

EVIDENCE SUMMARY 2013

Management of atrial fibrillation with rapid ventricular response (afrvr) in emergency departments

1. INTRODUCTION

This evidence update assumes that the identification of the cardiac rhythm as atrial fibrillation with rapid ventricular response (AFRVR) has been confirmed (see below).

Identification of atrial fibrillation

Atrial fibrillation (AF) is identified by a sustained irregularly irregular heart beat and the absence of p waves on the ECG. In most instances the QRS complex will be narrow but as the ventricular response increases the QRS complex may widen due to aberrant conduction. The QRS complexes will also be wide if there is a pre-existent bundle branch block.

Sustained AF with widened QRS complexes can be distinguished from ventricular tachycardia (VT) by its persistent irregularly, irregular pattern. Although non-sustained VT may be irregular it is distinguished from AF by the fact that it reverts to normal rhythm after a short duration (usually < 20 beats) although it may recur within a few beats. For example Torsade de Pointes, a particularly malignant form of irregular non-sustained VT, either reverts to normal rhythm spontaneously or degenerates into ventricular fibrillation. Typically Torsade de Pointes occurs as multiple non-sustained episodes.

Sustained AF with widened QRS complexes is distinguished from sustained VT by the fact that unlike AF sustained VT is typically regular.

Sustained AF with widened QRS complexes and a ventricular response of > 200 beats/min should arouse suspicion of a WPW syndrome. Optimal treatment of such patients is early electrical cardioversion if haemodynamically compromised. Amiodarone infusion could be considered in haemodynamically stable patients.

2. MANAGEMENT

Initial management depends on the clinical condition of the patient and the duration of the arrhythmia.

In all cases, a search should be made for an underlying/ precipitating cause.

Haemodynamically unstable patients.

It is quite rare for a patient to present with isolated AFRVR and be haemodynamically unstable. Look for a serious underlying illness, myocardial infarction or pre-existent structural heart disease and exclude sustained VT (rate will be regular). Even if there is uncertainty regarding the precise electrical diagnosis the optimal treatment of any broad complex tachycardia with a heart rate greater than 200/min and haemodynamic instability is electrical cardioversion irrespective of whether the arrhythmia is sustained AF with aberrant conduction, sustained VT or sustained AF with WPW syndrome

- **If the patient's condition is life-threatening,** attempt immediate synchronised cardioversion (with sedation as required).

If this is unsuccessful, administer amiodarone 5mg/kg over 10-20 mins and repeat attempted cardioversion. An amiodarone infusion at 900mg/ 24 hours should be commenced.

- **In patients that are unstable but non-life threatening** (e.g. ongoing chest pain, significant APO):
 - For those with recent onset AFRVR (<48 hours duration), electrical cardioversion should be attempted. If there is a delay to this, IV amiodarone should be used. Risks of sedation and local skills and resources will guide decision-making.
 - For those in permanent AF, an urgent rate control strategy should be implemented using:
 - IV beta blocker or rate limiting calcium channel blocker
 - IV amiodarone if the above are contra-indicated, ineffective or the patient has AF and heart failure.

Stable patients (haemodynamically stable, no chest pain or APO).

There are a number of treatment options:

- ❖ Rate control
- ❖ Rhythm control using drugs that can chemically encourage cardioversion
- ❖ Rhythm control with electrical cardioversion (same admission or delayed)

Irrespective of which treatment option is chosen consideration will need to be given to anti-thrombotic therapy to reduce the likelihood of thrombo-embolism.

There is no evidence that rhythm control leads to better outcomes than rate control.

The choice will depend on local practices and resources and patient preference.

If a patient has been in AFRVR for more than 48 hours, duration is unclear or there are high risk features (mechanical valve, rheumatic heart disease or recent TIA or stroke), cardioversion (chemical or electrical) **should not** be attempted due to risk of embolization of atrial clot. The exceptions are a patient who has been fully anticoagulated for at least 3 weeks with a therapeutic INR level or if the absence of clot has been shown by trans-oesophageal echocardiography.

