
Clinical Guideline

Guidelines for the management of new onset atrial fibrillation following cardiac surgery

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GUIDELINES FOR THE MANAGEMENT OF NEW ONSET ATRIAL FIBRILLATION FOLLOWING CARDIAC SURGERY

Introduction

- Post Operative Atrial Fibrillation (POAF) is defined as new-onset Atrial Fibrillation (AF) occurring after surgery but prior to hospital discharge. This common complication of cardiac surgery occurs in up to 30% of patients following Coronary artery bypass grafting and up to 50% of patients following valve surgery. It carries a significant risk of stroke, heart failure, thromboembolism, bleeding (from anticoagulation) and prolonged inpatient stay.
- Due to the high incidence of this complication, management starts with preventive measures.

PROPHYLAXIS

Pre-operative measures:

- Continue anti-arrhythmic medication (beta blockers, amiodarone, digoxin) up to and including the morning of the operation

Post-operative measures:

- Resume any pre-operative anti-arrhythmic medications :
 - Beta Blockers: Start on post-operative day 1 (POD 1) or once patient is off any inotropic and vasopressor support with stable clinical condition for 6 hours. Start at the lowest dose and increase as tolerated.
 - Digoxin: Resume on POD 1 with the same pre-operative dose. Consider lowering dose if impaired renal function.
 - Amiodarone: Resume on POD 1 with the same pre-operative dose.
- If the patient was not receiving a beta blocker before operation, start bisoprolol 1.25mg daily, unless contraindicated (e.g. asthma), and titrate as tolerated.

- **Electrolytes :**
 - **Potassium:**
 - Check regularly (every 4 hours or as indicated)
 - Supplement to keep level $\geq 4.5\text{mmol/L}$
 - Intravenous (IV) supplementation is recommended if the central line is in place, otherwise oral supplementation is acceptable
 - Consider patient urine output and renal function
 - **Magnesium:**
 - Check once daily until day 4 post operative then as required.
 - Supplement to keep level above 1mmol/L
 - Give IV supplementation either via central or peripheral route, otherwise oral supplementation

TREATMENT

The primary goal of treatment is to restore sinus rhythm. If that is not possible, then rate control to a tolerable acceptable level becomes the target.

A. Rhythm control :

1. Amiodarone:

- Agent of choice for rhythm control
- Does not cause haemodynamic instability so can be used in heart failure and patients on inotropes or vasopressors
- If amiodarone is contra-indicated for any reason (hypersensitivity/ poor lung function) shift to rate control strategy.
- Amiodarone interacts with digoxin, enhancing its effect. Reduce dose of digoxin by 50% when administered concomitantly (e.g. if taking digoxin 125micrograms once daily reduce dose to 62.5micrograms once daily)

- Loading :
 1. Central IV :
 - a. For use if
 - i. Patient is in critical care / high dependency unit
 - ii. hemodynamic compromise
 - b. 300mg over 1 hour then 900mg over 23 hours
 2. Oral :
 - a. For use if
 - i. Patient on the ward
 - ii. No iv access
 - b. 400mg TDS for 24 hours
- If rate is not controlled within 6 hours of starting amiodarone loading, add a beta blocker (if not yet started) or increase beta blocker dose as tolerated. (review rate control section)
- If heart rate drops to less than 60bpm, stop loading and shift to maintenance once HR \geq 60bpm.
- Maintenance:
 - Start if AF continues for more than 24 hours.
 - Oral 200mg TDS for 1 week then 200mg BD for 1 week then 200mg OD until the 6th week follow up visit.
- Send baseline thyroid and liver function tests.

2. Direct Current Cardioversion:

- Consider if
 1. Haemodynamic instability
 2. Inability to control heart rate
 3. Patient remains in AF for more than 48h, provided patient is well anticoagulated
- Should be done after TOE exclusion of LA thrombus

B. Rate control:

- Add to amiodarone if patient is still in rapid AF 6hours following the start of amiodarone loading
- Use as first line treatment if amiodarone is contraindicated

1. Beta Blockers:

- First line for rate control treatment,
- Do not use if patient is on any inotropic support
- Use either:
 - I. Bisoprolol: 2.5 mg up to 10mg daily titrate according to HR and BP
 - II. Metoprolol 25mg up to 100mg TDS

