;285:2864–70.
2 Based on data from Gage BF *et al.* JAMA 2001;285:2864–70.
CH\textsubscript{A}2DS\textsubscript{2}-VASc – NICE 2014

<table>
<thead>
<tr>
<th>CH\textsubscript{A}2DS\textsubscript{2}-VASc criteria</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive heart failure/ left ventricular dysfunction</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>Age (\geq 75) yrs</td>
<td>2</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1</td>
</tr>
<tr>
<td>Stroke/transient ischaemic attack/TE</td>
<td>2</td>
</tr>
<tr>
<td>Vascular disease (prior myocardial infarction, peripheral artery disease or aortic plaque)</td>
<td>1</td>
</tr>
<tr>
<td>Age 65–74 yrs</td>
<td>1</td>
</tr>
<tr>
<td>Sex category (i.e. female gender)</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CH\textsubscript{A}2DS\textsubscript{2}-VASc total score</th>
<th>Rate of stroke/other TE (%/year)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td>4</td>
<td>4.0</td>
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<tr>
<td>5</td>
<td>6.7</td>
</tr>
<tr>
<td>6</td>
<td>9.8</td>
</tr>
<tr>
<td>7</td>
<td>9.6</td>
</tr>
<tr>
<td>8</td>
<td>6.7</td>
</tr>
<tr>
<td>9</td>
<td>15.2</td>
</tr>
</tbody>
</table>

* Theoretical rates without therapy: assuming that warfarin provides a 64% relative reduction in TE risk (2.7% ARR), based on Hart et al.

TE = thromboembolism

NB Female sex alone not independent risk factor

Guidance from ESC (2012) and NICE 2014 saw the demotion of aspirin (at last)

<table>
<thead>
<tr>
<th>Risk category</th>
<th>CHA$_2$DS$_2$-VASc score</th>
<th>Recommended antithrombotic therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>One ‘major’ risk factor or ≥2 ‘clinically relevant non-major’ risk factors</td>
<td>≥2</td>
<td>Oral anticoagulant (OAC)</td>
</tr>
<tr>
<td>One ‘clinically relevant non-major’ risk factor (not sex)</td>
<td>1</td>
<td>Consider anticoagulation (taking into account bleeding risk)</td>
</tr>
<tr>
<td>No risk factors</td>
<td>0</td>
<td>No antithrombotic therapy.</td>
</tr>
</tbody>
</table>
## Bleeding Risk – HAS-BLED Score

<table>
<thead>
<tr>
<th>Letter</th>
<th>Clinical characteristic</th>
<th>Points awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>Abnormal renal and liver function (1 point each)</td>
<td>1 or 2</td>
</tr>
<tr>
<td>S</td>
<td>Stroke</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Bleeding</td>
<td>1</td>
</tr>
<tr>
<td>L</td>
<td>Labile INRs</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Elderly (e.g. age &gt;65 years)</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>Drugs or alcohol (1 point each)</td>
<td>1 or 2</td>
</tr>
</tbody>
</table>

*Maximum 9 points*

H = systolic BP ≥ 160mmHg, A = dialysis, transplant or creat ≥ 200, cirrhosis or AST/ALP ≥ 3x ULN, B = bleeding diathesis/anaemia, L = unstable INRs, D = NSAID’s, anti-platelets, alcohol XS

**Score ≥ 3 = “High Risk” ‘Caution regular review patient required’**

[www.escardio.org](http://www.escardio.org)
"Hold it, I wonder if I might try the warfarin again?"
Case 2

- 62 year old retired businessman
- SOBOE recently – has had to stop playing squash
- No cough, no chest pain
- Planning trip to South East Asia travelling
- PMHx – knee arthroscopy 2009
- DHx – PRN omeprazole 20mg
- SHx – never smoked, occasional alcohol, divorced
• BMI 30
• BP 138/78
• Pulse 100 irregular
• HS1+2+0
• Chest clear
Discussion

• What would you do next?
• What investigations would you perform?
• Are there any special considerations here?
• Would you refer?
• How would you treat?
The arguments for rhythm versus rate control

- Physiologic control of ventricular rate
- Atrial contribution to cardiac output
- Better exercise tolerance
- Thromboembolic risk probably reduced
- Risks of long-term anticoagulation therapy may be avoided, especially if warfarin contraindicated
- Tachycardia-induced cardiomyopathy controlled
AFFIRM study

- RCT 4000 patients with AF and moderate to high risk of stroke. Rate control versus rhythm control.
  - Mean age 69.7 (SD±/− 9 yrs)
  - 70% ↑BP, 38% CAD
  - 356 deaths rhythm control vs 310 rate control
  - 5 yr mortality 23.8%(rhythm) vs 21.3% (rate control) (P 0.08)

AFFIRM Investigators. NEJM 2002;347, 1825-1833
AFFIRM study conclusions

– Treatment of AF with rhythm control strategy offers no advantage over rate control in this age group with risk factors.

