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

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular toMD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

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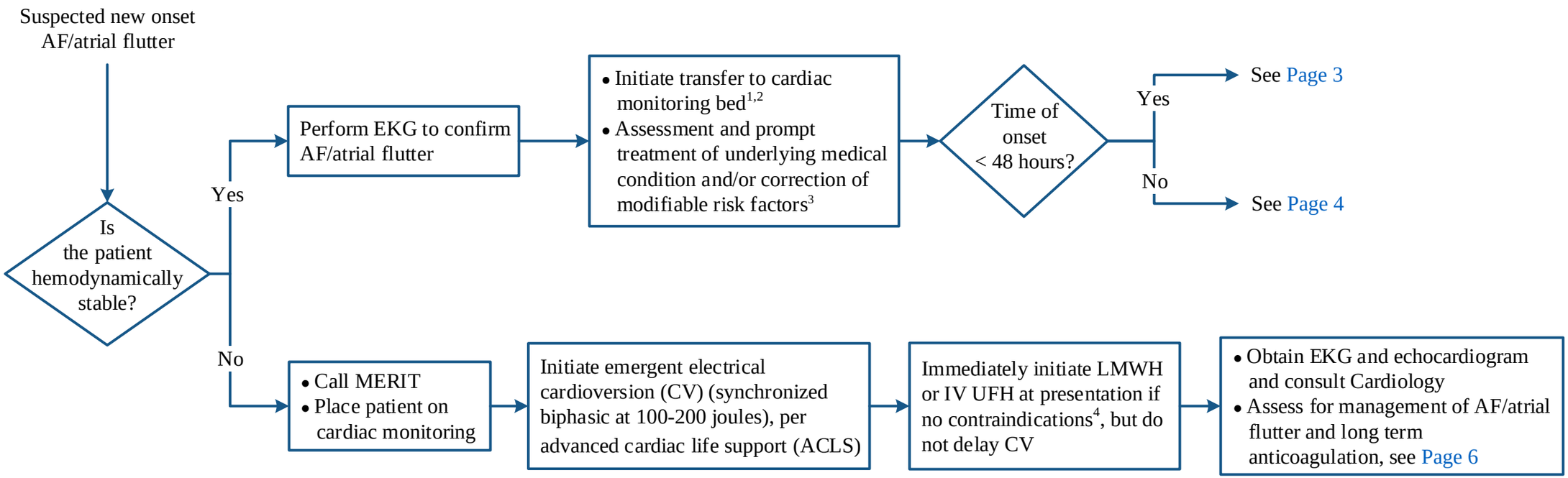
PATIENT PRESENTATION

ASSESSMENT



LMWH = low molecular weight heparin
UFH = unfractionated heparin

[1] Refer to Cardiac Monitoring Admission and Discharge Policy (MD Anderson Institutional Policy # CLN0511)
[2] Transfer to cardiac monitoring may not be necessary for newly-diagnosed, rate controlled asymptomatic patients in the outpatient setting
[3] See Appendix A for Risk Factors for the Development of New-Onset AF/Atrial Flutter
[4] See Appendix B for Contraindications to Anticoagulation Therapy

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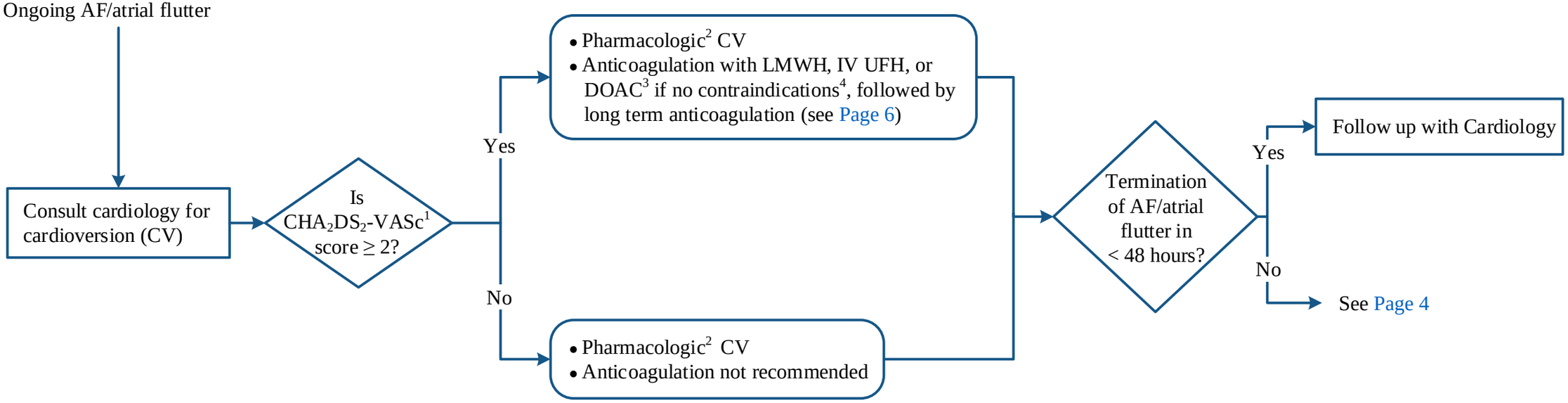
PRESENTATION **RISKS** **TREATMENT** **FOLLOW-UP**

