

## ATRIAL FIBRILLATION

### Key points

- Not all patients require heparin bridging.
- Postop atrial fibrillation often spontaneously resolves.
- Postop atrial fibrillation often requires IV management because patients are NPO for prolonged duration.

### Preoperative evaluation

- Assess rate control, baseline EF, and presence of valvular heart disease.
- Stop 4 doses of warfarin prior to surgery. (consider longer for e.g. neurosurgery)
- Bridge with low molecular weight heparin if history of TIA/CVA, prior embolic events, or mitral stenosis. *Consider* bridge therapy if CHADS2 score is  $\geq 3$ .
- Plan for postoperative rate control and anticoagulation.
- Consider perioperative AV nodal blockers in patients in sinus rhythm who have had previous episodes of perioperative atrial fibrillation.

### Postoperative management

#### Pre-existing atrial fibrillation:

- Rate control (i.e. for maintenance control of heart rate). If NPO, give IV metoprolol (start 5 mg IV q6h, titrate to HR 60-80) or diltiazem drip. Continue digoxin if already receiving at baseline.
- Transition to usual PO meds when taking POs.
- Resume anticoagulation when surgically acceptable. Bridge with heparin if indicated.

#### New-onset postop atrial fibrillation:

- Identify precipitating causes (CHF, electrolyte imbalance, infection, infarction, alcohol withdrawal, thyroid abnormalities, anemia, hypovolemia, lung disease, valvular heart disease, pulmonary embolism, volume overload/reabsorbed third spacing).
- Echocardiogram is indicated to assess LVEF and for valvular heart disease.
- Rate control (for atrial fibrillation with rapid ventricular response):

Metoprolol	5 mg IV x 1. May repeat x 2 if additional rate control needed and BP remains stable.
Diltiazem	Bolus 10-20 mg IV, then start IV drip at 10-20 mg per hour, titrate to HR 80-100.
Digoxin	Acts more slowly. 0.5 mg IV x 1, then 0.25 mg IV Q6H x 2. Give daily and titrate to effect, typical dose 0.125 mg IV daily.
Amiodarone	150 mg IV bolus, then load with 1 mg/min IV x 6 hrs, then 0.5 mg/min x 18 hrs. Indicated for refractory atrial fibrillation, heart failure. Check baseline TSH, PFTs.
Esmolol	50-300 mcg/kg/min IV. Can bolus 150-300 mcg/kg IV initially. Watch for hypotension.
PO medications	Multiple options: Metoprolol, atenolol, diltiazem. PO digoxin and amiodarone if indicated. Generally start with IV agents if tachycardic and rate control needed urgently.

## Cardiology

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- Anticoagulation: Postop atrial fibrillation often resolves spontaneously—do not need to anticoagulate unless >48 hrs of atrial fibrillation. Start anticoagulation after 48 hrs IF bleeding risk is acceptable (must discuss with surgery team) AND the patient meets criteria for anticoagulation.<sup>1,2</sup>

No risk factors	ASA 81-325 mg daily
1 moderate-risk factor	Aspirin 81-325 mg daily or warfarin (INR 2-3)
Any high-risk factor or >1 moderate risk factor	Warfarin (INR 2-3)
<b>Moderate-risk factors:</b> Age $\geq 75$ , HTN, Heart Failure, LVEF $\leq 35\%$ , DM.	
<b>High-risk factors:</b> Previous stroke, TIA, or embolism; mitral stenosis, prosthetic heart valve (higher INR target if indicated)	

## Discussion

### Anticoagulation and bridging therapy:

- Warfarin does not need to be stopped for certain procedures, e.g. dental extractions, cataract surgery. Make sure INR is <3.0 and communicate with surgeon to confirm.
- Individualize anticoagulation recommendations for the type of surgery (e.g. neurosurgery, spine surgery, and highly vascular tumors may require a longer period off of anticoagulation), the surgeon's preference, and the baseline dose of warfarin (patients requiring lower doses tend to have INRs that fall less quickly).
- Most patients do not require bridge therapy (the short-term risk of stroke is low).
- Low molecular weight heparin therapy can be expensive—check with patient's insurance for coverage. Additionally, it is not reversible, a significant postop consideration.
- Do not assume outpatient procedures are automatically low risk for post-procedure surgical bleeding. Discussion with the surgeon or interventionalist (e.g. angioembolization) should be undertaken.

### Rhythm control:

- Consider rhythm control when:
  - There is hemodynamic instability ( $\rightarrow$  DC cardioversion)
  - Atrial fibrillation is poorly tolerated: severe valvular heart disease, especially mitral stenosis, ischemia, CHF
  - Refractory rapid ventricular response persists despite initial attempts with AV nodal blocker.
- Consider amiodarone in atrial fibrillation that is refractory to rate control, patients with LV dysfunction, or in patients with decompensated CHF.
- Cardiac surgery patients have a high incidence of postoperative atrial fibrillation, and are routinely given prophylactic beta-blockers. The use of other agents in cardiac surgery is beyond the scope of this handbook.

**Decision to anticoagulate:**

- Consider using the CHADS2 risk score for non-valvular atrial fibrillation (differs slightly from the AHA recommendations above).<sup>3</sup>

Risk factors: 1 point for CHF, HTN, Age >75, DM; 2 points for history of TIA/CVA.

Score	Annual stroke risk	Anticoagulation
0	1.9	ASA
1	2.8	ASA or warfarin
2	4.0	Warfarin
3	5.9	Warfarin
4+	>7%	Warfarin

However, if the CHADS2 score is 2 because of history of TIA/CVA, the annual stroke risk is likely *greater* than 4%.

Some elect to use ASA therapy for patients with CHADS2 score of 2.

- If atrial fibrillation persists >48 hours but resolves by discharge, then it may still be reasonable not to anticoagulate, depending on the precipitant and the patient’s risk factors.
- Paroxysmal vs. persistent atrial fibrillation:
  - For non-surgical patients, we generally do not distinguish paroxysmal from persistent atrial fibrillation with regard to the decision to anticoagulate.
  - Postop patients, however, commonly have brief episodes of atrial fibrillation that resolve once the postoperative stress is over, and they do not necessarily require commitment to lifelong anticoagulation.

**References**

- Fuster V, Ryden LE, Asinger RW, et al. ACC/AHA/ESC guidelines for the management of patients with atrial fibrillation: executive summary. *J Am Coll Cardiol.* 2001;38:1231-1266.
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- Goldstein LB, Adams R, Alberts MJ, et al. *Circulation.* 2006;113:e873-923.