2. Digoxin:

- Can be used if other drugs are not tolerated or contra-indicated
- Can be added to amiodarone and/or beta blockers for better rate control. Please note interaction with amiodarone above.
- Dose :
 - I. Loading 500 to 1000 microgram iv or oral (depending on age and lean body weight) in divided doses over 24 hours. Start cautiously in patients taking amiodarone or patients with renal impairment.
 - II. Maintenance (if patient still in AF) 125 to 250 micrograms OD. Reduce to 62.5micrograms if patient is on amiodarone or has impaired renal function
- Measure digoxin level after 5 days.
- Adjust maintenance dose according to renal function and digoxin level
- Avoid hypokalaemia which can predispose to digoxin toxicity

C. Anticoagulation:

- Start therapeutic low-molecular weight heparin (LMWH) or unfractionated heparin (UFH) if POAF persists for more than 24 hours or paroxysmal

- Dalteparin once daily - dosed according to weight and renal function if creatinine clearance ≥ 30 ml/min ([please see Trust guidelines/SPC for dalteparin](#) for advice on dosing).
- UFH intravenous infusion in those with creatinine clearance < 30 ml/min &/or post mechanical valve surgery: [follow GSTT heparin infusion guidelines for dosing advice and target APTT](#)
- IF POAF persists for more than 48hours or more than 24hours in a patient with high risk for thrombo-embolism ($CHA_2DS_2VaSc > 1$) start oral anticoagulants.
- Rivaroxaban is the first choice of anticoagulant unless patient is on renal replacement therapy or has had mechanical valve surgery.

- **Rivaroxaban**

- Give 24 hours after stopping LMWH and once there is a low risk of bleeding (drains and pacing wires out, no possible indication of further intervention such as pleural, pericardial drainage or pace maker insertion).
- 20mg once daily if creatinine clearance ≥ 50 ml/minute, reduce dose to 15mg once daily if creatinine clearance is 15-49ml/minute. If creatinine clearance is less than 15ml/minute warfarin is recommended.
- For prescribing advice, follow-up and further information please refer to the trust [guidance on the use of rivaroxaban for stroke prevention in atrial fibrillation \(AF\)](#).

- **Warfarin**

- To be used after mechanical valve surgery and or patients on renal replacement therapy.
- Continue unfractionated heparin till INR therapeutic on two consecutive occasions
- Refer to their local anticoagulation clinic for follow up after discharge

- [Refer to GSTT warfarin guidelines for dosing advice.](#)
- Once started, regardless of the rhythm, continue oral anticoagulants till the 6week follow up visit – ensure sufficient supply arrangements of anticoagulant made until this appointment.
- At 6week follow up visit, stop oral anticoagulant if patient is back to normal sinus rhythm and no other indication
- For post CABG patients, omit clopidogrel and keep patient on oral anticoagulant + aspirin

In case of bleeding while patient on rivaroxaban, please refer to trust guidelines on gti (Reversing new oral anticoagulant-associated bleeding)

