Management of
ATRIAL FIBRILLATION
in general practice

What is atrial fibrillation?

Atrial fibrillation (AF) is the most common cardiac arrhythmia encountered in primary care. It is often diagnosed as an incidental finding during a routine medical check. The prevalence of AF increases with increasing age, particularly from age 50 years. The overall prevalence of AF is approximately 1%, increasing to approximately 10% in people aged ≥ 80 years.[1, 2] The presence of cardiovascular disease further increases the risk of AF. An understanding of the current management issues and treatment options available to patients with AF is therefore essential for primary care clinicians.

AF is a cardiac arrhythmia characterised by rapid irregular contractions of the atria and an irregular ventricular response. The main consequences of AF are a potential reduction in cardiac output and the formation of thrombus within the atria. Patients with AF can have significant symptoms that affect quality of life. The risk of stroke for a person with AF is up to five times that of a person without AF.[3] This risk can be significantly reduced with antithrombotic treatment, in high risk patients.

In people diagnosed with AF, there are two separate but equally important issues that must be considered. These are:

- Symptom management
- Assessment and management of thromboembolic risk

The aims of treatment of AF are to provide relief of symptoms (if present), to prevent thromboembolic complications and to prevent other serious complications such as heart failure. In the majority of patients with AF the most appropriate and effective treatment is to control the rate. Antithrombotic treatment should be initiated in patients who are considered to be at high risk of thromboembolic complications.[4, 5]

Key concepts

- Atrial fibrillation (AF) is often an incidental finding during a routine medical check - symptoms may or may not be present and the diagnosis of AF should be confirmed with ECG
- Most people presenting with new onset AF will not be haemodynamically compromised, however, urgent referral to secondary care for possible cardioversion is required for patients with significant symptoms or complications
- Symptom management consists of rate or rhythm control – the choice of treatment is guided by the type of AF and other factors such as age, the presence of co-morbidities, the presence or absence of symptoms and patient preference
- All patients for whom a rhythm control strategy is contemplated should be referred to a cardiologist
- Antithrombotic treatment can be determined after an assessment of stroke and bleeding risk – choice is also dependent on whether the AF is valvular (warfarin or aspirin) or non-valvular (warfarin, dabigatran or aspirin)

A stepwise approach to management is recommended

1. Confirm the diagnosis with ECG
2. Consider if urgent referral to secondary care is required
3. Determine the type of AF (e.g. persistent, paroxysmal or permanent)
4. Symptom management
5. Assess stroke risk to determine if antithrombotic treatment is required

Confirm the diagnosis

A comprehensive history should be taken, although not all patients with AF will be symptomatic. Typical symptoms include; palpitations, tachycardia, tiredness, weakness, dizziness, mild shortness of breath and reduced exercise capacity. Patients may also present with more severe symptoms including; significant shortness of breath, chest pains and fainting.

Check when the symptoms started, how often they occur and how long they last. Assess the severity of the symptoms and the presence of any associated features that may suggest an underlying cause (such as hyperthyroidism). Ask about any precipitating triggers such as exercise, alcohol or stress.

Examination should include assessment of: pulse (rate and rhythm); blood pressure, jugular venous pressure; heart sounds, e.g. for murmur; lungs, e.g. for signs of infection, heart failure, chronic obstructive pulmonary disease (COPD): and peripheral oedema.

AF can be associated with conditions such as:[6]

- Hypertension
- Cardiovascular disease
- Cerebrovascular disease
- Diabetes
- COPD
- Hyperthyroidism
- Excessive alcohol consumption
- Infection

Approximately one-third of the estimated 35,000 people in New Zealand with AF will be asymptomatic.[7] Consider routinely checking and documenting the rate and rhythm of the radial pulse in older patients, particularly those with cardiovascular disease or in patients who have any of the conditions listed previously.

ECG

If AF is suspected on the basis of patient history or found incidentally during physical examination, the patient should have an electrocardiogram (ECG) to confirm the diagnosis. An initial ECG may also show evidence of other abnormalities that could suggest a possible underlying cause of the AF such as an old myocardial infarction (MI) or left ventricular hypertrophy. Other conduction abnormalities may be present such as pre-excitation (short PR interval) or bundle branch block. Assessment of the QT interval may be required prior to initiation of some anti-arrhythmic medicines such as amiodarone, sotalol and disopyramide.[5]

It is useful to check the patient's notes to see if they have a history of arrhythmia and to make a comparison with previous ECGs if available.

Blood tests

Blood tests are indicated to rule out any underlying condition that may have triggered AF. Consider:

- TSH to exclude hyperthyroidism
- CBC to exclude conditions such as anaemia or infection
- Electrolytes to exclude underlying metabolic abnormalities
- Creatinine/eGFR to check renal function
- Glucose to exclude diabetes
- LFT e.g. prior to anticoagulation or if high alcohol intake
- INR if warfarin is to be initiated

Echocardiography

All patients with newly diagnosed AF should ideally be referred for transthoracic echocardiography. This provides information that is helpful in assessing thromboembolic risk, particularly in relation to left ventricular function.

