Atrial Fibrillation (AF) and Atrial Flutter
Inpatient Management - Adult

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PCI = percutaneous coronary intervention

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**PATIENT PRESENTATION**

Suspected new onset AF/atrial flutter

Initiate a Goal Concordant Care (GCC) conversation\(^1\) with the patient, or if clinically indicated, with the Patient Representative, and the Primary Oncologist/Primary Team/Attending Physician. The Advance Care Planning (ACP) note should be used to document GCC discussion.

**ASSESSMENT**

Is the patient hemodynamically stable?

- Yes
- No

**Perform EKG to confirm AF/atrial flutter**

- • Initiate transfer to cardiac monitoring bed\(^2,3\)
- • Assessment and prompt treatment of underlying medical condition and/or correction of modifiable risk factors\(^4\)

Time of onset < 48 hours?

- Yes
- No

**See Page 3**

**See Page 4**

- • Obtain EKG and echocardiogram and consult Cardiology
- • Assess for management of AF/atrial flutter and long term anticoagulation, see Page 6

**Initiate emergent electrical cardioversion (synchronized biphasic at 100-200 joules), per advanced cardiac life support (ACLS)**

**Immediately initiate LMWH or IV UFH at presentation if no contraindications\(^5\), but do not delay cardioversion**

LMWH = low molecular weight heparin
UFH = unfractionated heparin

\(^1\) Refer to GCC home page (for internal use only)
\(^2\) Refer to Cardiac Monitoring Admission and Discharge Policy (#CLN0511)
\(^3\) Transfer to cardiac monitoring may not be necessary for newly-diagnosed, rate controlled asymptomatic patients in the outpatient setting
\(^4\) See Appendix A for Risk Factors for the Development of New-Onset AF/Atrial Flutter
\(^5\) See Appendix B for Contraindications to Anticoagulation Therapy

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Department of Clinical Effectiveness V4
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**PRESENTATION**

- Hemodynamically stable and
- Onset < 48 hours and
- Ongoing AF/atrial flutter

**RISKS**

- Is CHA₂DS₂-VASc score ≥ 2 for males or ≥ 3 for females?

**TREATMENT**

- Pharmacologic² cardioversion
- Anticoagulation with LMWH, IV UFH, or DOAC³ if no contraindications⁴, followed by long term anticoagulation (see Page 6)

**FOLLOW-UP**

- Termination of AF/atrial flutter in < 48 hours?
  - Yes: Follow up with Cardiology
  - No: See Page 4

---

DOAC = direct oral anticoagulant
LMWH = low molecular weight heparin
UFH = unfractionated heparin

1 See Appendix C for Risk Score for Stroke in Patients with AF/Atrial Flutter
2 See Appendix D for Ibutilide Exclusion Criteria
3 See Appendix E for Anticoagulation Therapy Options for Cancer Patients
4 See Appendix B for Contraindications to Anticoagulation Therapy
Atrial Fibrillation (AF) and Atrial Flutter
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PRESENTATION

- Hemodynamically stable and
- Onset ≥ 48 hours or unknown and
- Ongoing AF/atrial flutter

Consult Cardiology if not done previously to assess need for cardioversion

ASSESSMENT

Need for cardioversion?

TREATMENT

Yes

- Anticoagulation¹ with LMWH, IV UFH or DOAC if no contraindications² PRIOR to TEE/electrical or pharmacological cardioversion
- For elective outpatient cardioversion, consult Cardiology
- Anticoagulation¹ if no contraindications² for at least 4 weeks after cardioversion and assess for long term anticoagulation (see Page 6)

No

- For management with rate control, see Page 5
- Assess for long term anticoagulation, see Page 6

DOAC = direct oral anticoagulant
LMWH = low molecular weight heparin
TEE = transesophageal echocardiogram
UFH = unfractionated heparin

¹ See Appendix E for Anticoagulation Therapy Options for Cancer Patients
² See Appendix B for Contraindications to Anticoagulation Therapy
Atrial Fibrillation (AF) and Atrial Flutter
Inpatient Management - Adult

Rate Control
Factors to consider for treatment include:
- Persistent AF/atrial flutter
- Fewer symptoms
- Age > 65 years
- Hypertension
- No history of heart failure (HF)
- Patient preference
- Refractory to previous anti-arrhythmic drug therapy

Initiate rate controlling medications\textsuperscript{1,2,3}

Rate control < 110 bpm?

