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ATRIAL FIBRILLATION
web: *elliotlakeeducation.com*

DR. Frank Chi

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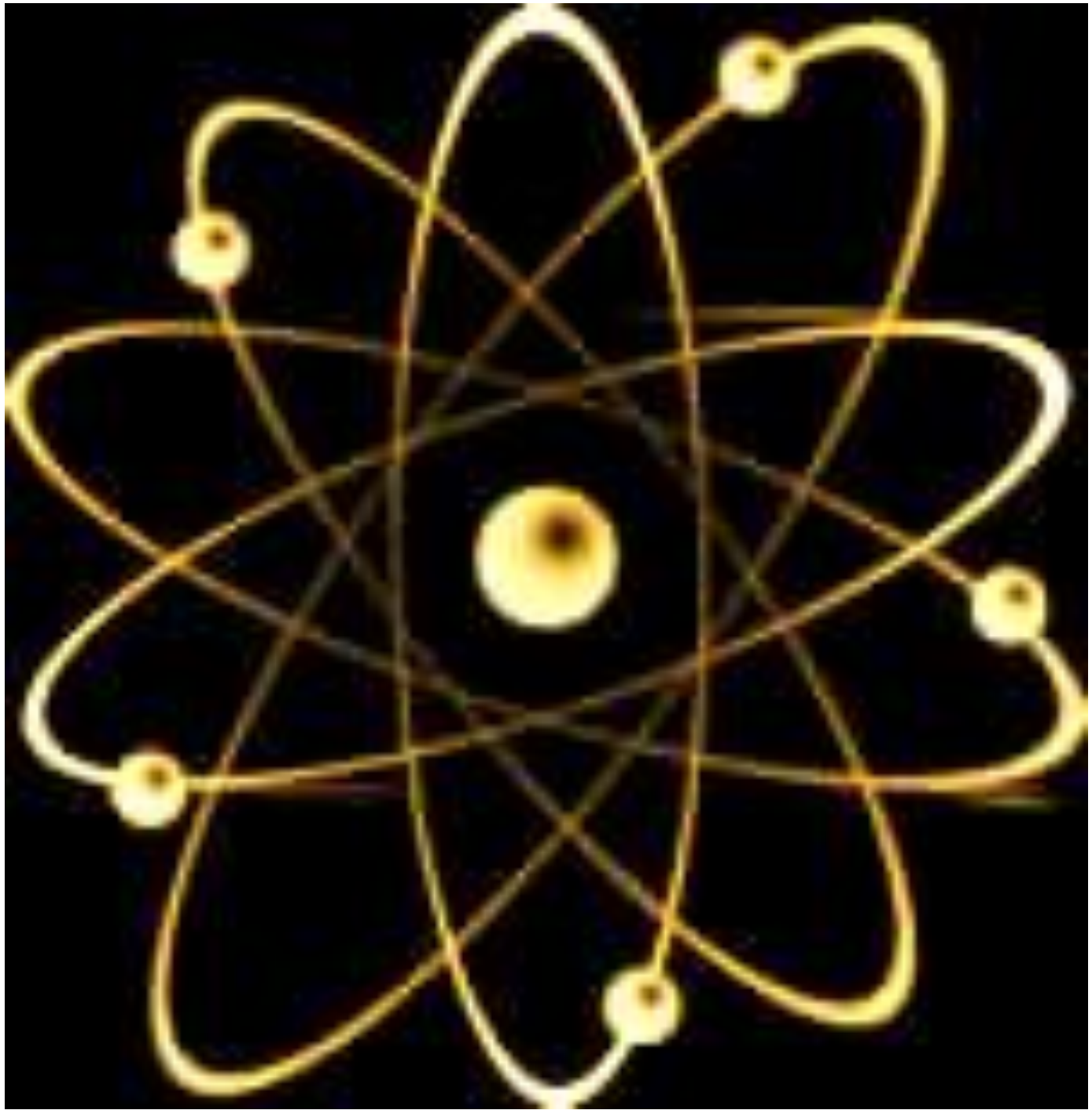