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

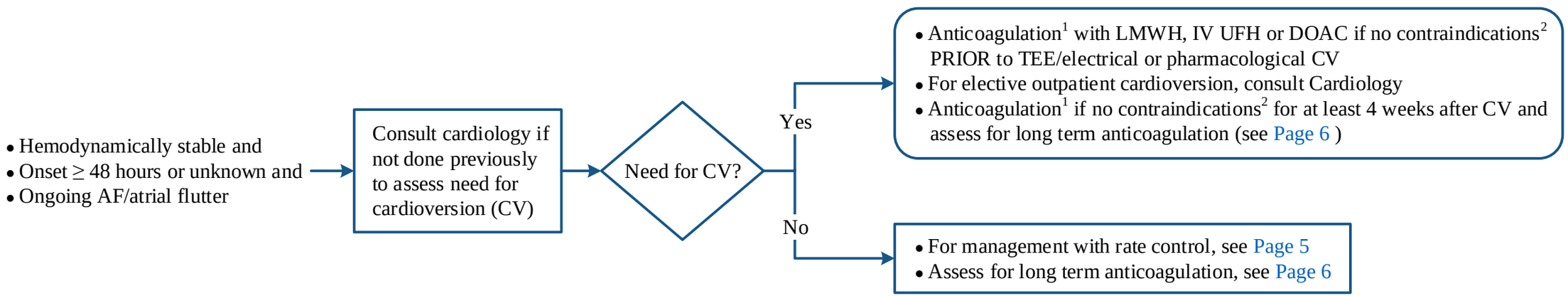


DOAC = direct oral anticoagulant
LMWH = low molecular weight heparin
UFH = unfractionated heparin

[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 Inpatient Management - Adult