Continue regimen

Follow-up with Cardiology

Is the patient hemodynamically unstable?

Yes

Continue rate controlling medications\textsuperscript{1}

Consider admit/transfer to Intensive Care Unit (ICU)\textsuperscript{4}

Follow-up with Cardiology

No

Cardiology consult

\textsuperscript{1} Beta blockers, calcium channel blockers, digoxin. Consider Cardiology consult prior to ordering digoxin for patients with atrial fibrillation with rapid ventricular response (RVR).

\textsuperscript{2} See Appendix F for Special Considerations Regarding Drug Choice for Rate Control

\textsuperscript{3} See Appendix G for Common Medication Dosage for Rate Control of AF/Atrial Flutter

\textsuperscript{4} Criteria for admit/transfer to ICU:
- Progressive hemodynamic instability
- Failure to respond to rate control agents

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LONG TERM MANAGEMENT OF ANTICOAGULATION IN PATIENTS WITH AF/ATRIAL FLUTTER

TREATMENT

- Long term anticoagulation recommended if no contraindications\(^2,3\)
- Assess bleeding risk (see Appendix I)
  - For those who are at a high risk of bleeding, attempt to eliminate modifiable risk factors and decision to anticoagulant can be made on a case-by-case basis

- Consider long term anticoagulation if no contraindications\(^2,3\)
- Assess bleeding risk (see Appendix I) if decision is made to anticoagulate
  - For those who are at a high risk of bleeding, attempt to eliminate modifiable risk factors and decision to anticoagulant can be made on a case-by-case basis

\(\text{CHA}_2\text{DS}_2\cdot\text{VASc}\)

- high risk (score \(\geq 2\) for males or \(\geq 3\) for females)
- moderate risk (score \(1\) for males or \(2\) for females)
- low risk (score \(0\) for males or \(1\) for females)

Anticoagulation not recommended

OAC = oral anticoagulant
PCI = percutaneous coronary intervention

\(^1\) See Appendix C for Risk Scores for Stroke in Patients with AF/Atrial Flutter
\(^2\) See Appendix B for Contraindications to Anticoagulation Therapy
\(^3\) See Appendix H for Anticoagulation Recommendations for Patients on OAC for AF/Atrial Flutter needing PCI
APPENDIX A: Risk Factors for the Development of New-Onset AF/Atrial Flutter

- Acid-base abnormalities
- Advanced age
- Anemia
- Electrolyte abnormalities
- Fluid overload
- Acute coronary syndrome (ACS)
- Hypertension
- Hypothyroid
- Alcohol use
- Heart failure
- Hypotension
- Hypoxemia
- Male sex
- Obesity
- Recent (within 24-48 hours) thoracic surgery (e.g., esophageal, lung, heart)

APPENDIX B: Contraindications to Anticoagulation Therapy

Absolute contraindications:
- Major active bleeding (bleeding requiring > 2 units packed red blood cells (PRBC) transfusion, decrease in hemoglobin by ≥ 2 g/dL, or bleeding in a critical area or organ)
- Platelet count < 25 K/microliter, consult to Benign Hematology
- Spinal procedure and/or epidural placement ¹
- Severe uncontrolled malignant hypertension

Relative contraindications:
- Brain metastases with higher risk of bleeding (renal, choriocarcinoma, melanoma, thyroid cancer)
- Intracranial or central nervous system (CNS) bleeding within the past 4 weeks
- Recent high-risk surgery or bleeding event
- Active but non-life threatening bleeding
- Active gastrointestinal (GI) ulceration at high risk of bleeding
- Platelet count < 50 K/microliter, consider consult to Benign Hematology
- Patient on active protocol that prohibits use of anticoagulation

¹ Refer to Peri-Procedure Management of Anticoagulants algorithm

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APPENDIX C: Risk Score for Stroke in Patients with AF/Atrial Flutter