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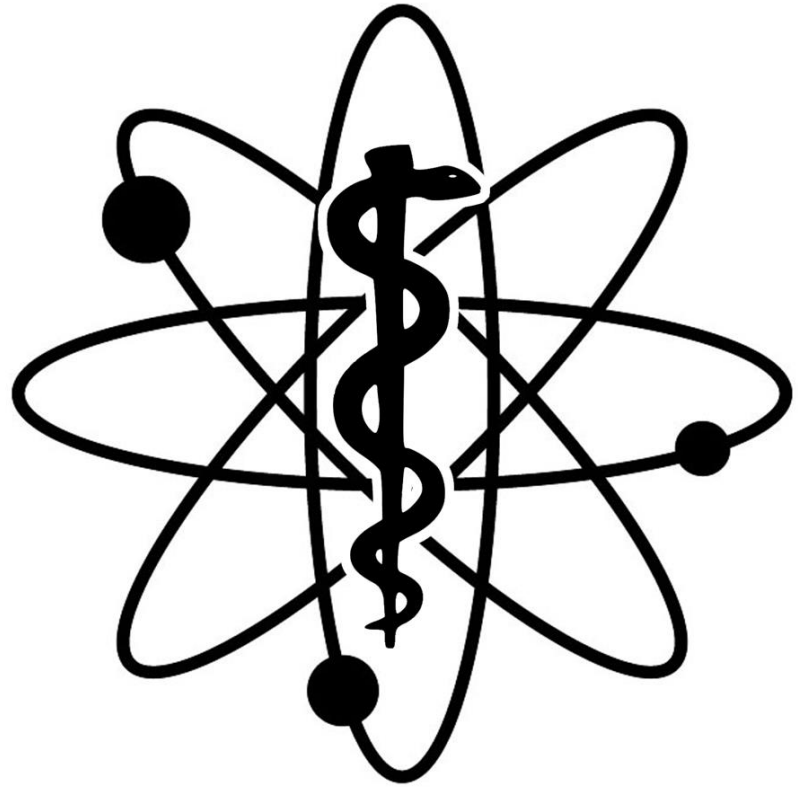

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- Atrial Fibrillation is the most common arrhythmia managed by emergency physicians. Atrial fibrillation is a global healthcare problem.
- Overall Prevalence of AF ~ 1%.
- 70% >=age 65, 45% >= age 80
- Estimated from ATRIA study 1997 2.3 million with AF in USA
- Incidence increases with advancing age
- 2050 prevalence 5.6 million

Artrial Fibrillation

1. No Conflict of Interest
2. No Commercial Bias

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ATRIAL FIBRILLATION

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Atrial Fibrillation

- Learning Objectives

- Residents will be able to:

1. In a patient who presents with new onset atrial fibrillation, look for an underlying cause (e.g., ischemic heart disease, acute myocardial infarction, congestive heart failure, cardiomyopathy, pulmonary embolus, hyperthyroidism, alcohol, etc.)
2. In a patient presenting with atrial fibrillation,
   a. Look for hemodynamic instability,
   b. Intervene rapidly and appropriately to stabilize the patient.
3. In an individual presenting with chronic or paroxysmal atrial fibrillation,
   a. Explore the need for anticoagulation based on the risk of stroke with the patient,
   b. Periodically reassess the need for anticoagulation.
4. In patients with atrial fibrillation, when the decision has been made to use anticoagulation, institute the appropriate therapy and patient education, with a comprehensive follow-up plan.
5. In a stable patient with atrial fibrillation, identify the need for rate control.
6. In a stable patient with atrial fibrillation, arrange for rhythm correction when appropriate

Atrial Fibrillation

- Definition

- Atrial fibrillation (AF) is a supraventricular tachyarrhythmia characterized by uncoordinated atrial activation with resulting deterioration of atrial mechanical function.

Classification

American Heart Association 2014

1. New-onset AF – Not previously documented
2. Paroxysmal (self terminating or intermittent) AF. Terminates spontaneously or with intervention within 7 days of onset.
3. Persistent AF Fails to self terminate within 7 days. Requires pharmacologic or electric cardioversion to restore sinus rhythm
4. Long-standing persistent AF- AF more than 12 months
5. Permanent AF- No longer pursue a rhythm control

Cardiac Causes of	ATRIAL FIBRILLATION
Common Cardiac Causes	Less Common Cardiac Causes
1. Hypertension (especially with associated left ventricular hypertrophy) 2. Ischemic heart disease 3. Rheumatic heart disease 4. Valvular heart disease (esp. mitral valve stenosis) 5. Cardiac surgery 6. Myocarditis 7. Sick sinus syndrome 8. Pre-excitation syndrome with accessory conduction pathways.(e.g. Wolff-Parkinson-White syndrome)	1. Dilated and hypertrophic cardiomyopathy 2. Pericardial disease (e.g. pericardial effusion , constrictive pericarditis) 3. Atrial septal defect 4. Atrial myxoma

Non-Cardiac Causes of Atrial Fibrillation

1. Hyperthyroidism
2. Acute Infections, esp. pneumonia in the elderly
3. Acute excess alcohol intake or chronic excess alcohol intake
4. Narcotic abuse
5. Obesity
6. Sleep apnea
7. Hemochromatosis
8. Sarcoidosis