PRESENTATION **ASSESSMENT** **TREATMENT**



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

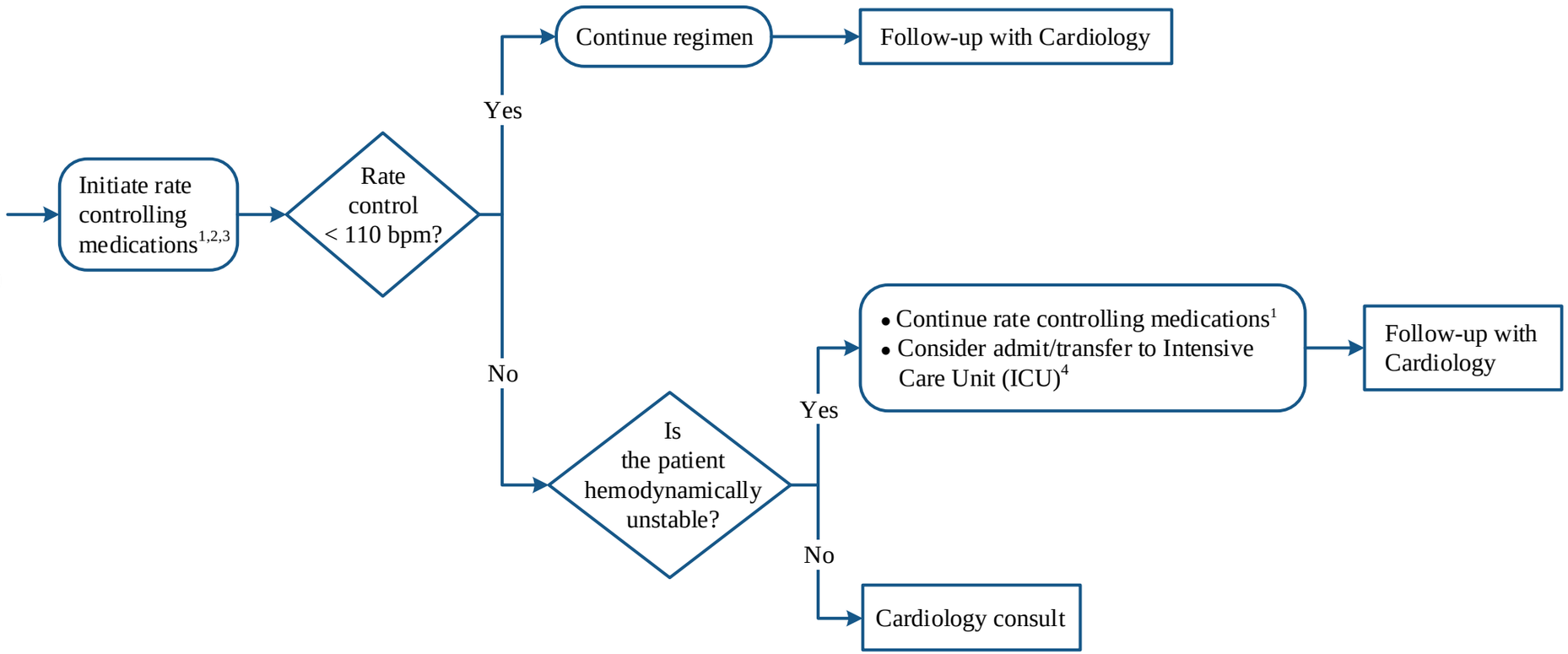
Atrial Fibrillation (AF) and Atrial Flutter Inpatient Management - Adult

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular toMD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*

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



[1] Beta blockers, calcium channel blockers, digoxin
[2] See Appendix F for Special Considerations Regarding Drug Choice for Rate Control
[3] See Appendix G for Common Medication Dosage for Rate Control of AF/Atrial Flutter
[4] Criteria for admit/transfer to ICU:
- Progressive hemodynamic instability
- Failure to respond to rate control agents

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

TREATMENT

CHA_2DS_2-VASc[1] high risk (score ≥ 2)	• Long term anticoagulation recommended if no contraindications[2,3] • Assess bleeding risk ○ 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
CHA_2DS_2-VASc[1] moderate risk (score of 1)	• Consider long term anticoagulation if no contraindications[2,3] • Assess bleeding risk 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
CHA_2DS_2-VASc[1] low risk (score of 0)	Anticoagulation not recommended

[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

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

APPENDIX A: Risk Factors for the Development of New-Onset AF/Atrial Flutter

Patient Factors:

- Acid-base abnormalities
- Advanced age
- Anemia
- Electrolyte abnormalities
- Fluid overload
- Acute coronary syndrome (ACS)
- Hypertension
- Hyperthyroid
- 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 PRBC transfusion, decrease in hemoglobin by ≥ 2 g/dL, or bleeding in a critical area or organ)
- Platelets < 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
- Platelets < 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

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

Stroke or Systemic Embolism:

$CHADS_2$ VAS_c Score

	Condition	Points
C	Congestive Heart Failure	1
H	Hypertension: blood pressure consistently above 140/90 mmHg (or treated hypertension on medication)	1
A	Age greater than or equal to 75 years	2
D	Diabetes mellitus	1
S_2	Prior stroke or TIA or thromboembolism	2
V	Vascular disease	1
A	Age 65-74	1
S_c	Sex category (1 point for female)	1

TIA = transient ischemic attack

APPENDIX D: Ibutilide Exclusion Criteria

- Bundle branch block (BBB) (QRS greater than 120 ms)
- Preexisting 2nd/3rd degree atrioventricular block (AVB)
- Prolonged QT (QTc greater than 480) or Brugada
- Potassium less than 3 mEq/liter
- Patient already on an antiarrhythmic
- Pregnancy
- Severe hepatic or renal insufficiency with creatinine clearance (CrCl) less than 35 mL/minute

APPENDIX E: Anticoagulation Therapy Options for Cancer Patients[1,2]