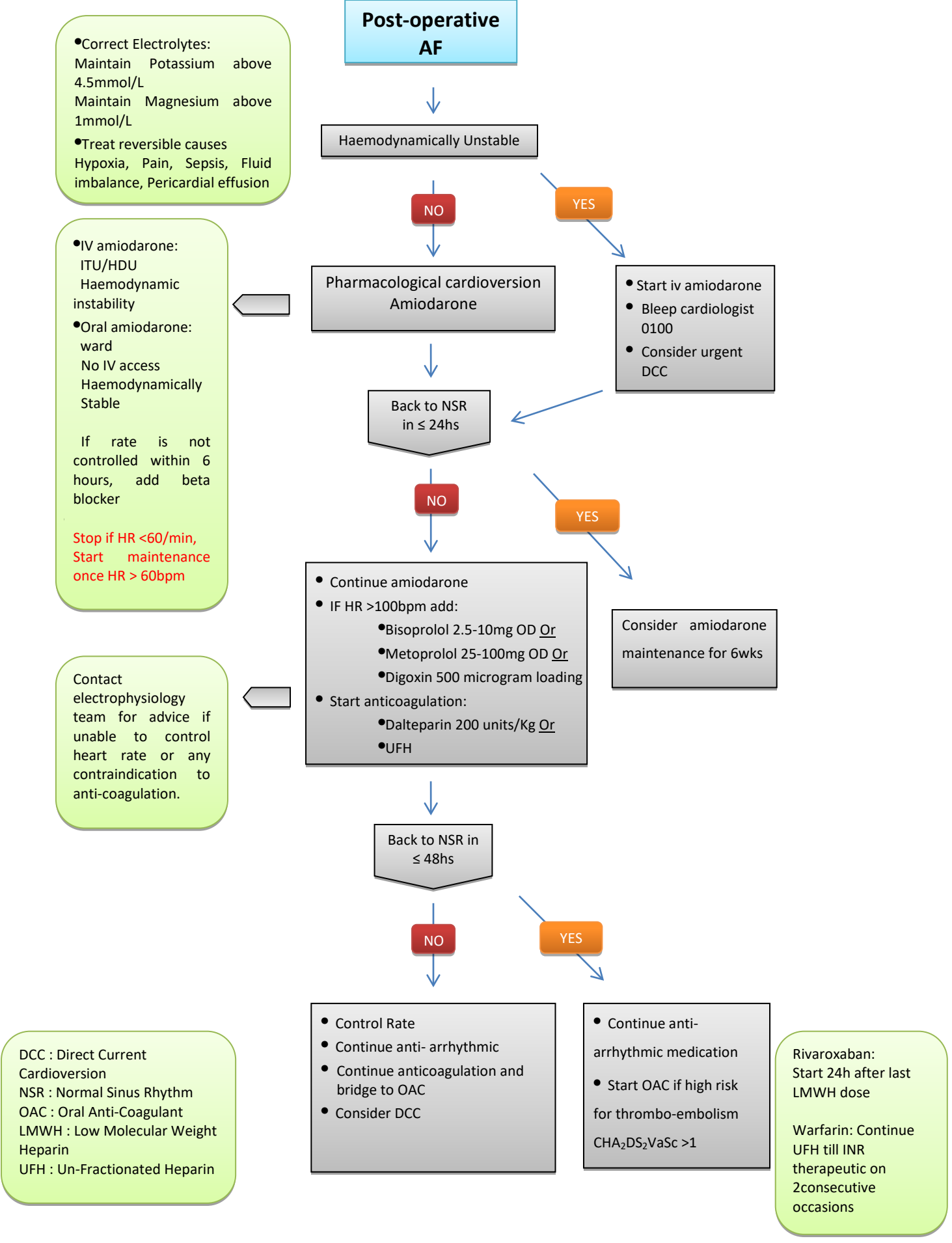
Follow up visit:

At the 6week follow up visit an ECG must be done to confirm the rhythm

- If patient is back to normal sinus rhythm (NSR), stop amiodarone or digoxin and oral anticoagulants (if there is no other indication).
- Continue beta blockers
- If patient is still in AF continue anti-arrhythmic medications and oral anti-coagulants. Discuss with Electrophysiology (EP team) for Direct Current Cardioversion (DCC) consideration.
- If the patient history suggests paroxysmal AF, continue anti-arrhythmic medications and oral anticoagulants. Refer to cardiologist for possible Holter confirmation of the underlying rhythm.

For Patients with pre-operative documented paroxysmal atrial fibrillation:

- *Use the same prophylactic measures*
- *Treat as new onset AF*
- *Even if patients is back to normal sinus rhythm, maintain patient on anti-coagulation*



•Correct Electrolytes:
Maintain Potassium above 4.5mmol/L
Maintain Magnesium above 1mmol/L

•Treat reversible causes
Hypoxia, Pain, Sepsis, Fluid imbalance, Pericardial effusion

•IV amiodarone:
ITU/HDU
Haemodynamic instability

•Oral amiodarone:
ward
No IV access
Haemodynamically Stable

If rate is not controlled within 6 hours, add beta blocker

Stop if HR <60/min,
Start maintenance once HR > 60bpm

Contact electrophysiology team for advice if unable to control heart rate or any contraindication to anti-coagulation.

DCC : Direct Current Cardioversion
NSR : Normal Sinus Rhythm
OAC : Oral Anti-Coagulant
LMWH : Low Molecular Weight Heparin
UFH : Un-Fractionated Heparin

Rivaroxaban:
Start 24h after last LMWH dose

Warfarin: Continue UFH till INR therapeutic on 2 consecutive occasions