Respiratory Causes

1. Lung cancer
2. COPD
3. Pleural effusion
4. Pulmonary embolism
5. Pulmonary hypertension

Symptoms

Identify the presence of the following symptoms:

A. Palpitations
B. Dyspnea
C. Dizziness, pre-syncope, or syncope
D. Chest pain
E. Weakness or fatigue

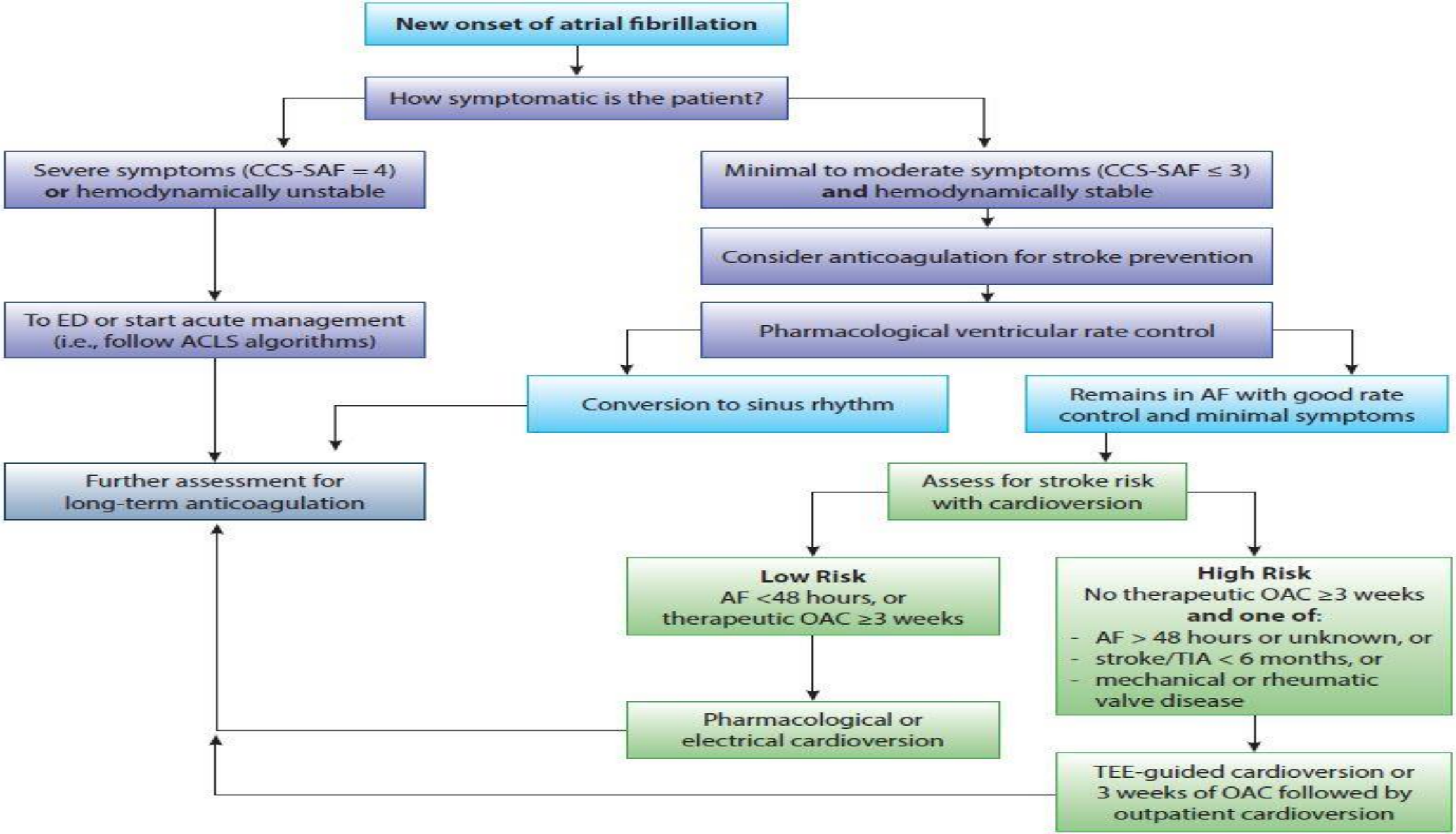
CCS-SAF Scale

Class	Definition
0	Asymptomatic with respect to AF
1	Minimal effect on pt.'s general quality of life. Single episode of AF without syncope or heart failure
2	Minor effect on pt.'s general quality of life. Rare episodes (less than a few per year)
3	Moderate effect on pt.'s general quality of life. More frequent episodes (more than every few months)
4	Severe effect on pt.'s general quality of life. Frequent or highly symptomatic episodes. Syncope and/or CHF secondary to AF