LMWH Regimens for Treatment of Cancer Associated Thrombosis			
DRUG	**DOSE/ROUTE/FREQUENCY**	**MONITORING**[3,4]	**DOSE ADJUSTMENTS**
Enoxaparin (Lovenox®)	1 mg/kg subcutaneously every 12 hours **or** 1.5 mg/kg subcutaneously once daily in selected patients • Limited data suggest dose of 0.75-0.85 mg/kg every 12 hours in obese patients (BMI ≥ 40 kg/m^2)	• Baseline: Hgb/Hct, platelet count, and aPTT/PT • 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 thombosis) • Surgical inpatient: ◦ Hgb/Hct and platelet count 24 hours after starting LMWH, then every 3 days from days 4-14 unless LMWH is stopped or patient is discharged ◦ After day 14, Hgb/Hct and platelet count at least once weekly • Medical inpatient and all outpatient: ◦ New start: For medical patients, Hgb/Hct 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. ◦ Maintenance therapy: Hgb/Hct, platelet count, serum creatinine, and hepatic function tests at least once yearly - If CrCl 30-60 mL/minute, serum creatinine every 6 months - If CrCl < 30 mL/minute, serum creatinine every 3 months	Renal: • If CrCl < 30 mL/minute: 1 mg/kg once daily Weight: • Obtain anti-Xa level in patients with weight < 50 kg or weight > 150 kg or BMI ≥ 40 kg/m^2 ◦ 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) ◦ 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) Platelets: • Limited data suggest the following dose modification: ◦ For platelet count > 50 K/microliter: full dose of 1 mg/kg every 12 hour; alternative dose is 1.5 mg/kg once daily ◦ For platelet count between 25-50 K/microliter: half dose of 0.5 mg/kg every 12 hours ◦ For platelet count < 25 K/microliter: hold all anticoagulants

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

Continued on next page

[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 (MD Anderson Institutional Policy #CLN0984)

APPENDIX E: Anticoagulation Therapy Options for Cancer Patients[1,2] - continued

Unfractionated Heparin (UFH)	
TREATMENT	**MONITORING[3,4]**
• IV heparin infusion (refer to Adult Heparin Infusion Order Set for dosing) • **If fixed dose, unmonitored subcutaneous UFH is chosen** ◦ Initial dose: 333 units/kg subcutaneously times one dose, followed by 250 units/kg subcutaneously twice daily in addition to warfarin for at least 5 days until the INR is > 2 for 24 hours	• Baseline: Hgb/Hct, platelet count, and aPTT/PT • Therapeutic laboratory tests: aPTT to achieve specified target range per protocol for therapeutic doses • Inpatient: ◦ Hgb/Hct and platelet count 24 hours after starting heparin infusion, then every 2 days from days 4-14 unless heparin is stopped ◦ After day 14, Hgb/Hct and platelet count at least once weekly • Outpatient: ◦ New start: Platelet count at least once during the first 14 days of therapy regardless of prior exposure history ◦ Maintenance therapy: Hgb/Hct and platelet count every 3 months

Warfarin (Selected Vitamin K Antagonist) – For long-term management	
TREATMENT	**MONITORING[3,4]**
• Overlap warfarin (2.5-5 mg PO) with induction therapy (LMWH, Factor Xa Inhibitor, or subcutaneous UFH) beginning on Day 1 of therapy • Continue induction therapy until INR ≥ 2 for two days, AND patient has received at least 4-5 days of induction therapy overlap	• General INR goal: 2-3 • Mechanical aortic valve, INR goal: 2-3 • Mechanical mitral valve, INR goal: 2.5-3.5 • Baseline: Hgb/Hct, platelet count, PT/INR, and hepatic function tests • Therapeutic laboratory tests: INR to achieve specified target range • Inpatient: Hgb/Hct, platelet count, and INR at least once weekly • Outpatient: INR every 3 months at a minimum; Hgb/Hct, platelet count, serum creatinine, and hepatic function tests at least once year

[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
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APPENDIX E: Anticoagulation Therapy Options for Cancer Patients[1,2] - continued