<table>
<thead>
<tr>
<th>Condition</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Congestive Heart Failure</td>
<td>1</td>
</tr>
<tr>
<td>H Hypertension: blood pressure consistently above 140/90 mmHg (or treated hypertension on medication)</td>
<td>1</td>
</tr>
<tr>
<td>A₂ Age ≥ 75 years</td>
<td>2</td>
</tr>
<tr>
<td>D Diabetes mellitus</td>
<td>1</td>
</tr>
<tr>
<td>S₂ Prior stroke or TIA or thromboembolism</td>
<td>2</td>
</tr>
<tr>
<td>V Vascular disease</td>
<td>1</td>
</tr>
<tr>
<td>A Age 65-74</td>
<td>1</td>
</tr>
<tr>
<td>S₂ Sex category (1 point for female)</td>
<td>1</td>
</tr>
</tbody>
</table>

TIA = transient ischemic attack

APPENDIX D: Ibutilide Exclusion Criteria

- Bundle branch block (BBB) (QRS > 120 ms)
- Preexisting 2nd/3rd degree atrioventricular block (AVB)
- Prolonged QT (QTc > 480) or Brugada syndrome
- Serum potassium < 3 mEq/liter
- Patient already on an antiarrhythmic
- Pregnancy
- Severe hepatic or renal insufficiency with creatinine clearance (CrCl) < 35 mL/minute
# APPENDIX E: Anticoagulation Therapy Options for Cancer Patients

## LMWH Regimens for Treatment of Cancer Associated Thrombosis

<table>
<thead>
<tr>
<th>DRUG</th>
<th>DOSE/ROUTE/FREQUENCY</th>
<th>MONITORING</th>
<th>DOSE ADJUSTMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enoxaparin</td>
<td>1 mg/kg subcutaneously every 12 hours or 1.5 mg/kg subcutaneously once daily in selected patients</td>
<td>● Baseline: Hemoglobin/hematocrit, platelet count, SCr and aPTT/PT&lt;br&gt; ● Therapeutic laboratory tests: Routine monitoring not required. However, antifactor Xa levels may be useful in certain high-risk patients (e.g., obesity, malnutrition, renal insufficiency, and unexplained bleeding or thrombosis)&lt;br&gt; ● Surgical inpatient: o Hemoglobin/hematocrit and platelet count 24 hours after starting LMWH, then every 3 days from days 4-14 unless LMWH is stopped or patient is discharged o After day 14, hemoglobin/hematocrit and platelet count at least once weekly&lt;br&gt; ● Medical inpatient and all outpatient: o New start: For medical patients, hemoglobin/hematocrit and platelet count at least once weekly. For outpatient, no other monitoring needed except platelet count at least once during the first 14 days of therapy if prior recent (within 30 days) exposure to heparin or LMWH.&lt;br&gt; o Maintenance therapy: Hemoglobin/hematocrit, platelet count, serum creatinine, and hepatic function tests at least once yearly&lt;br&gt; - If CrCl 30-60 mL/minute, serum creatinine every 6 months&lt;br&gt; - If CrCl &lt; 30 mL/minute, serum creatinine every 3 months</td>
<td>Renal:&lt;br&gt; ● If CrCl 20-30 mL/minute: 1 mg/kg once daily&lt;br&gt; ● If CrCl &lt; 20 mL/minute: Avoid use of enoxaparin&lt;br&gt; Weight:&lt;br&gt; ● Obtain anti-Xa level in patients with weight &lt; 50 kg or weight &gt; 150 kg or BMI ≥ 40 kg/m²&lt;br&gt; ○ For 1 mg/kg every 12 hour dosing regimen: Adjust dose to obtain anti-Xa level of 0.6-1 IU/mL (4-6 hours after fourth dose)&lt;br&gt; ○ For 1.5 mg/kg once daily dosing regimen: Adjust dose to obtain anti-Xa level of 1-2 IU/mL (4-6 hours after fourth dose)&lt;br&gt; Platelet count:&lt;br&gt; ● Limited data suggest the following dose modification:&lt;br&gt; ○ For platelet count &gt; 50 K/microliter: Full dose of 1 mg/kg every 12 hour; alternative dose is 1.5 mg/kg once daily&lt;br&gt; ○ For platelet count between 25-50 K/microliter: Half dose of 0.5 mg/kg every 12 hours&lt;br&gt; ○ For platelet count &lt; 25 K/microliter: Hold all anticoagulants</td>
</tr>
</tbody>
</table>

CrCl = creatinine clearance (mL/minute); LMWH = low molecular weight heparin; SCr = serum creatinine

