Diagnosis with AF – What care and management should all patients receive?

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What is Atrial Fibrillation?

- Atrial fibrillation occurs when abnormal electrical impulses suddenly start firing in the atrium. These impulses override the heart's natural pacemaker, which can no longer control the rhythm of the heart. This causes you to have a highly irregular pulse rate.

- In atrial fibrillation, the heart rate may be over 140 beats a minute, although it can be any speed.
A normal ECG – Normal Sinus Rhythm
Atrial Fibrillation
# CLASSIFICATION

<table>
<thead>
<tr>
<th>TERMINOLOGY</th>
<th>CLINICAL FEATURES</th>
<th>PATTERN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial event (first detected episode)</td>
<td>Usually Symptomatic</td>
<td>May or may not recur</td>
</tr>
<tr>
<td>Paroxysmal</td>
<td>Spontaneous termination &lt; 7 days and most often &lt; 48 hours</td>
<td>Recurrent</td>
</tr>
<tr>
<td>Persistent</td>
<td>Lasting &gt; 7 days</td>
<td>Recurrent</td>
</tr>
<tr>
<td>Permanent</td>
<td>Not terminated</td>
<td>Established</td>
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AF – The Facts

• One in 7 people over 80 is in AF
• One in 10 people over 65 is in AF
• Can be symptomatic or asymptomatic
• If left untreated increases stroke 5 fold
• Only 20% of patients receiving adequate anti-coagulation – warfarin can reduce the risk of stroke by 66%
• It can cause a reduction in Quality of Life
• Equivalent populations in the USA are experiencing a 5% increase in AF
• AF is associated with over 500,000 acute admissions to hospitals each year and is the cause of admission in a further 95,000 cases
Who should treat/ manage my AF

• Primary care - GP, warfarin clinics

• Secondary care – Cardiologist, Electrophysiologist, AF Clinics
Other influencing factors

• Provision of AF services will vary across the UK

• Some areas may have specialist AF clinics run by GPWSI, Specialist Nurses or Cardiologists

• GP practice can vary within regions
When is input required from a cardiac rhythm specialist?

- A large proportion of patients with AF could be managed by their GP in primary care
- In the presence of underlying structural heart disease
- When there are difficulties achieving adequate rate control
- Advice on choice of rhythm control (shared care protocols etc)
- Electrical Cardioversion
- Catheter ablation
- Problems with anticoagulation
- High bleeding risk
AF treatment/ management Pathways

1. **PAF suspected?**
   - **Yes**: PAF confirmed
   - **No**: Normal follow-up

2. **PAF confirmed**
   - **Very infrequent/few symptoms?**
     - **Yes**: Normal follow-up
     - **No**: Exercise-induced PAF, consider B-blockers

3. **Symptoms?**
   - **Yes**: Asymptomatic?
     - **Yes**: Asymptomatic
     - **No**: Consider anti-coagulation
   - **No**: Second line drugs

4. **Frequent, increasing ± severe symptoms**
   - **PAF - no heart disease**
     - **Consider flecainide**
   - **PAF - with heart disease**
     - **Consider amiodarone**

5. **PAF confirmed**
   - **Yes**: Normal follow-up
   - **No**: Normal follow-up
What are the treatment options?

• No treatment

• Drug therapy

• DC cardioversion +/- drugs

• Ablation
AF – Management

• Prevention of Thrombo-Embolism (stroke) – oral anticoagulation such as aspirin or warfarin

• Rate Control – usually drugs called beta blockers or ablation

• Rhythm Control – Drugs such as Amiodarone or Sotalol, DC cardioversion and ablation.

Paroxysmal AF is a warning that a patient will very likely have persistent AF or permanent AF unless something is done to maintain sinus rhythm.
**Prevention of Thrombo-Embolism**

**CHA2DS2-VASc Score**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>Congestive heart failure (or Left ventricular systolic dysfunction)</td>
</tr>
<tr>
<td>H</td>
<td>1</td>
</tr>
<tr>
<td>H</td>
<td>Hypertension: blood pressure consistently above 140/90 mmHg (or treated hypertension on medication)</td>
</tr>
<tr>
<td>A₂</td>
<td>2</td>
</tr>
<tr>
<td>A₂</td>
<td>Age ≥75 years</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>Diabetes Mellitus</td>
</tr>
<tr>
<td>S₂</td>
<td>2</td>
</tr>
<tr>
<td>S₂</td>
<td>Prior Stroke or TIA</td>
</tr>
<tr>
<td>V</td>
<td>1</td>
</tr>
<tr>
<td>V</td>
<td>Vascular disease (e.g. peripheral artery disease, myocardial infarction, aortic plaque)</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>Age 65–74 years</td>
</tr>
<tr>
<td>Sc</td>
<td>1</td>
</tr>
<tr>
<td>Sc</td>
<td>Sex category (i.e. female gender)</td>
</tr>
</tbody>
</table>
Q1: Patient aged > 75?
- Yes: OAC
- No: 