Fondaparinux (Arixtra®) (Factor Xa Inhibitor)[3] – Fondaparinux dose subcutaneously daily			
ACTUAL BODY WEIGHT (kg)	**FONDAPARINUX DOSE**	**MONITORING[3,4]**	**DOSE ADJUSTMENTS**
< 50 50 – 100 > 100	5 mg 7.5 mg 10 mg	• Baseline: Hgb/Hct, platelet count, aPTT/PT, and serum creatinine • 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 thombosis) • Inpatient: Hgb/Hct, platelet count, and serum creatinine at least once weekly • Outpatient: Hgb/Hct, platelet count, serum creatinine, and hepatic function tests at least once yearly ◦ If CrCl 30-60 mL/minute, serum creatinine every 6 months ◦ If CrCl < 30 mL/minute, serum creatinine every 3 months	Renal: • If CrCl is between 30-50 mL/minute: use with caution • If CrCl is < 30 mL/minute: contraindicated Weight: • For BMI ≥ 40 kg/m^2: no dose adjustment necessary Platelets: • Use fondaparinux with caution in patients with platelets < 100 K/microliter

[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 (MD Anderson Institutional Policy #CLN0984)

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

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>
<tr><th>DOACs[1,2]</th><th colspan="2">Rivaroxaban (Xarelto®) Oral Factor Xa Inhibitor</th><th colspan="2">Apixaban (Eliquis®) Oral Factor Xa Inhibitor</th></tr>
<tr><td rowspan="3">Non-valvular atrial fibrillation (NVAF)
Not for any heart valve</td><td rowspan="2">CrCl > 50 mL/minute</td><td rowspan="2">20 mg once daily with food in evening</td><td>Age ≥ 80 years
Weight ≤ 60 kg
SCr ≥ 1.5 mg/dL</td><td>0-1 criterion: 5 mg twice daily
2-3 criteria: 2.5 mg twice daily</td></tr>
<tr><td>ESRD on HD</td><td>5 mg twice daily
If age ≥ 80 years or body weight ≤ 60 kg then 2.5 mg twice daily</td></tr>
<tr><td>CrCl ≤ 50 mL/minute</td><td>15 mg once daily with food in evening</td><td>Strong CYP 3A4 inhibitors (ketoconazole, itraconazole, ritonavir, clarithromycin) <u>and</u> P-gp inhibitors</td><td>Decrease current dose by 50%
[If on 2.5 mg twice daily then AVOID]</td></tr>
<tr><td>Use in liver disease</td><td colspan="2">CTP[3] class B or C: NOT recommended</td><td colspan="2">Use in CTP[3] class C not recommended and there is limited experience for use in class B</td></tr>
<tr><td>Significant drug-drug interactions[4]</td><td colspan="4">P-glycoprotein and CYP 3A4 interactions</td></tr>
<tr><td>Class specific contraindications</td><td colspan="4">Moderate to severe mitral stenosis or mechanical heart valve</td></tr>
<tr><td>Monitoring parameters</td><td colspan="2">• Baseline: Hgb/Hct, platelet count, aPTT/PT, SCr, and hepatic function tests
• 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 thombosis). Antifactor Xa levels are only available for apixaban and rivaroxaban currently.</td><td colspan="2">• Inpatient: Hgb/Hct, platelet count, and serum creatinine at least once weekly
• Outpatient: Hgb/Hct, platelet count, serum creatinine, and hepatic function tests at least once yearly
◦ If CrCl 30-60 mL/minute, serum creatinine every 6 months
◦ If CrCl < 30 mL/minute, serum creatinine every 3 months</td></tr>
</table>

CTP = Child-Turcotte-Pugh score; ESRD = end stage renal disease; HD = hemodialysis; 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] See Appendix J for Child-Turcotte-Pugh (CTP) Scoring System
[4] Assessing for drug-drug interactions: Lexicomp® or Micromedex®, available at insidemdanderson.org (for internal use only)