1 Prior to anticoagulation therapy, assess for bleeding risk (see Appendix I)
2 For bleeding complications refer to Emergency Anticoagulation Reversal Order Set
3 If lab results indicate heparin induced thrombocytopenia, follow management per Heparin Induced Thrombocytopenia (HIT) Treatment algorithm
4 See the Anticoagulant Management and Required Laboratory Monitoring Policy (#CLN0984)
Unfractionated Heparin (UFH)

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>MONITORING³⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV heparin infusion (refer to Adult Heparin Infusion Order Set for dosing)</td>
<td>• Baseline: Hemoglobin/hematocrit, platelet count, and aPTT/PT</td>
</tr>
<tr>
<td></td>
<td>• Therapeutic laboratory tests: aPTT to achieve specified target range per protocol for therapeutic doses</td>
</tr>
<tr>
<td></td>
<td>• Inpatient:</td>
</tr>
<tr>
<td></td>
<td>○ Hemoglobin/hematocrit and platelet count 24 hours after starting heparin infusion, then every 2 days from days 4-14 unless heparin is stopped</td>
</tr>
<tr>
<td></td>
<td>○ After day 14, hemoglobin/hematocrit and platelet count at least once weekly</td>
</tr>
<tr>
<td></td>
<td>• Outpatient:</td>
</tr>
<tr>
<td></td>
<td>○ New start: Platelet count at least once during the first 14 days of therapy regardless of prior exposure history</td>
</tr>
<tr>
<td></td>
<td>○ Maintenance therapy: Hemoglobin/hematocrit and platelet count every 3 months</td>
</tr>
</tbody>
</table>

Warfarin (Selected Vitamin K Antagonist) – For long-term management

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>MONITORING³⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Overlap warfarin (2.5-5 mg PO) with induction therapy (low molecular weight heparin (LMWH) or Factor Xa Inhibitor) beginning on Day 1 of therapy</td>
<td>• General INR goal: 2-3</td>
</tr>
<tr>
<td>• Continue induction therapy until INR ≥ 2 for two days, AND patient has received at least 4-5 days of induction therapy overlap</td>
<td>• Mechanical aortic valve, INR goal: 2-3</td>
</tr>
<tr>
<td></td>
<td>• Mechanical mitral valve, INR goal: 2.5-3.5</td>
</tr>
<tr>
<td></td>
<td>• Baseline: Hemoglobin/hematocrit, platelet count, PT/INR, and hepatic function tests</td>
</tr>
<tr>
<td></td>
<td>• Therapeutic laboratory tests: INR to achieve specified target range</td>
</tr>
<tr>
<td></td>
<td>• Inpatient: Hemoglobin/hematocrit, platelet count, and INR at least once weekly</td>
</tr>
<tr>
<td></td>
<td>• Outpatient: INR every 3 months at a minimum; hemoglobin/hematocrit, platelet count, serum creatinine, and hepatic function tests at least once year</td>
</tr>
</tbody>
</table>

1 Prior to anticoagulation therapy, assess for bleeding risk (see Appendix 1)
2 For bleeding complications refer to Emergency Anticoagulation Reversal Order Set
3 If lab results indicate heparin induced thrombocytopenia, follow management per Heparin Induced Thrombocytopenia (HIT) Treatment algorithm
4 See the Anticoagulant Management and Required Laboratory Monitoring Policy (#CLN0984)
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APPENDIX E: Anticoagulation Therapy Options for Cancer Patients\(^1\,^2\) - continued