Cardioversion (chemical or electrical) may be considered in patients with duration of AF<48 hours who do not have high risk features (mechanical valve, rheumatic heart disease, recent TIA/ stroke).

❖ Rate control:

Either an oral or an intravenous strategy may be adopted.

a. Intravenous either:

- Intravenous beta-blocker (eg metoprolol 2.5-5mg IV over 2 mins; repeated to max dose 15mg) or
- Non-dihydropyridine calcium channel blocker (eg verapamil 0.075-0.15mg/kg over 2 mins). Avoid in heart failure.

CAUTION: Do not use both.

Caution in patients with hypotension or heart failure.

Intravenous amiodarone 5mg/kg is recommended for patients with AFRVR and heart failure.

b. Oral

- Metoprolol 25-50mg tds or
- Verapamil 40-80mg tds

For patients being discharged on a rate control strategy:

- Target heart rate prior to discharge is <110 bpm. Script for ongoing oral therapy is required.
- Stroke prophylaxis is required (see below).

Digoxin is not recommended because of slow onset of action and its impact is limited to resting heart rate.

❖ Rhythm control using drugs that can chemically encourage cardioversion (Pharmacological)

For patients without structural heart disease (confirmed by history, examination and preferably echocardiography), flecainide is preferred. Either 200-300mg orally or 2mg/kg IV over 10 mins. Flecainide should be avoided in patients aged >65 years unless left ventricular function is known to be normal.

For patients with structural heart disease or age >65, amiodarone is preferred. Dosage as above.

❖ Rhythm control with electrical cardioversion (same admission or delayed)

A 150-200J synchronised biphasic shock is recommended.

If chemical or electrical reversion is unsuccessful, rate control will be required.

If reversion is successful consider continued anti-arrhythmic therapy e.g. flecainide (100mg b.d.), sotalol (40-80mg b.d.), or amiodarone (200mg b.d. for 2 weeks then 200mg daily) until review.

Anti-thrombotic therapy

1. Oral anticoagulation (e.g. with warfarin) should be considered in patients with persistent or paroxysmal AF, guided by the CHADS 2 score and for patients in whom a deferred rhythm control strategy is chosen (e.g. later electrical cardioversion).

CHADS 2 score

Prior stroke or TIA	2 points
Age >75	1 point
Hypertension	1 point
Diabetes	1 point
Congestive heart failure	1 point

Score ≥ 2 : oral anticoagulation strongly recommended e.g. with warfarin. Target INR 2-3

Score 1: oral anticoagulation preferred

Score 0: aspirin

2. Oral anticoagulation (e.g. with warfarin) should be used in patients in whom a delayed rhythm control strategy is planned (3 weeks before and 4 weeks after delayed cardioversion).

3. Patients with an isolated episode of AF of duration of <48 hours, who have return to stable sinus rhythm within the same 48 hour window do not usually require anti-coagulation, unless they have high risk features such as mechanical valve, rheumatic heart disease or recurrent episodes.

3. FOLLOW-UP

All patients require followup with an appropriate clinician to further evaluate the cause and ongoing treatment requirements.

REFERENCES

1. Australian Resuscitation Council Guideline 11.7 management of arrhythmias 2009.
2. Royal College of Physicians (UK) Atrial Fibrillation: National clinical guideline for management in primary and secondary care.
3. Stiell IG, Macle L, CCS atrial fibrillation guidelines committee. Canadian cardiovascular society atrial fibrillation guidelines 2010: management of recent onset atrial fibrillation and flutter in the emergency department. Can J Cardiol 2011; 27:38-46.
4. The Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology. Guidelines for the management of atrial fibrillation. European Heart Journal 2010; 31:2369-2429.

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An expert reference group was established to develop the recommended treatment pathway and evidence summary. The group included emergency clinicians and cardiologists: Prof Anne-Maree Kelly (chair), Prof Rick Harper, Prof Andrew Maclsaac, A/ Prof Kean Soon, Dr Howard Connor, Dr Michael Yeoh and Dr Tony Kambourakis.