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>
<tr><th>DOACs[1,2]</th><th colspan="2">Edoxaban (Savaysa®)[3] Oral Factor Xa Inhibitor</th><th colspan="2">Dabigatran (Pradaxa®) Direct Thrombin Inhibitor</th></tr>
<tr><td rowspan="6">Non-valvular atrial fibrillation (NVAF)
Not for any heart valve</td><td rowspan="2">CrCl > 95 mL/minute
MUST assess CrCl before initiating</td><td rowspan="2">Avoid use</td><td>CrCl > 30 mL/minute</td><td>150 mg twice daily</td></tr>
<tr><td>CrCl 15-30 mL/minute</td><td>75 mg twice daily</td></tr>
<tr><td rowspan="2">CrCl > 50 mL/minute
to ≤ 95 mL/minute</td><td rowspan="2">60 mg daily</td><td>CrCl < 15 mL/minute <u>or</u> HD</td><td>No recommendations</td></tr>
<tr><td>CrCl 30-50 mL/minute <u>and</u> dronaderone or ketoconazole</td><td>75 mg twice daily</td></tr>
<tr><td>CrCl 15-50 mL/minute</td><td>30 mg daily</td><td rowspan="2">CrCl < 30 mL/minute <u>and</u> P-glycoprotein inhibitor (Pgp-I)</td><td rowspan="2">Avoid use</td></tr>
<tr><td>CrCl < 15 mL/minute</td><td>Avoid use</td></tr>
<tr><td>Use in liver disease</td><td colspan="2">CTP[4] class B or C: NOT recommended</td><td colspan="2">No recommendations by manufacturer</td></tr>
<tr><td>Class specific contraindications</td><td colspan="4">Moderate to severe mitral stenosis or mechanical heart valve</td></tr>
<tr><td>Significant drug-drug interactions[5]</td><td colspan="2">P-glycoprotein and CYP 3A4 interactions</td><td colspan="2">P-glycoprotein interactions</td></tr>
<tr><td>Monitoring parameters</td><td colspan="4">• Baseline: Hgb/Hct, 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 thombosis)
◦ Dabigatran: Thrombin time (TT) may be useful in certain high-risk patients (e.g., obesity, malnutrition, renal insufficiency, and unexplained bleeding or thombosis
• Inpatient: Hgb/Hct, platelet count, and serum creatinine at least once weekly
• Outpatient: Hgb/Hct, platelet count, serum creatinine, and hepatic function tests at least once yearly
◦ If CrCl 30-60 mL/minute, serum creatinine every 6 months
◦ If CrCl < 30 mL/minute, serum creatinine every 3 months</td></tr>
</table>

[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® or Micromedex®, available at insidemdanderson.org (for internal use only)

APPENDIX F: Special Considerations Regarding Drug Choice[1] for Rate Control

Clinical Condition	Drug of Choice[1]	Caution
Reactive airway disease (asthma, chronic obstructive pulmonary disease)	Calcium channel blockers	$Beta_1$ selective beta blockers may be used with caution
Hypertension and HF with normal left ventricular systolic function	Beta blockers or calcium channel blockers	
Left ventricular systolic dysfunction with or without HF	Beta blockers or digoxin	Beta blockers should be used with caution as not to decompensate. Calcium channel blockers are contraindicated.
No other cardiovascular disease	Beta blockers or calcium channel blockers	

APPENDIX G: Common Medication Dosage for Rate Control of AF/Atrial Flutter[2,3]

	Intravenous Administration	Usual Oral Maintenance Dose
Beta Blockers		
Metoprolol tartrate	2.5-5 mg IV bolus over 2 minutes; up to 3 doses	25-100 mg twice daily
Metoprolol succinate (XL)	N/A	50-400 mg once daily
Atenolol	N/A	25-100 mg once daily
Esmolol	500 mcg/kg IV bolus over 1 minute, then 50-300 mcg/kg/minute IV	N/A
Propranolol	1 mg IV over 1 minute, up to 3 doses at 2-minute intervals	10-40 mg three to four times a day
Nadolol	N/A	10-240 mg four times a day
Carvedilol	N/A	3.125-25 mg twice daily
Bisoprolol	N/A	2.5-10 mg once daily
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	180-480 mg once daily (extended release)
Diltiazem	0.25 mg/kg IV bolus over 2 minutes, then 5-15 mg/hour	120-360 mg once daily (extended release)
Digitalis Glycosides		
Digoxin	0.25 mg IV with repeat dosing to a maximum of 1.5 mg over 24 hours	0.125-0.25 mg once daily

[1] Obtain EKG for baseline pre-excitation
[2] Refer to Adult Cardiac Medication Monitoring Guidelines Policy (MD Anderson Institutional Policy # CLN0500)
[3] Not to be used if evidence of pre-excitation on EKG

APPENDIX H: Anticoagulation Recommendations for Patients on OAC for AF/Atrial Flutter needing PCI