Other investigations

Depending on the clinical situation, patients with AF may require referral for other investigations including:

- Chest x-ray, e.g. in cases where shortness of breath is a significant feature as heart failure may co-exist or there may be other lung pathology
- Holter monitoring, e.g. in patients with paroxysmal symptoms and to assess effectiveness of rate control, especially in asymptomatic patients as poorly controlled AF, in the absence of symptoms, can be detrimental to cardiac function.

Consider if urgent referral to secondary care is required

The majority of people presenting with symptoms consistent with new onset AF will not be haemodynamically compromised, however, urgent referral to secondary care for possible cardioversion is required if the patient has:[6]

- A pulse rate > 150 beats per minute or a systolic blood pressure of < 90 mmHg
- Chest pain, increasing shortness of breath, severe dizziness or loss of consciousness (includes patients with acute ischaemic changes on ECG)
- Any complications of AF such as TIA, stroke, acute ischaemia or acute heart failure

In most acutely symptomatic patients, AF will be of new onset, however, in some patients it may be difficult to determine whether the AF is actually of new onset or rather is newly identified. An underlying condition can also trigger AF and reversion to sinus rhythm may result from appropriate treatment of the underlying condition.

Referral to or discussion with a cardiologist is recommended if the patient has:[6]

- Probable paroxysmal AF (as this requires medicines not usually initiated in primary care such as amiodarone or sotalol)
- ECG abnormalities such as Wolff-Parkinson-White syndrome or prolonged QT interval
- Known or suspected valvular disease
- Ongoing symptoms despite appropriate rate control treatment

Determine the type of AF

AF is generally classified into three types, although this may require further investigations and cardiologist input to determine. Knowing the type helps to guide treatment decisions regarding rate or rhythm control.

The three types of AF are:

- **Paroxysmal AF** – characterised by recurrent episodes of AF that last less than seven days (although often less than 24 hours) and resolve spontaneously within that time. Rhythm control is the preferred treatment.
- **Persistent AF** – characterised by episodes of AF that last more than seven days and that has not spontaneously resolved within this time. Treatment is rate or rhythm control depending on the individual patient situation.
- **Permanent AF** – AF that has been present for more than one year and cardioversion has failed or not been attempted. Rate control is preferred.

Symptom management

Rate or rhythm control?

The choice between rate or rhythm control is guided by the type of AF and other factors such as age, the presence of co-morbidities, the presence or absence of symptoms and patient preference. Clinical trials have not shown any significant differences between rate or rhythm control with respect to rates of stroke and mortality. Improvements in quality of life are seen with both treatment approaches.[5]

Rate control is recommended for the majority of patients.[4, 7] It should be considered in particular for patients with:

- Asymptomatic AF
- Permanent AF

Any concerns about a strategy of rate control for a particular patient can be discussed with a cardiologist.

Rhythm control, which aims to restore and maintain sinus rhythm, should be considered for patients with:[4, 7]

- Paroxysmal AF
- Persistent AF and ongoing symptoms, any haemodynamic compromise, failure of rate control or persistent symptoms despite rate control
- Structural heart disease, e.g. severe left ventricular dysfunction or hypertrophic cardiomyopathy (AF is usually not well tolerated in these patients)

All patients for whom a rhythm control strategy is contemplated should be referred to a cardiologist.

Rate control medicines

The ventricular rate may be controlled using beta blockers, rate limiting calcium channel blockers (verapamil or diltiazem) or digoxin. The choice of a medicine for rate control in patients in primary care should be guided by the presence of co-morbidities and also by the level of activity of the patient. Table 1 lists first to fourth-line options for rate control. Medicines may be used singularly or in combination.

As a guide, target heart rate should be ≤ 80 beats per minute at rest and ≤ 115 beats per minute with moderate walking. A patient who is active is unlikely to achieve rate control with digoxin alone. Patients who achieve poor rate control on maximally tolerated first, second or third-line medicines used in combination, particularly with ongoing symptoms, should be referred to a cardiologist for consideration of additional treatment options. This may include amiodarone, AF ablation or AV node ablation with pacemaker implantation. Consultation with a cardiologist

Table 1: Rate control medicines used in atrial fibrillation[7]

<table>
<tr><th>Co-morbidity</th><th>First line</th><th>Second line</th><th>Third line</th><th>Fourth line</th></tr>
<tr><td>No heart disease</td><td rowspan="3">Beta-blockers* (not sotalol)</td><td rowspan="3">Calcium channel blockers**</td><td rowspan="3">Digoxin</td><td rowspan="4">Amiodarone
Ablation and pacing may be considered</td></tr>
<tr><td>Hypertension</td></tr>
<tr><td>Ischaemic heart disease</td></tr>
<tr><td>Congestive heart failure</td><td>Metoprolol or carvedilol</td><td>Digoxin</td><td>Diltiazem</td></tr>
<tr><td>COPD</td><td>Calcium channel blockers**</td><td>Beta- blockers* (provided no significant reversible bronchospasm)</td><td>Digoxin</td></tr>
</table>

*Beta-blockers including atenolol, carvedilol, metoprolol, nadolol and propranolol but not sotalol

**Rate limiting calcium channel blockers, i.e. diltiazem or verapamil only. Avoid using verapamil with beta-blockers

is also recommended if there is any uncertainty over which combinations of medicines to use.