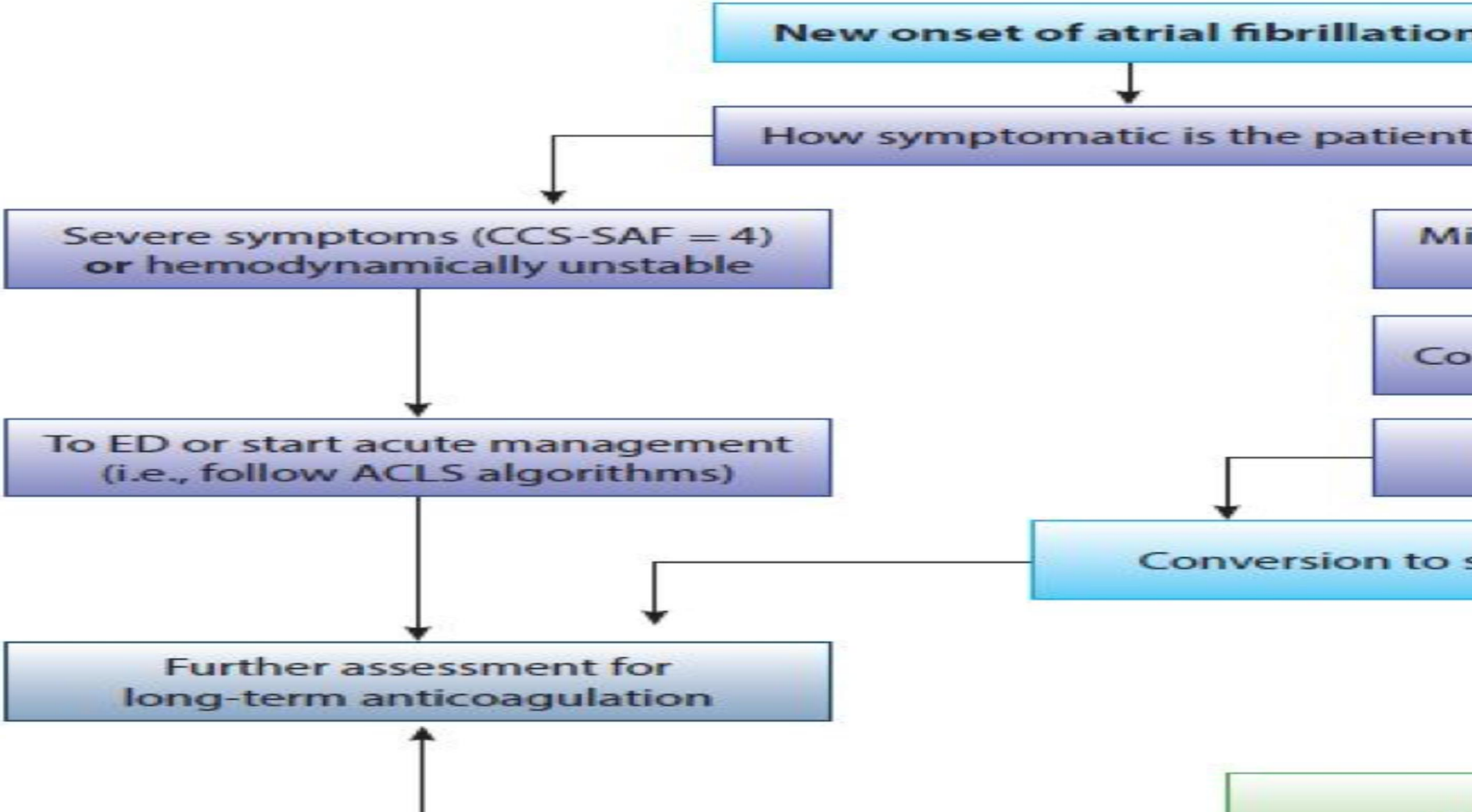
STEP 1

- How symptomatic is the Patient ?