Thrombosis Risk[1]	Bleeding Risk	OAC plus clopidogrel plus aspirin[2,3]	OAC plus clopidogrel	OAC only
In AF/atrial flutter patients requiring OAC undergoing elective PCI/stenting				
High	Low (HAS-BLED 0-2)	1-3 months	Until 12 months	Long term
High	High (HAS-BLED ≥ 3)	1 month	Until 6 months	Long term
Low	High (HAS-BLED ≥ 3)	None	Until 6 months	Long term
In AF/atrial flutter patients requiring OAC presenting with an ACS, undergoing PCI/stenting				
High	Low (HAS-BLED 0-2)	6 months	Until 12 months	Long term
High	High (HAS-BLED ≥ 3)	1-3 months	Until 12 months	Long term
Low	High (HAS-BLED ≥ 3)	None	Until 6-9 months	Long term

ACS = acute coronary syndrome
OAC = oral anticoagulant
PCI = percutaneous coronary intervention

[1] High thrombotic risk may include patients with left main stent, multivessel PCI/stenting, etc
[2] If a DOAC is chosen as the OAC do not use triple therapy. Doses should be based on those in Appendix E with the exception of rivaroxaban which should be used at a dose of 15 mg daily in combination with clopidogrel
[3] If aspirin is given with OAC, use aspirin 81 mg daily plus a proton pump inhibitor

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

APPENDIX I: Risk Score for Bleeding in patients with AF/Atrial Flutter[1]

Bleeding:

HAS-BLED Score

	Condition	Points
H	Hypertension	1
A	Abnormal liver or renal function (1 point each)	1
S	Stroke	1
B	Bleeding	1
L	Labile INR	1
E	Elderly (age greater than 65)	1
D	Drugs or alcohol (1 point each)	1

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

Chemical and Biochemical Parameters	Points for Increasing Abnormality		
	1	2	3
Hepatic encephalopathy	None	Grade 1 or 2, or suppressed with medication	Grade 3 or 4, or refractory to medication
Ascites	None	Mild to moderate (diuretic responsive)	Severe (diuretic refractory)
Serum albumin	> 3.5 g/dL	2.8-3.5 g/dL	< 2.8 g/dL
Total bilirubin For primary biliary cirrhosis	< 2 mg/dL 1-4 mg/dL	2-3 mg/dL 4-10 mg/dL	> 3 md/dL > 10 mg/dL
Prothrombin time prolonged or INR	< 4 seconds < 1.7	4-6 seconds 1.7-2.3	> 6 seconds > 2.3

*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

SUGGESTED READINGS

Delluc, A., Wang, T. F., Yap, E. S., Ay, C., Schaefer, J., Carrier, M., & Noble, S. (2019). Anticoagulation of cancer patients with non-valvular atrial fibrillation receiving chemotherapy: Guidance from the SSC of the ISTH. *Journal of Thrombosis and Haemostasis*, *17*(8), 1247–1252. https://doi.org/10.1111/jth.14478

Elmouchi, D. A., VanOosterhout, S., Muthusamy, P., Khan, M., Puetz, C., Davis, A. T., & Brown, M. D. (2014). Impact of an emergency department–initiated clinical protocol for the evaluation and treatment of atrial fibrillation. *Critical Pathways in Cardiology*, *13*(2), 43-48. https://doi.org/10.1097/HPC.0000000000000008

January, C. T., Wann, L. S., Calkins, H., Chen, L. Y., Cigarroa, J. E., Cleveland, J. C., . . . Yancy, C. W. (2019). 2019 AHA/ACC/HRS focused update of the 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Journal of the American College of Cardiology*, *74*(1), 104-132. https://doi.org/10.1016/j.jacc.2019.01.011

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DEVELOPMENT CREDITS

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:

Jean-Bernard Durand, MD (Cardiology)[Ŧ]
Wendy Garcia, BS[♦]
Vijaya Gottumukkala, MD (Anesthesiology & Perioperative Medicine)
Kaveh Karimzad, MD (Cardiology)[Ŧ]
Peter Kim, MD (Cardiology)
Michael Kroll, MD (Benign Hematology)[Ŧ]
Amy Pai, PharmD, BCPS[♦]
Carla Patel, MS, RN, ACNP (Thoracic & Cardiovascular Surgery)
Katy Toale, PharmD, BCPS (Pharmacy Quality-Regulatory)[Ŧ]
Ali Zalpour, PharmD (Pharmacy Clinical Programs)

[Ŧ] Core Development Team
[♦] Clinical Effectiveness Development Team