

Atrial Fibrillation (AF) or Flutter – Recent Onset

Requiring admission, or onset during admission for other problem e.g. post-surgery.

- Haemodynamic compromise is an indication for rapid DC cardioversion - always use sedation or general anaesthesia.
- If the patient is haemodynamically stable (no reduced conscious level, systolic BP >90mmHg, no chest pain and no heart failure) and onset <48 hours, consider chemical cardioversion.

Chemical cardioversion

Options include:

Amiodarone IV 300mg infused over 1 hour then 900mg over 24 hours through a central line (preferable) or large peripheral line or

Flecainide IV 2mg/kg, up to 150mg, over 30 minutes if no structural or coronary heart disease.

- Control ventricular rate with oral beta-blocker or rate-limiting calcium channel blocker (or digoxin if heart failure is present).
- Remember – many cases of new onset AF or flutter will spontaneously revert to sinus rhythm – particularly if there is an obvious precipitating cause such as pneumonia, alcohol intoxication, hyperthyroidism or surgery.
- Cardioversion is much less successful in established AF or flutter than in new onset, and, if being considered, should not be delayed. Anticoagulant cover required if onset >48 hours, so 4 – 6 week delay required.

Maintenance of Sinus Rhythm

Options include beta-blocker, sotalol, flecainide and amiodarone depending upon circumstances and patient factors.

Amiodarone loading regime is **amiodarone oral 200mg three times daily for 1 week then 200mg twice daily for 1 week then 200mg daily.**

N.B. Ideally, check baseline thyroid and liver function tests before starting.

Interactions include digoxin and simvastatin (see BNF Appendix 1 for more details).

N.B. Deal with precipitants of AF: Infection, alcohol, hyperthyroidism, heart failure

Atrial Fibrillation (AF) – Persistent

Objectives

Therapeutic:

1. Relieve symptoms – often only rate control required; diuretic may also be needed (often only on temporary basis).

2. Target ventricular (apex or ECG) rate <110bpm. If still symptomatic, aim for lower rate, <80bpm.
3. Assess thromboembolic risk and anticoagulate as appropriate (see flow chart further on).
4. In some cases, consider restoration of sinus rhythm by electrical or pharmacological cardioversion (only attempt chemical or electrical cardioversion after adequate anticoagulation with warfarin; risk of thromboembolism if not anticoagulated; limited long-term success).
5. Treat concomitant LV systolic dysfunction / heart failure.

Ventricular rate control

1. Target ventricular (apex or ECG) rate <110bpm. If still symptomatic then aim for lower rate, <80bpm.
2. Patients without heart failure should be started on either:
 - A beta-blocker – choice includes:
 - **Bisoprolol oral 2.5mg daily and up-titrate to 5mg once daily** if ventricular rate is still >110bpm or
 - **Atenolol oral 25mg twice daily and up-titrate to 50mg twice daily** if ventricular rate is still >110bpm. In frail or elderly patients consider starting dose of **atenolol oral 25mg once daily**.

Or

- A rate-limiting calcium-channel blocker (CCB) i.e. verapamil or diltiazem (but avoid if LV systolic dysfunction)- **Start with verapamil (slow release) oral 120mg once daily and titrate up to 240mg once daily if ventricular rate still >110bpm.**

N.B. Beta-blockers and rate-limiting CCBs must not be combined except under specialist supervision.

Digoxin has a limited role as first-line treatment for ventricular rate control. It can be used in combination with a beta-blocker / rate-limiting CCB when control of the ventricular rate is difficult.

3. Patients **with** heart failure should be started on digoxin and follow the NHSGGC Heart Failure guideline.

Heart failure / LV Systolic Dysfunction

. ACE inhibitors and beta-blockers are strongly recommended. Beta-blockers must be initiated under direction of a hospital physician. Rate-limiting CCBs should be avoided.

Prevention of stroke / thromboembolism

- Patients with both recurrent paroxysmal AF and sustained AF have a high risk of thromboembolism, particularly stroke. Compared to subjects without AF the absolute risk of stroke is, on average, increased by about 4-fold and the risk of stroke is about 4% per annum.
- This risk is greatest in patients with certain risk factors (see flow diagram below).
- For primary prevention, anticoagulants can substantially reduce risk of thromboembolism.
- Patients with AF and a previous stroke or transient ischaemic attack (TIA) have an absolute risk of a further stroke of the order of 10–12% per annum and an absolute benefit of approximately 80 fewer strokes per 1000 patient years of treatment.
- Advanced age is not a contraindication to anticoagulation.
- In patients with 'lone' AF, i.e. AF in a structurally normal heart and no other risk factors for thromboembolic disease (CHA₂DS₂-VASC = 0), no anti-thrombotic or anticoagulant therapy is recommended.