### Fondaparinux (Arixtra\(^6\)) (Factor Xa Inhibitor)\(^3\) – Fondaparinux dose subcutaneously daily

<table>
<thead>
<tr>
<th>ACTUAL BODY WEIGHT (kg)</th>
<th>FONDAPARINUX DOSE</th>
<th>MONITORING(^3,^4)</th>
<th>DOSE ADJUSTMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50</td>
<td>5 mg</td>
<td>● Baseline: Hemoglobin/hematocrit, platelet count, aPTT/PT, and serum creatinine&lt;br&gt;● Therapeutic laboratory tests: Routine monitoring not required. However, antifactor Xa levels may be useful in certain high-risk patients (e.g., obesity, malnutrition, renal insufficiency, and unexplained bleeding or thrombosis)&lt;br&gt;● Inpatient: Hemoglobin/hematocrit, platelet count, and serum creatinine at least once weekly&lt;br&gt;● Outpatient: Hemoglobin/hematocrit, platelet count, serum creatinine, and hepatic function tests at least once yearly&lt;br&gt;○ If CrCl 30-60 mL/minute, serum creatinine every 6 months&lt;br&gt;○ If CrCl &lt; 30 mL/minute, serum creatinine every 3 months</td>
<td>Renal:&lt;br&gt;● If CrCl is between 30-50 mL/minute: use with caution&lt;br&gt;● If CrCl is &lt; 30 mL/minute: contraindicated&lt;br&gt;Weight:&lt;br&gt;● For BMI ≥ 40 kg/m(^2): no dose adjustment necessary&lt;br&gt;Platelet count:&lt;br&gt;● Use fondaparinux with caution in patients with platelet count &lt; 100 K/microliter</td>
</tr>
<tr>
<td>50 – 100</td>
<td>7.5 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 100</td>
<td>10 mg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CrCl = creatinine clearance (mL/minute)

1 Prior to anticoagulation therapy, assess for bleeding risk (see Appendix I)
2 For bleeding complications refer to Emergency Anticoagulation Reversal Order Set
3 If lab results indicate heparin induced thrombocytopenia, follow management per Heparin Induced Thrombocytopenia (HIT) Treatment algorithm
4 See the Anticoagulant Management and Required Laboratory Monitoring Policy (#CLN0984)

Continued on next page
## APPENDIX E: Anticoagulation Therapy Options for Cancer Patients - continued

Direct Oral Anticoagulants (DOACs)\(^1\,^2\) are suggested for prevention of thromboembolism in patients with atrial fibrillation. There is no evidence available with DOACs management in cancer patients who experience chemotherapy induced thrombocytopenia. DOACs are not recommended in patients with active gastrointestinal cancer.

<table>
<thead>
<tr>
<th>DOACs(^1,^2), Rivaroxaban (Xarelto(^6)) Oral Factor Xa Inhibitor</th>
<th>Apixaban (Eliquis(^8)) Oral Factor Xa Inhibitor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-valvular atrial fibrillation (NVAF)</strong>&lt;br&gt;Not for any heart valve</td>
<td><strong>Apixaban</strong>&lt;br&gt;CrCl ≤ 50 mL/minute&lt;br&gt;15 mg once daily with food in evening&lt;br&gt;ESRD on HD&lt;br&gt;Strong CYP 3A4 inhibitors (ketocazole, itraconazole, ritonavir, clarithromycin) and P-gp inhibitors&lt;br&gt;Decrease current dose by 50% [If on 2.5 mg twice daily then AVOID]</td>
</tr>
<tr>
<td>CrCl &gt; 50 mL/minute&lt;br&gt;20 mg once daily with food in evening&lt;br&gt;Age ≥ 80 years&lt;br&gt;Weight ≤ 60 kg&lt;br&gt;SCr ≥ 1.5 mg/dL</td>
<td>0-1 criterion: 5 mg twice daily&lt;br&gt;2-3 criteria: 2.5 mg twice daily&lt;br&gt;5 mg twice daily&lt;br&gt;If age ≥ 80 years or body weight ≤ 60 kg then 2.5 mg twice daily</td>
</tr>
</tbody>
</table>

| **Use in liver disease**<br>CTP\(^3\) class B or C: NOT recommended | Use in CTP\(^3\) class C not recommended and there is limited experience for use in class B |

<table>
<thead>
<tr>
<th><strong>Significant drug-drug interactions</strong>(^4)</th>
<th>P-glycoprotein and CYP 3A4 interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class specific contraindications</strong>&lt;br&gt;Moderate to severe mitral stenosis or mechanical heart valve</td>
<td>Moderate to severe mitral stenosis or mechanical heart valve</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitoring parameters</th>
<th>Monitoring parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Baseline: Hemoglobin/hematocrit, platelet count, aPTT/PT, SCr, and hepatic function tests&lt;br&gt;● Therapeutic laboratory tests: Routine monitoring not required. However, antifactor Xa levels may be useful in certain high-risk patients (e.g., obesity, malnutrition, renal insufficiency, and unexplained bleeding or thrombosis). Antifactor Xa levels are only available for apixaban and rivaroxaban currently.</td>
<td>● Inpatient: Hemoglobin/hematocrit, platelet count, and SCr at least once weekly&lt;br&gt;● Outpatient: Hemoglobin/hematocrit, platelet count, SCr, and hepatic function tests at least once yearly&lt;br&gt;○ If CrCl 30-60 mL/minute, serum creatinine every 6 months&lt;br&gt;○ If CrCl &lt; 30 mL/minute, serum creatinine every 3 months</td>
</tr>
</tbody>
</table>

