**ED Management of Atrial Fibrillation Algorithm**

### Additional Details

1. History, vitals, TSH, CBC, BMP and CXR rules out hyperthyroid, infection, new/severe anemia, renal failure, PE, etc. (SBP<80, T>100.5, O2 sat<90%, GFR<40)

2. Signs and symptoms of heart failure (pulmonary edema, elevated JVP, elevated BNP), hemodynamic instability, ST depressions ≥ 2mm or STE, trop >0.1. Ask about orthopnea, PND, edema.

3. High risk= prior TIA or stroke, thromboembolism, rheumatic heart disease, artificial valve, systolic heart failure

4. Option per MD and patient. Zoll defibrillator: start 75J, repeat with 120J then 150J if does not convert. Lifepak defibrillator: 200J biphasic synchronized shock, repeat 360J if 200J does not convert. Pre-procedural SC enoxaparin if not therapeutic on oral anticoagulation.

5. Target-specific anticoagulant with no missed doses or warfarin with consistent INR> 2. (AHA Class I, LOE B) Consider TEE if unclear with therapeutic anticoagulation peri and post procedure. (AHA Class IIa, LOE B)

6. Metoprolol 2.5-5mg IV +/- 50mg PO. Diltiazem 0.25mg/kg IV bolus then 5-15mg/hr +/- 30mg PO. Repeat IV prn. Home dose per HR/BP

See [Rate Control Dosing Table](#) for options.

7. With some exceptions, anticoagulation for 24 weeks post cardioversion. (AHA Class I, LOE B) If warfarin used for cardioversion patients, consider bridging with enoxaparin until INR is therapeutic. Cardiologist to determine duration. If warfarin is used in a patient that is being rate controlled, an enoxaparin bridge is not needed.

See [Anticoagulation Flow Diagram](#) for options.

**NOTE:** For low risk patients (CHA2DS2-VASc ≤ 1) with atrial fibrillation < 48 hours, give pre-procedural enoxaparin. Post-procedure anticoagulation is not necessary in patients with CHA2DS2-VASc = 0. (AHA Class IIb, LOE C) Post-procedure anticoagulation may be considered in patients with CHA2DS2-VASc = 1.

### Suggested Post-Discharge Follow-up

**NOTE:** All patients may be considered for referral to Cardiology.

- **By Primary Care Provider:**
  - Patients with known AF w/o heart failure or high risk features previously managed by PCP
  - Patients with new onset (first occurrence)

- **By Cardiologist:**
  - Patients with known AF and regularly followed by cardiologist (or seen by cardiologist within the last 2 yrs.)

### References


Table 1. Common Medications for Atrial Fibrillation Rate Control

<table>
<thead>
<tr>
<th>Medication</th>
<th>IV Administration</th>
<th>Oral Maintenance Dose</th>
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</thead>
<tbody>
<tr>
<td>Metoprolol tartrate</td>
<td>2.5-5.0 mg IV bolus over 2 min; up to 3 doses</td>
<td>25 - 100 mg BID</td>
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<tr>
<td>Metoprolol XL (succinate)</td>
<td>---</td>
<td>50 - 400 mg QD</td>
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<tr>
<td>Atenolol</td>
<td>---</td>
<td>25 - 100 mg QD</td>
</tr>
<tr>
<td>Esmolol</td>
<td>500 mcg/kg IV bolus over 1 min, then 50-300 mcg/kg/min IV</td>
<td>---</td>
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<tr>
<td>Propranolol</td>
<td>1 mg IV over 1 min, up to 3 doses at 2 min intervals</td>
<td>10 - 40 mg TID or QID</td>
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<tr>
<td>Nadolol</td>
<td>---</td>
<td>10 - 240 mg QD</td>
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<tr>
<td>Carvedilol</td>
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<td>3.125 - 25 mg BID</td>
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<tr>
<td>Bisoprolol</td>
<td>---</td>
<td>2.5 - 10 mg daily</td>
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<tr>
<td><strong>Beta blockers</strong></td>
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<tr>
<td>Verapamil</td>
<td>(0.075-0.15 mg/kg) IV bolus over 2 min, may give an additional 10 mg after 30 min if no response, then 0.005 mg/kg/min infusion</td>
<td>180 - 480 mg QD (ER)</td>
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<tr>
<td>Diltiazem</td>
<td>0.25 mg/kg IV bolus over 2 min, then 5-15 mg/h</td>
<td>120-360 mg QD (ER)</td>
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<tr>
<td><strong>Nondihydropyridine calcium channel antagonists</strong></td>
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<tr>
<td>Digoxin</td>
<td>0.25 mg IV with repeat dosing to a maximum of 1.5 mg over 24 hrs.</td>
<td>0.125 – 0.25 mg QD</td>
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<tr>
<td><strong>Digitalis glycosides</strong></td>
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<tr>
<td>Amiodarone</td>
<td>300 mg IV over 1 hr, then 10-50 mg/hr over 24 hrs.</td>
<td>100 - 200 mg QD</td>
</tr>
</tbody>
</table>

BID = twice daily; ER = extended release; QD = once daily; QID = four times a day; TID = three times a day

Last revised: 04/2015
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Contact CCKM for questions or revisions.

Anticoagulation Flow Diagram

Start

Any type of prosthetic valve, rheumatic mitral stenosis or mitral valve repair?*

Yes

Use warfarin

No

Age (years)

> 75

Use warfarin

< 75

CrCl (mL/min)

> 15

Yes

History of GI bleed?

No

< 15

Use warfarin^<br>~ 15

> 75

Use warfarin^<br>~ 15

< 75

Use warfarin or apixaban

Yes

History of GI bleed?

No

Use warfarin, dabigatran, rivaroxaban, or apixaban

Yes

History of GI bleed?

No

Use warfarin or apixaban

Yes

History of GI bleed?

No

Use warfarin, rivaroxaban, or apixaban

*The use of TSOACs with mechanical valves is contraindicated. There are no data in patients with bioprosthetic valves.