Q2: Does the patient have a history of TIA, stroke or embolism?
- Yes: OAC
- No: 

Q3: Patient gender?
- Male: OAC if two or more risk factors below are present
- Female: OAC if any of the risk factors below is present

Risk factors:
- Age 65-74
- Hypertension
- Vascular disease*
- Heart failure
- Decreased EF
- Diabetes mellitus

*Myocardial infarction, peripheral artery disease or aortic plaque
Oral Anti-coagulation (OAC) Drug Therapy

- **Warfarin** - used in the prevention of thrombosis and thromboembolism, the formation of blood clots in the blood vessels and their migration elsewhere in the body respectively. It was initially introduced in 1948 as a pesticide against rats and mice and is still used for this purpose. In the early 1950s, warfarin was found to be effective and relatively safe for preventing thrombosis and thromboembolism in many disorders. It was approved for use as a medication since 1954.

- Newer OAC’s such as Dabigatran, Rivaroxaban and Apixaban are now available. Patients with a stable INR have little to gain from switching from warfarin.
AF – Management

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DC Cardioversion

The pads are placed on the chest of the patient, or one is placed on the chest and one on the back and these are connected by cables to a defibrillator. A synchronizing function allows the defibrillator to deliver a reversion shock, by way of the pads, of a selected amount of electric current to the safe part of the ECG.
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The ‘trigger’
Pulmonary Vein Isolation (PVI)
Pulmonary Vein Isolation
Who should have it done?
Patient selection – the ideal patient

- <65 years of age
- Highly symptomatic with frequent attacks
- Paroxysmal or recently persistent AFib
- Multiple AADs ineffective or not tolerated
- Structurally normal heart
- No other comorbidity
- Motivated and aware of complications
Not quite so ideal

• 60-70 years of age
• Persistent/permanent AFib
• Structural heart disease
  – Mitral valve disease
  – Hypertensive heart disease
  – Coronary artery disease
  – Previous TIA/stroke
Not ideal

- >70 years of age
- Chronic AFib of many years duration
- Significant structural heart disease
  - Major valve disease
  - Heart failure
- Significant comorbidities
  - COPD
  - Renal failure
Before ablation: AF surgery - The Cox-Maze procedure
Intelligent toilet + electro potential sensor

Can monitor your heart beat.

Dangerous heart rhythms are detected

EMERGENCY
your doctor alerted

stroke avoided
The release of EPIC technology into the wider commercial environment has been talked about as being disruptive. The technology is certainly novel in its operation and opens up a wide range of fields.

Sensor detects changes in electric field through clothing and through walls for ECG monitor.

The EPIC series sensors are the first to measure changes in an electric field much as a magnetometer detects changes in a magnetic field, requiring no physical or resistive contact to take readings. Medical devices that are simply held close to a patient's chest, without wetting or shaving off hair, to obtain a detailed ECG.

**Driven Right Leg circuit**

This video is a practical demonstration of the automotive application for non-contact ECG measurements, through clothing in the difficult environment of a car.

**EPIC Technical Details**

The release of EPIC technology into the wider commercial environment has been talked about as being disruptive. The technology is certainly novel in its operation and opens up a wide range of fields.
Heart All A’flutter:
a ‘novel’ precipitant for tachyarrhythmia

Conclusion

In atrial tachyarrhythmias intractable to medical therapy, any underlying cause must be sought, and of course the best management is treatment of the underlying cause. One possible cause which clearly should be considered in future is erotic literature. A gradual weaning regime from The story of O, through Lady Chatterley’s Lover to the Twilight Saga might be a way of preventing future episodes. Finally, if effects of the novels can be extrapolated to the silver screen, then the launch of the film version of Fifty Shades of Grey may mean a big future payday for electrophysiologists.

A 52-year-old woman was admitted to the emergency department with palpitations, complaining of feeling lightheaded, giddy and flushed. She described several days’ history of these episodes, with increasing severity until she could barely breathe and felt as though she would collapse.

On examination she was breathless at rest, in a regular tachycardia at approx. 150bpm and relatively hypotensive, but with no other abnormal findings.

On a resting electrocardiogram (ECG), she was found to be in atrial flutter with 2:1 block. She was initially treated with metoprolol, rapidly converted to sinus rhythm and her symptoms completely resolved. Echo and all other investigations were unremarkable.

However, on cardiac monitoring her heart rate was noted periodically to spike, and repeat ECG showed recurrence of atrial flutter. The only clue was that she had resumed reading her book.

Following several similar admissions, a common thread was sought: Patients appeared to have normal thyroid function, no infectious trigger identified and no structural heart abnormality. Several, however, appeared to be clutching a similar grey tome to their chests.
Conclusions

• Make sure you’re on the right anticoagulation

• Make sure your AF rate is adequately controlled - <100 bpm is best

• Know your treatment options
Thank You

Any questions?