Who should receive anticoagulant therapy

- Patients with clinical risk factors or echocardiographic risk factors (see flow diagram below).
- Patients without contraindications to anticoagulant therapy.

Cautions / contraindications to anticoagulant therapy

- Absolute contraindications include: active bleeding, pregnancy, stroke <14 days.
- Relative contraindications include: significant bleeding risk e.g. active peptic ulcer or recent head injury; bleeding in the last 6 months; previous cerebral haemorrhage.
- Cautions include: recurrent falls, alcohol abuse.

Choice of agent: new oral anticoagulant agents (NOACs) vs warfarin

Pros of NOACs

- More stable anticoagulation
- No requirement for anticoagulant monitoring
- Fewer food and drug interactions
- Fewer intracranial bleeds

Cons of NOACs

- No specific antidote
- More gastrointestinal bleeding with dabigatran and rivaroxaban, especially in the elderly

Remember: NOACS are indicated only in those patients who have non-valvular AF; not those with mitral stenosis or a mechanical valve.

Combined anticoagulant and antiplatelet therapy

Adding aspirin to warfarin in AF does not reduce the risk of stroke (except with prosthetic heart valves) but substantially increases the risk of bleeding. The combination is generally not indicated in stable coronary disease, but there are some circumstances, such as after an acute coronary event or PCI, when short-term combined double or triple therapy is used according to cardiologist advice.

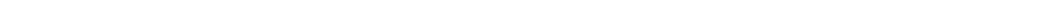
CHADS₂ -> CHA₂DS₂VASc

CHADS2 Risk	Score	CHA2DS2-VASc Risk	Score
CHF	1	CHF or LVEF ≤ 40%	1
Hypertension	1	Hypertension	1
Age > 75	1	Age ≥ 75	2
Diabetes	1	Diabetes	1
Stroke or TIA	2	Stroke/TIA/Thromboembolism	2
		Vascular Disease	1
		Age 65 - 74	1
		Female	1

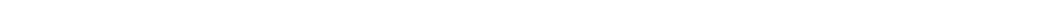
From ESC AF Guidelines
<http://escardio.org/guidelines-surveys/esc-guidelines/GuidelinesDocuments/guidelines-afib-FT.pdf>

Table 1 – CHADS₂ scoring table

Non-valvular Atrial fibrillation (paroxysmal, persistent or permanent)



Determine risk of thromboembolism (use CHADS₂, table 1 above)



If CHADS₂ = 0 or 1 – Use CHA₂DS₂-VASC scoring table [here](#)

If CHADS₂ ≥2 – continue below



Warfarin or direct thrombin inhibitor or factor Xa inhibitor (NOAC)

(if no contraindications, outlined above)

Figure 1 – Prevention of stroke / thromboembolism in AF stroke algorithm

New anticoagulants (direct thrombin and Factor Xa inhibitors)

- New anticoagulants:

- **Apixaban oral 5mg twice daily**
- **Dabigatran oral 150mg twice daily**
- **Rivaroxaban oral 20mg once daily**

Doses may need to be reduced in some patients who have either low body weight (≤ 60 kg), renal impairment or age ≥ 80 years and another risk factor. For details see NOAC Prescribing in Patients with Non-Valvular AF

Digoxin

In frail elderly patient or patients with very low body weight, lower loading and maintenance doses than those advised below may be required.

Loading dose – normal renal function:

- **Digoxin oral** (preferred route) **500micrograms followed 6 hours later by 500–1000micrograms in divided doses > 6 hours apart or**
- **Digoxin IV 500micrograms followed 6 hours later by 250–500micrograms in divided doses 4–6 hours apart.**

Loading dose – renal impairment (creatinine clearance <30ml/minute):

- **Digoxin oral** (preferred route) **500micrograms followed 6 hours later by 250–375micrograms in divided doses >6 hours apart or**
- **Digoxin IV 250–500micrograms**

N.B. Digoxin injection: 25micrograms = 0.1ml. Additional loading doses may be required; give according to ventricular (heart rate) response.

Maintenance daily dose: The tables below outline digoxin daily maintenance dosing for patients <60kg (see table 2) and >60kg (see table 3).

Drugs to be reviewed in bnf:

1. Bisoprolol
2. Furosemide
3. Amiodarone