\(^{1}\) Prior to anticoagulation therapy, assess for bleeding risk (see Appendix I)<br>\(^{2}\) For bleeding complications refer to Emergency Anticoagulation Reversal Order Set<br>\(^{3}\) See Appendix J for Child-Turcotte-Pugh (CTP) Scoring System<br>\(^{4}\) Assessing for drug-drug interactions: Lexicomp\(^6\) or Micromedex\(^8\), available at insidemdanderson.org (for internal use only)

CrCl = creatinine clearance (mL/minute); CTP = Child-Turcotte-Pugh score; ESRD = end stage renal disease; HD = hemodialysis; SCr = serum creatinine

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**APPENDIX E: Anticoagulation Therapy Options for Cancer Patients - continued**

Direct Oral Anticoagulants (DOACs)\(^1\).\(^2\) are suggested for prevention of thromboembolism in patients with atrial fibrillation. There is no evidence available with DOACs management in cancer patients who experience chemotherapy induced thrombocytopenia. DOACs are not recommended in patients with active gastrointestinal cancer.

### Direct Oral Anticoagulants (DOACs)\(^1\).\(^2\)

<table>
<thead>
<tr>
<th>DOACs(^1).(^2)</th>
<th>Edoxaban (Savaysa(^3)) Oral Factor Xa Inhibitor</th>
<th>Dabigatran (Pradaxa(^4)) Direct Thrombin Inhibitor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-valvular atrial fibrillation (NVAF)</strong>&lt;br&gt;&lt;i&gt;Not for any heart valve**&lt;br&gt;<strong>CrCl &gt; 95 mL/minute</strong>&lt;br&gt;MUST assess CrCl before initiating</td>
<td>Avoid use</td>
<td>CrCl &gt; 30 mL/minute&lt;br&gt;75 mg twice daily</td>
</tr>
<tr>
<td>CrCl &gt; 50 mL/minute to ≤ 95 mL/minute</td>
<td>60 mg daily</td>
<td>CrCl 15-30 mL/minute&lt;br&gt;75 mg twice daily&lt;br&gt;CrCl 30-50 mL/minute and P-glycoprotein (Pgp-I) &lt;br&gt;dronaderone or ketoconazole</td>
</tr>
<tr>
<td>CrCl 15-50 mL/minute</td>
<td>30 mg daily</td>
<td>CrCl &lt; 30 mL/minute and P-glycoprotein inhibitor (Pgp-I) &lt;br&gt;Avoid use</td>
</tr>
<tr>
<td>CrCl &lt; 15 mL/minute</td>
<td>Avoid use</td>
<td>Any P-glycoprotein inducer &lt;br&gt;Avoid use</td>
</tr>
</tbody>
</table>

**Use in liver disease**<br>CTP\(^4\) class B or C: NOT recommended<br>Use in liver disease<br>No recommendations by manufacturer

**Class specific contraindications**<br>P-glycoprotein and CYP 3A4 interactions<br>Moderate to severe mitral stenosis or mechanical heart valve

**Significant drug-drug interactions**<br>P-glycoprotein and CYP 3A4 interactions<br>P-glycoprotein interactions

**Monitoring parameters**

- Baseline: Hemoglobin/hematocrit, platelet count, aPTT/PT, SCr, and hepatic function tests
- Therapeutic laboratory tests: Routine monitoring not required.
  - Edoxaban: Antifactor Xa levels may be useful in certain high-risk patients (e.g., obesity, malnutrition, renal insufficiency, and unexplained bleeding or thrombosis)
  - Dabigatran: Thrombin time (TT) may be useful in certain high-risk patients (e.g., obesity, malnutrition, renal insufficiency, and unexplained bleeding or thrombosis)

**CrCl = creatinine clearance (mL/minute); CTP = Child-Turcotte-Pugh score; HD = hemodialysis; LMWH = low molecular weight heparin; SCr = serum creatinine**