  Class 0-4

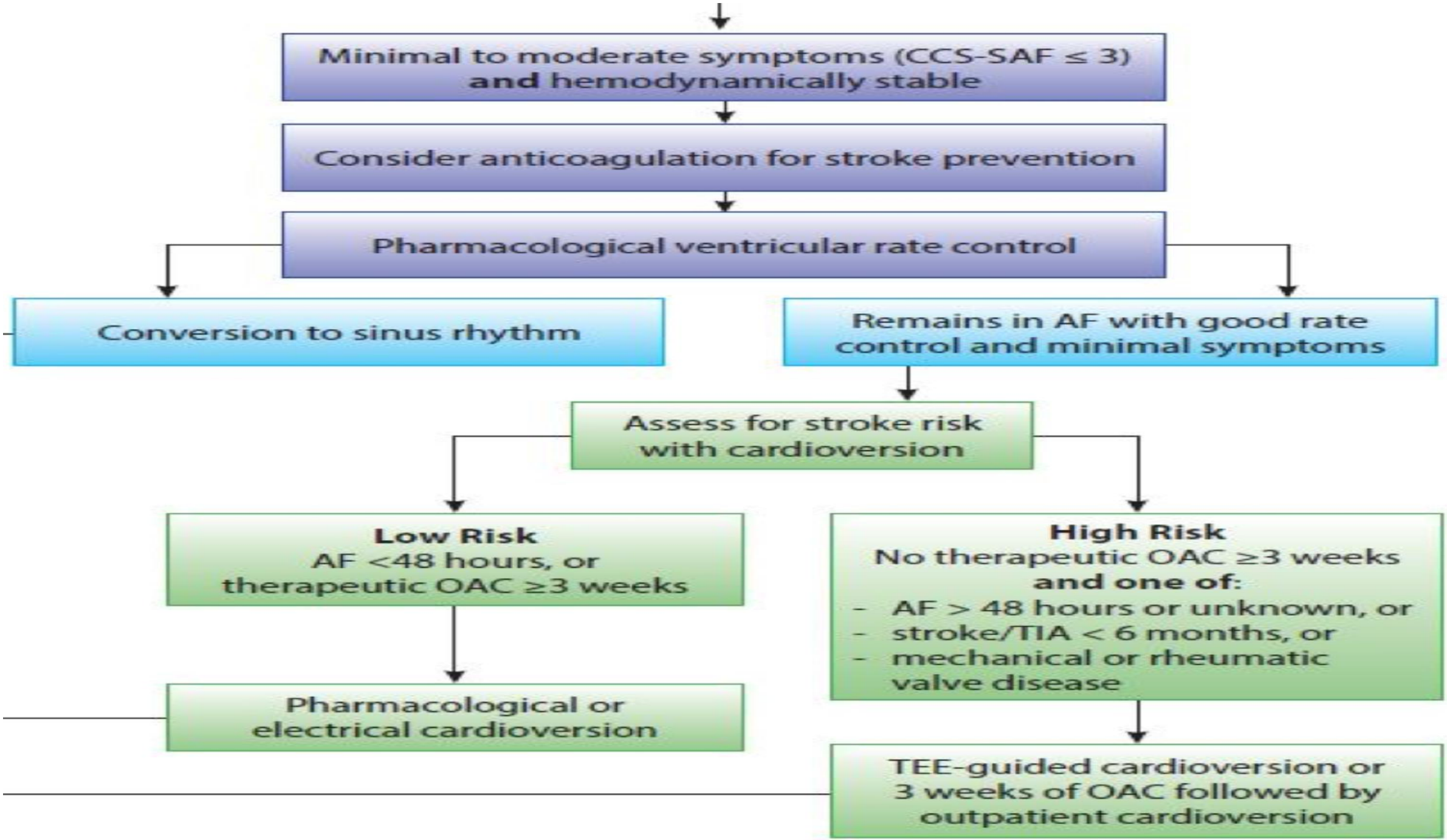


Abbreviations: ACLS = advanced cardiovascular life support; AF = atrial fibrillation; CCS-SAF = Canadian Cardiovascular Society Severity of Atrial Fibrillation score; ED = emergency department; OAC = oral anticoagulants; TEE = transesophageal echocardiography; TIA = transient ischemic attack.


New onset of atrial fibrillation
How symptomatic is the patient
Severe symptoms (CCS-SAF = 4)
or hemodynamically unstable
To ED or start acute management
(i.e., follow ACLS algorithms)
Further assessment for
long-term anticoagulation

Hemodynamically Unstable CCS-SAF 4

1. Immediate electrical cardioversion
2. Duration of AF < 48 hrs. No anticoagulation.
3. AF > 48 hours or high risk for stroke Administer IV unfractionated heparin or LMW heparin before cardioversion.
4. Bridge with heparin and start on course of oral anticoagulant for > 4 weeks post cardioversion.


Minimal to moderate symptoms (CCS-SAF ≤ 3) and hemodynamically stable
Consider anticoagulation for stroke prevention
Pharmacological ventricular rate control
Conversion to sinus rhythm
Remains in AF with good rate control and minimal symptoms
Assess for stroke risk with cardioversion
Low Risk
AF <48 hours, or therapeutic OAC ≥3 weeks
High Risk
No therapeutic OAC ≥3 weeks and one of:
- AF > 48 hours or unknown, or
- stroke/TIA < 6 months, or
- mechanical or rheumatic valve disease
Pharmacological or electrical cardioversion
TEE-guided cardioversion or 3 weeks of OAC followed by outpatient cardioversion

STEP 2

Should an Anticoagulant be used for Stroke Prevention?