– Lower risk adverse effects with rate control

– Anticoagulation should be continued in high risk patients irrespective of successful cardioversion

– However, 15,000 patients screened, 4000 recruited – selected trial population

AFFIRM Investigators. *NEJM* 2002;347, 1825-1833
Indications for attempted elective cardioversion

- Recent onset, lone AF, 1st presentation
- Young age (? < 65yrs)
- Very symptomatic
- Following successful treatment of likely cause (eg. T4 toxicosis, pneumonia etc.)
- Selected patients with Congestive Cardiac Failure (No benefit in AF-CHF study)

Anticoagulation needed for 3-4 weeks before and bare minimum 4+weeks after unless clear onset within 48hrs or TOE guided

General population, 40% SR after 18 months
## Rate control in AF

<table>
<thead>
<tr>
<th>DRUG</th>
<th>Notes</th>
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<tbody>
<tr>
<td>β blockers</td>
<td>Good at ↓ heart rate at rest and exercise/CHD</td>
</tr>
<tr>
<td>Verapamil/Diltiazem</td>
<td>Moderate at ↓ heart rate at rest + exercise.</td>
</tr>
<tr>
<td>Digoxin</td>
<td>Use in sedentary, elderly, heart failure</td>
</tr>
</tbody>
</table>

**If rate uncontrolled on monotherapy**

- Digoxin and β blocker, especially if previous CCF/LV ↓
- Digoxin and verapamil if contra-indication to β blocker eg asthma but verapamil not good in CCF or LV ↓
- Amiodarone – negligible role persistent AF - CCF
Case study 3

• 84 yr old female. Routine BP check
  Mild dyspnoea 6/12, thought “age-related”
  Treated mild hypertension 5 yrs. Type 2 DM. MI 10 years ago. Normal echo last 12 months. Normal bloods.
  Tx: Bendroflumethiazide 2.5mg. Metformin 1g bd.
  3 mechanical falls in last 12 months

  Pulse 112 irreg.  BP 140/74 mmHg. No heart failure
Case study summary

• 82 yr old female. Routine BP check
  Mild dyspnoea 6/12.
  Treated mild hypertension 5 yrs. Type 2 DM. MI 10 years ago. Normal echo last 12 months. Normal bloods.
  Tx: Bendroflumethiazide 2.5mg. Metformin 1g bd.
  3 mechanical falls in last 12 months

CHADS2 score =  3 (5.9% risk)
CHA₂DS₂-VASc =  6 (9.8% risk)
Discussion

• What would you do next?
• What investigations would you perform?
• Are there any special considerations here?
• Would you refer?
• How would you treat?
Who to admit?

- Very symptomatic/unstable/CCF etc – i.e. need urgent rate control
- Syncope
- Acute onset AF in young/structurally normal heart (onset within 24-48hrs)
- Suspected WPW

Remainder, rate control, OAC and (few need OP referral)
A few myths....
Bleeding risk in the elderly

- physicians presumption that risk bleeding high
  eg. Falls, SDH biggest concern - more concern is previous GI bleed, compliance,

- Fall related SDH’s rare with warfarin
- Elderly pt’s mean 1.81 falls/year.
- Elderly overshadowed by risk CVA.
- “Need to fall more than 295 x per year for warfarin not to be optimal treatment”??

- *Do not withhold anticoagulation solely because the person is at risk of having a fall – new, NICE 2014*

Physicians versus patients perspectives on anticoagulation

- Patients deemed as high risk for AF
  - Patients placed more importance on avoidance of stroke than bleeding
  - Physicians varied considerably in risk bleeding they thought was acceptable for specific ↓ stroke risk.

*Physicians less inclined to risk (prefer to avoid bleeding) rather than reduction in stroke risk*

Devereaux et al. *BMJ* 2001; 323:1-7
BAFTA study

- 973 patients aged ≥ 75yrs (mean age 81.5) from 1 care, warfarin vs aspirin. INR range 2-3
- 1° Endpoint fatal/disabling stroke/IC haemorrhage, or systemic embolism
- 70% CHADS₂ 1-2
- 21% patients screened enrolled – selective population
- 40% already on warfarin prior to study
- Lower risk population

- 24 events in warfarin group vs 48 aspirin
- Total haemorrhage 1.9% warfarin vs 2.0% aspirin
- Major extracranial haemorrhage 1.4% warfarin vs 1.6% aspirin

Whom to refer for advice/OP assessment

- When think rhythm control may be best (younger, precipitant)
- Recurrent paroxysmal AF
- Heart failure
- When underlying cause AF may need treatment or surveillance
- Persistently symptomatic
- When in doubt about what's best to do

- MOST PATIENTS MANAGED 1 ± CARE
# The ideal 1-year care pathway and 10 steps before referral

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</tr>
</thead>
<tbody>
<tr>
<td>Diagnose AF</td>
<td>Physical examination</td>
<td>Establish duration and type of AF</td>
<td>Undertake tests FBC, renal, LFT, glucose, TFT’s Echocardiography</td>
<td>Assess symptom severity</td>
<td>Reduce symptoms by rate control</td>
<td>Establish a cause</td>
<td>Counsel and start VKA or NOAC if appropriate Use CHA₂DS₂-VASc HAS-BLED</td>
<td>Review co-morbidities</td>
<td>Carefully consider the reason for referral</td>
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Thank you