\(^1\) Prior to anticoagulation therapy, assess for bleeding risk (see Appendix I)
\(^2\) For bleeding complications refer to Emergency Anticoagulation Reversal Order Set
\(^3\) Edoxaban is currently not on the MD Anderson formulary
\(^4\) See Appendix J for Child-Turcotte-Pugh (CTP) Scoring System
\(^5\) Assessing for drug-drug interactions: Lexicomp\(^5\) or Micromedex\(^5\), available at insidemdanderson.org (for internal use only)
Atrial Fibrillation (AF) and Atrial Flutter
Inpatient Management - Adult

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APPENDIX F: Special Considerations Regarding Drug Choice\(^1\) for Rate Control

<table>
<thead>
<tr>
<th>Clinical Condition</th>
<th>Drug of Choice(^1)</th>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactive airway disease (asthma, chronic obstructive pulmonary disease)</td>
<td>Calcium channel blockers</td>
<td>Beta selective beta blockers may be used with caution</td>
</tr>
<tr>
<td>Hypertension and heart failure (HF) with normal left ventricular systolic function</td>
<td>Beta blockers or calcium channel blockers</td>
<td></td>
</tr>
<tr>
<td>Left ventricular systolic dysfunction with or without HF</td>
<td>Beta blockers or digoxin</td>
<td>Beta blockers should be used with caution as not to decompensate. Calcium channel blockers are contraindicated.</td>
</tr>
<tr>
<td>No other cardiovascular disease</td>
<td>Beta blockers or calcium channel blockers</td>
<td></td>
</tr>
</tbody>
</table>

APPENDIX G: Common Medication Dosage for Rate Control of AF/Atrial Flutter\(^2\,\(^3\))

<table>
<thead>
<tr>
<th>Intravenous Administration</th>
<th>Usual Oral Maintenance Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beta Blockers</strong></td>
<td></td>
</tr>
<tr>
<td>Metoprolol tartrate</td>
<td>2.5-5 mg IV bolus over 2 minutes; up to 3 doses</td>
</tr>
<tr>
<td>Metoprolol succinate (XL)</td>
<td>N/A</td>
</tr>
<tr>
<td>Atenolol</td>
<td>N/A</td>
</tr>
<tr>
<td>Esmolol</td>
<td>500 mcg/kg IV bolus over 1 minute, then 50-300 mcg/kg/minute IV</td>
</tr>
<tr>
<td>Propranolol</td>
<td>1 mg IV over 1 minute, up to 3 doses at 2-minute intervals</td>
</tr>
<tr>
<td>Nadolol</td>
<td>N/A</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>N/A</td>
</tr>
<tr>
<td>Bisoprolol</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Nondihydropyridine Calcium Channel Blockers**

| Verapamil                  | 0.075-0.15 mg/kg IV bolus over 2 minutes; may give an additional 10 mg after 30 minutes if no response, then 0.005 mg/kg/minute infusion |
| Diltiazem                  | 0.25 mg/kg IV bolus over 2 minutes, then 5-15 mg/hour |

| **Digitalis Glycosides\(^4\)** |                                                 |
| Digoxin                     | 8-12 mcg/kg (using ideal body weight) IV bolus to a maximum of 1 mg |

---

\(^1\) Obtain EKG for baseline pre-excitation  
\(^2\) Not to be used if evidence of pre-excitation on EKG  
\(^3\) Not to be used if evidence of pre-excitation on EKG  
\(^4\) Consider Cardiology consult prior to ordering digoxin for patients with atrial fibrillation with rapid ventricular response (RVR)
### APPENDIX H: Anticoagulation Recommendations for Patients on Oral Anticoagulant (OAC) for AF/Atrial Flutter needing PCI

<table>
<thead>
<tr>
<th>Time From PCI</th>
<th>Default Strategy</th>
<th>High Ischemic/Thrombotic Risk and Low Bleeding Risk</th>
<th>Low Ischemic/Thrombotic Risk or High Bleeding Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient stay until time of discharge after PCI (up to 1 week after PCI)</td>
<td>OAC(^4) + DAPT(^5)</td>
<td>OAC(^4) + DAPT(^5)</td>
<td>OAC(^4) + DAPT(^5)</td>
</tr>
<tr>
<td>Up to 1 month</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
<td>OAC(^4) + DAPT(^5)</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
</tr>
<tr>
<td>Up to 3 months</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
</tr>
<tr>
<td>Up to 6 months</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
</tr>
<tr>
<td>Up to 12 months</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
<td>OAC(^4) + P2Y12 inhibitor(^6)</td>
<td>OAC(^4) alone</td>
</tr>
<tr>
<td>Greater than 12 months</td>
<td>OAC(^4) alone</td>
<td>OAC(^4) alone</td>
<td>OAC(^4) alone</td>
</tr>
</tbody>
</table>

**Note:** Doses should be based on those in Appendix E except when rivaroxaban is used with P2Y12 inhibitor; the rivaroxaban dose is 15 mg daily regardless of renal function.