STEP 2: Should an anticoagulant be used for stroke prevention?

2001

Letter	Clinical Characteristic	Score (if present)
C	Congestive heart failure	1
H	Hypertension	1
A	Age 75+	1
D	Diabetes	1
S	Prior Stroke or TIA	2
	Total CHADS2 Score	Maximum score = 6

CHADS2 Score	Approximate annual stroke risk without treatment (%)	Annual stroke risk with treatment (%)	
		ASA	Anticoagulants
0	1.9	1.3	1.0
1	2.8	2.0	1.4
2	4.0	2.8	2.0
3	5.9	4.1	3.0
4+	8.5 or more	6.0 or more	4.3 or more

Annual bleeding complications due to treatment based on CHADS2 score[a]

CHADS2 Score	Bleeding complication	Annual risk of bleeding complication (%)[c]	
		ASA	Anticoagulants
All scores	Major bleed (all types)	0.25	Up to 1.043
	Intracranial bleed	< 0.14	0.2 to 0.8

Bleeding Risks

HAS-BLED Score

Risk of major bleed 1.04%

Risk of stroke Chads =0	1.9%	Warfarin	1.0%
Risk of stroke Chads =1	2.8%	Warfarin	1.4%
Risk of stroke Chads=2	4.0%	Warfarin	2.0%
Risk of stroke Chads=3	5.9%	Warfarin	3.0%
Risk of stroke Chads=4+	8.5%+	Warfarin	4.3%+

2010 CHA2DS2-VASc Score

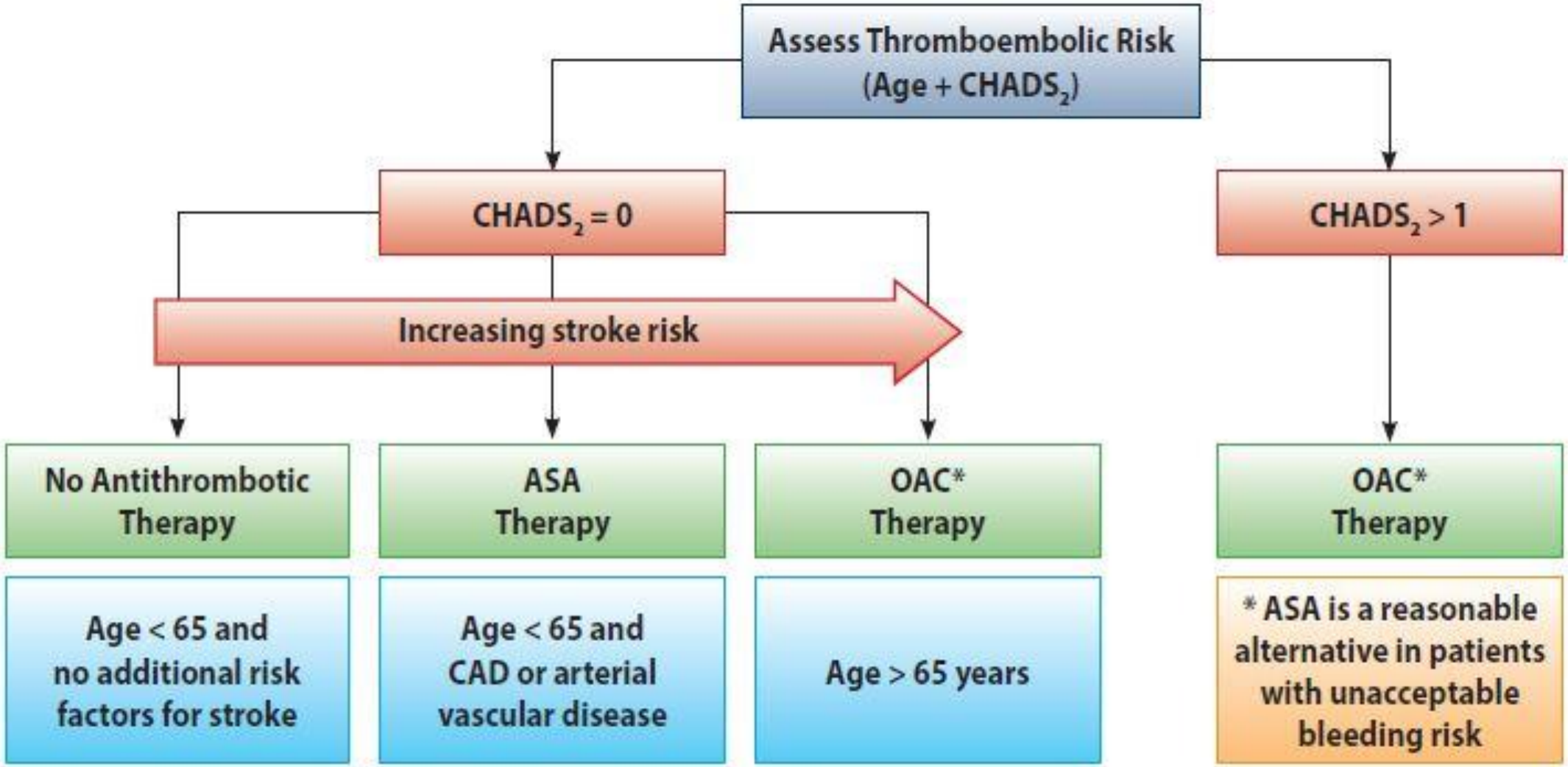
Risk Factors	C
Congestive Heart Failure/LV dysfunction	1
Hypertension	1
Age >= 75	2
Diabetes Mellitus	1
Stroke/ TIA / Thromboembolism	2
Vascular Disease (MI, PAD, Aortic Plaques)	1
Age 65-74	1
Sex Category (female gender)	1
Maximum Score	**9**

