

General

SVT with chaotic atrial activity from multiple re-entrant circuits.

The 3 primary ways AF affects haemodynamic function include the following:

- Loss of atrial kick (synchronized atrial mechanical activity)
- Irregularity of ventricular response
- Inappropriately rapid heart rate

These can lead to haemodynamic impairment (myocardial ischemia or CCF) and/or local embolic atrial thrombus (which may embolise).

AF occurs in 3 distinct clinical circumstances:

- As a 1° arrhythmia w/o structural heart disease
- As a 2° arrhythmia w/o structural heart disease but with a predisposing cond.
- As a 2° arrhythmia associated with cardiac disease that affects the atria

1-2% of the total population, higher in the elderly (10% if >85y), M>F.

AF may increase mortality up to 2-fold, primarily due to embolic stroke (25% of CVAs in >80y).

Risk of embolism associated with cardioversion is stated to be as high as 2%.

Classification

Acute AF - New onset

Recurrent (Chronic) AF - a patient over time may experience one or more of the subtypes:

- Paroxysmal - Duration \leq 7days (often spontaneous termination within 48hrs)
- Persistent - Duration >7 days
 - Permanent - Duration >7 days (usually >1yr), resistant to cardioversion if tried

Lone AF = AF in individuals w/o structural/cardiac/pulm. disease, with low risk for thrombus.

Risk Factors:

Age, male, risk factors of IHD or valvular HD

Causes

- Cardiovascular
 - HT, IHD, HF, cardiomyopathy, valve dis., sick sinus, ASD, carditis, pre-excitation
- Non-cardiovascular
 - Metabolic: Low levels of potassium, magnesium, or calcium
 - Sepsis
 - Endo: Hyperthyroidism, phaeochromocytoma,
 - Drugs: Sympathomimetics, acute EtOH intoxication
 - Respiratory: PE, pneumonia, lung cancer, COAD
 - Env: Hypothermia, electrocution
 - Idiopathic (Lone AF)

Presentation

Asymptomatic (20%), irreg. irreg. pulse, palpitations, symptomatic CCF, absent 'a'-waves.

Differential Diagnosis

Atrial flutter, MAT, atrial ectopics, SVTs, WPW, VT.

Investigations

Bloods: FBC, UEC, CMP, TFT, Trp/CK, INR

Imaging: CXR, Echo (?valve disease, LV size & fn, LA size & thrombus - TOE better than TTE)

ECG: R-R variability, loss of normal P waves. Holter monitor if Dx in question.

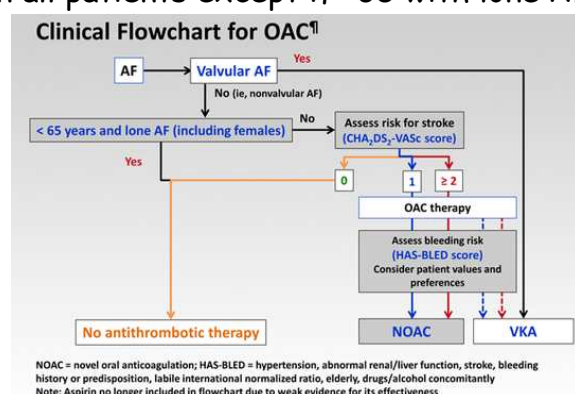
Management

Aims: Treat any underlying cause, Rate vs Rhythm control, Prevention of thromboembolism

- ABCs + O₂, IVC, Bloods (as above)
- If ↓↓BP, ↓GCS, cardiogenic shock, preexcitation, or unstable angina/MI → DC shock.
- Magnesium sulphate 2.5g (10mmol) over 20min may assist rate/rhythm control
- Rate control to <90bpm @ rest if >65, IHD, antiarrhythmic CI, cardioversion unsuitable[‡]
 - ([‡]anticoagulation CI; structural heart dis.; AF>12mo; multiple failed cardioversion/relapses; ongoing but reversible cause of AF)
 - No pre-excitation or CCF:
 - **Metoprolol** (esp thyrotoxic, ↑symp tone or IHD) or **verapamil** (if CAL. **NB Don't give with BB**) 1mg incr IV max 10-15mg or **amiodarone** as below
 - No pre-excitation but some CCF, or elderly & sedentary (digoxin may be ineffective if sig sympathetic stimulation):
 - **Digoxin** 500mcg IV/PO load then 250mcg q6hr x 3 then 62.5-250mcg po od
 - **Amiodarone** 5mg/kg IV then 15mg/kg IV over 24hrs all in 5% dextrose
 - Pre-excitation:
 - **Procainamide** (N/A Aus), **flecainide** 1.5mg/kg IV (normal heart, no known IHD or LVF and age≤55) or **amiodarone** (if CCF, though small risk of VT)
 - Rhythm control → SR if symptomatic, <65, lone AF, CCF, 2° to corrected underlying cause
 - DC: if unstable, failed drug Rx or new onset/lone AF (after 24-48hrs)
 - Sedation. Biphasic 100-200J, AP paddles → >90% success, but 50% relapse
 - Pre-procedural anticoagulation:
 - AF < 48hrs (& no structural dis. or prior embolism): None
 - AF ≥ 48hrs & no LA thrombus on TOE and no structural disease on TTE: give 24hrs heparin first
 - Else: 3-4wks of anticoagulation
 - If AF ≥ 48hr give post-cardioversion anticoagulation for 4wks (duration debated) due to atrial stunning. Continue depending on thromboembolic risk
 - Pharmacologic cardioversion
 - **Flecainide** 2mg/kg IV or 200-300mg PO, can repeat (**CI:** structural heart disease, IHD, LVF or age > 55) - successful < 8hrs in 80%. (**SE:** ↑HR)
 - Else **amiodarone** 5mg/kg IV 30min load then 10-15mg/kg over 24hrs.
 - Or newer **dofetilide** 125-500mcg bd PO or **ibutilide** 1mg IV over 10min (**SE:** torsade 5%) - 90% success
 - **Sotalol** 80-160mg IV/PO, low success rate (**CI:** unstable, LVF)
 - Maintenance of SR - **amiodarone**, **sotalol**, **flecainide**
 - Antithrombotic treatment considered in all patients except if <65 with lone AF

CHADS ₂ Risk Score ^[a]		CHA ₂ DS ₂ -VASc Risk Score ^[b]	
	Points		Points
Congestive heart failure	1	Congestive heart failure or LVEF ≤ 35%	1
Hypertension	1	Hypertension	1
Age ≥ 75 years	1	Age ≥ 75 years	2
Diabetes	1	Diabetes	1
Stroke/TIA	2	Stroke/TIA/systemic embolism	2
		Vascular disease (MI/PAD/aortic plaque)	1
		Age 65-74 years	1
		Sex category (female)	1
		Truly low risk Score = 0	

LVEF = left ventricular ejection fraction



- NOAC: **Dabigatran** (thrombin inhibitor) or **rivaroxaban** (oral Xa inhibitor) preferred unless
- Valvular AF: **Warfarin**, give **heparin** (e.g. **enoxaparin** 1mg/kg SC bd) cover until INR 2-3
- Other: Overdrive pacing, RFq ablation+pacemaker, LA appendage occlusion, or surgery