**DAPT** = dual antiplatelet therapy  
**DOAC** = direct oral anticoagulant  
**PCI** = percutaneous coronary intervention

1. High thrombotic risk may include patients with left main stent, multivessel PCI/stenting, etc  
2. Low risk of bleeding is defined as HAS-BLED score of 0-2 (see Appendix I)  
3. High risk of bleeding is defined as HAS-BLED score of ≥ 3 (see Appendix I)  
4. If no contraindications, DOAC is preferred over warfarin  
5. DAPT includes aspirin plus P2Y12 inhibitor. If aspirin is given with OAC, use aspirin 81 mg daily plus a proton pump inhibitor.  
6. Clopidogrel is the drug of choice for P2Y12 inhibitor; however, ticagrelor may be considered in patients with high thrombotic risk and acceptable bleeding risks (see Appendix I)
APPENDIX I: Risk Score for Bleeding in patients with AF/Atrial Flutter

<table>
<thead>
<tr>
<th>Bleeding:</th>
<th>HAS-BLED Score</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Condition</strong></td>
<td><strong>Points</strong></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>Abnormal liver or renal function (1 point each)</td>
<td>1</td>
</tr>
<tr>
<td>S</td>
<td>Stroke</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Bleeding</td>
<td>1</td>
</tr>
<tr>
<td>L</td>
<td>Labile INR</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Elderly (age &gt; 65)</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>Drugs or alcohol (1 point each)</td>
<td>1</td>
</tr>
</tbody>
</table>

High risk: ≥ 3

1 If patient has high risk of bleeding on full dose anticoagulation, consider aspirin 81 mg for anticoagulation

APPENDIX J: Child-Turcotte-Pugh (CTP) Scoring System

<table>
<thead>
<tr>
<th>Chemical and Biochemical Parameters</th>
<th>Points for Increasing Abnormality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Hepatic encephalopathy</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Ascites</td>
<td>None</td>
</tr>
<tr>
<td>Serum albumin</td>
<td>&gt; 3.5 g/dL</td>
</tr>
<tr>
<td>Total bilirubin</td>
<td>&lt; 2 mg/dL</td>
</tr>
<tr>
<td>For primary biliary cirrhosis</td>
<td>1-4 mg/dL</td>
</tr>
<tr>
<td>Prothrombin time</td>
<td>&lt; 4 seconds</td>
</tr>
<tr>
<td>prolonged or INR</td>
<td>&lt; 1.7</td>
</tr>
</tbody>
</table>

*CTP score is obtained by adding the score for each parameter.

CTP class:
- Class A = 5 to 6 points
- Class B = 7 to 9 points
- Class C = 10 to 15 points
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SUGGESTED READINGS


MD Anderson Institutional Policy #CLN1202 - Advance Care Planning Policy

Advance Care Planning (ACP) Conversation Workflow (ATT1925)


Continued on next page
SUGGESTED READINGS - continued


This practice consensus statement is based on majority opinion of the Atrial Fibrillation Management experts at the University of Texas MD Anderson Cancer Center for the patient population. These experts included:

**Core Development Team Leads**
- Jean-Bernard Durand, MD (Cardiology)
- Kaveh Karimzad, MD (Cardiology)
- Michael Kroll, MD (Benign Hematology)
- Katy Toale, PharmD (Pharmacy Quality-Regulatory)

**Workgroup Members**
- Wendy Garcia, BS*
- Vijaya Gottumukkala, MD (Anesthesiology & Perioperative Medicine)
- Poonam Jewani, PharmD (Pharmacy Clinical Programs)
- Peter Kim, MD (Cardiology)
- Carla Patel, MS, RN, ACNP (Thoracic & Cardiovascular Surgery)
- Mary Lou Warren, DNP, APRN, CNS-CC*

*Clinical Effectiveness Development Team