2014 CCS Guideline

Danish Cohort study BMJ 2011

Female sex 0.9%

Vascular Disease 1.4%



Abbreviations: ASA = acetyl-salicylic acid; CAD = coronary artery disease; OAC = oral anticoagulants.

All Studies based on OAC (Warfarin)

Should we use OAC (Warfarin) or NOAC

1. Dabigatran (*Pradaxa)* ?
2. Rivaroxaban (Xarelto) ?
3. Apixaban (Eliquis) ?
4. Edoxiban (Savasya) ?

Comparison of Anticoagulants for Atrial Fibrillation

Non- Vitamin K Antagonist Oral Anticoagulants (NOACs) versus warfarin for prevention of stroke or systemic embolism

Outcome	Dabigatran 119 mg BID	Dabigatran 150 mg BID	Rivaroxaban 20mg OD	Apixaban 5mg BID	
Stroke or systemic embolism prevention	=	<	=	<	
Major Bleeding	<	=	=	<	
Intracranial Bleeding	<	<	<	<	

OAC (warfarin) vs NOAC (non-vitamin K antagonist Oral Anticoagulants)

RE-LY, ROCKET,ARISTOTLE, ENGAGE

1. Non-inferior to warfarin for stroke or systemic embolization
2. None caused more major bleeding
3. All superior for intra-cranial hemorrhage

Organization	Recommenndations	Conditions
*Canadian Agency for Drugs and Technologies in Health (**CADTH**)*	**Warfarin over NOACs**	NOACs are as effective at preventing stroke as warfarin but are more expensive
*American Heart Association (**AHA**)* *American College of Cardiology (**ACC**)* *Heart Rhythm Society (**HRS**)*	**No recommendation of one over another**	Selection individualized on basis of risk factors, costs, tolerability, patient preference, potential for drug interactions.
*Canadian Cardiovascular Society (**CCS**)*	**NOACs over Warfarin for non-valvular AF**	Less marked preference in patients already receiving warfarin with stable therapeutic INRs. Patient preference
*European Cardiovascular Society (**ECS**)*	**NOACs over Warfarin for non-valvular AF**	NOACs non-inferior compared with warfarin with better safety re: intracranial hemorrhage

Advantages of Warfarin versus NOACs

WARFARIN	NOAC
1. Inexpensive 2. Reversal agents available 3. Extremes of body weight (<49 kg or >129 kg) 4. Pt. skipping doses (dementia) 5. Valvular Heart	1. Convenience 2. Able to skip lab testing 3. Poor venous access or lab access 4. Variable diet 5. History of intracranial bleed