Rhythm Control

All patients, for whom rhythm control is considered to be the most appropriate treatment option, should be referred to a cardiologist. Sinus rhythm can be restored using electrical or pharmacological cardioversion, e.g. with flecanide or amiodarone. AF may recur after electrical or pharmacological cardioversion therefore ongoing rhythm control with antiarrhythmic medicines will usually be required. A brief overview of some of the available options follows – for more detailed information refer to the European Society of Cardiology Guideline.[5]

Medicines that are commonly used to achieve or maintain rhythm control after restoration of sinus rhythm include:

- Beta blockers, e.g. metoprolol, atenolol
- Sotolol, a beta blocker with additional class III antiarrythmic activity
- Flecanide, a class I antiarrythmic agent
- Amiodarone, a class III antiarrythmic

These antiarrythmic medicines (excluding beta blockers such as metoprolol and atenolol) carry a small (1%) but important risk of proarrhythmia (aggravation of existing or increased risk of new arrhythmia) and should not be prescribed without consultation with a cardiologist.[5, 8]

Treatment must be individualised with the risks and benefits fully explained to patients.

Radiofrequency ablation of AF is a new treatment option and may be considered in patients with significant limiting symptoms despite medical treatment or patients who wish to consider this treatment for lifestyle reasons.

Choosing rate or rhythm control

The following examples illustrate treatment choice between rate or rhythm control:

1. In a stable, older patient with few symptoms and a recent but unclear onset of AF, control of rate is the treatment of choice. Target heart rate should be ≤ 80 beats per minute at rest and ≤ 115 beats per minute with moderate walking.[7] Rate control medicines can be initiated in primary care.
2. In a younger patient with recurrent episodes of very symptomatic AF and a clear onset of symptoms, the preference is for rhythm control. Although spontaneous conversion to sinus rhythm may occur (up to 50% revert back within the first 24 hours),[8] the patient is likely to benefit from pharmacological or electrical cardioversion, ideally within 48 hours of the onset of symptoms. If cardioversion cannot be performed within 48 hours, the patient must be anticoagulated to facilitate this at a later date. Medicines such as metoprolol can be used to control the rate and relieve symptoms. Referral to secondary care is required for cardioversion whether pharmacological or electrical and also for advice about ongoing rhythm control.

Assess thromboembolic risk and stroke risk to determine appropriate antithrombotic treatment

AF is associated with a pro-thrombotic state and an approximately five-fold increase in stroke risk.[3] The presence or absence of a number of variables influences this risk (Table 2). The risk of stroke is the same regardless of whether the patient has paroxysmal or sustained (permanent or persistent) AF.

Bleeding risk should be estimated to help assess the risk-benefit ratio prior to choosing appropriate antithrombotic treatment.[9] Validated assessment tools such as $CHADS_2$, CHA_2DS_2-VASc and HAS-BLED are widely used to help guide treatment (Page 14).

If the $CHADS_2$ score is ≥ 2, the patient should be anticoagulated. If a patient has a $CHADS_2$ score of less than 2, consider using CHA_2DS_2-VASc to further evaluate risk and to guide treatment choice. Aspirin may be considered for patients with AF who are unsuitable for anticoagulation. Also consider co-morbidities, monitoring requirements and patient preference when determining whether anticoagulation is suitable.

Once the decision to anticoagulate has been made, the next decision is whether to use warfarin or dabigatran. All patients with haemodynamically significant valvular disease or a prosthetic valve should be anticoagulated with warfarin.

For further information about using dabigatran see "The use of dabigatran in general practice", BPJ 38 (Sept, 2011)

For further information about antithrombotic treatment in AF, see "Consensus statement" Page 10.

Further reading

There are a number of guidelines available for the management of AF. The 2005 New Zealand guideline and the 2006 United Kingdom NICE guidelines are scheduled for review.[4, 7] The European Society of Cardiology Society Guidelines have recently been updated and are recommended reading.[5] With the recent introduction of dabigatran, further updates are expected.

Table 2: Risk factors for stroke and thromboembolism in non-valvular AF[5]

Major risk factors	Clinically relevant non-major risk factors
Previous stroke	Congestive heart failure or moderate to severe LV systolic dysfunction (e.g. LV ejection fraction ≤ 40%
TIA or systemic embolism	Hypertension, diabetes or vascular disease
Age ≥ 75 years	Age 65–74 years
	Female gender

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