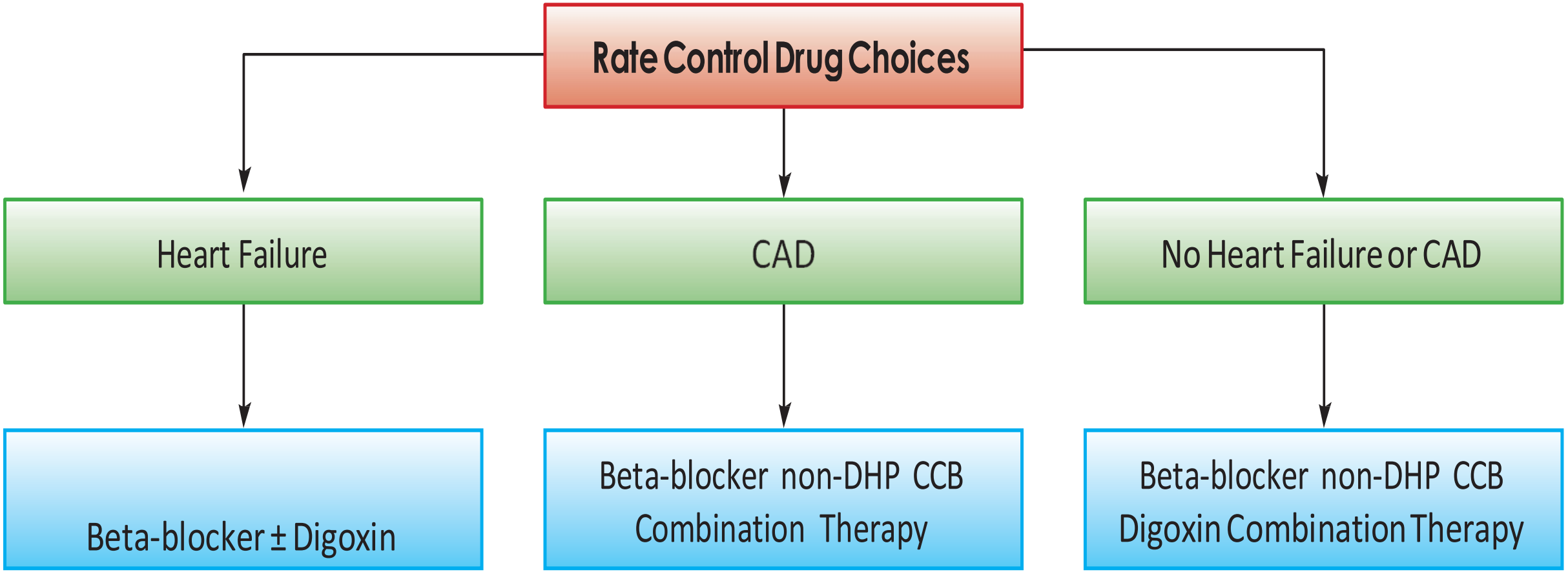
Generic Name	Trade name (dosage form and strength)	Adult dose	Cost per 30 days[a]	PharmaCare coverage[b]	Common and/or serious side effects	Therapeutic considerations
Oral anticoagulants						
Vitamin K Antagonists						
warfarin	Coumadin®, G (IR tablet: 1, 2, 2.5, 3, 4, 5, 6, 7.5, 10 mg	Initial: 2.5-10 mg PO daily, then individualize to maintain an INR of 2-3.	$2-10	Regular Coverage	Bleeding and skin necrosis	Contraindicated in pregnancy. Many potential interactions.
Direct Factor Xa Inhibitors						
dabigatran	Pradaxa® (IR capsule: 110, 150 mg)	150 mg PO BID or 110 mg PO BID for patients with ≥ 1 of the following: - age ≥ 75 years - CrCl 30-50 mL/min - concurrent use of strong P-gp inhibitor or antiplatelet agent - previous GI bleed	$104	Limited Coverage[c] Special Authority	Bleeding and GI intolerance	Contraindicated in combination with strong inhibitors of P-gp. Use cautiously with other drugs acting on P-gp. No reversal agents available.
Direct Thrombin Inhibitors						
rivaroxaban	Xarelto® (IR tablet: 10, 15, 20 mg)	20 mg PO daily with food or 15 mg PO daily with food for patients with CrCl 30-49 mL/min	$92	Limited Coverage[c] Special Authority	Bleeding	Contraindicated in combination with strong inhibitors of both CYP3A4 and P-gp. No reversal agents available.
apixaban	Eliquis® (IR tablet: 2.5, 5 mg)	5 mg PO BID or 2.5 mg PO BID for patients with ≥ 2 of the following: - age ≥ 80 years - body weight ≤ 60 kg - serum creatinine ≥ 133 µmol/L	$104	Limited Coverage[c] Special Authority	Bleeding	Contraindicated in combination with strong inhibitors of both CYP3A4 and P-gp. No reversal agents available.

Step 3
Rate or Rhythm Control?

Favours Rate Control	*Favours Rhythm Control*
• Persistent AF • Less symptomatic • Aged ≥ 65 years • Hypertension • No history of CHF • Previous antiarrhythmic drug failure • Patient preference • High stroke risk with cardioversion	• Paroxysmal AF • Newly detected AF • More symptomatic • Aged < 65 years • No hypertension • HF clearly exacerbated by AF • No previous antiarrhythmic drug failure • Patient preference • Low stroke risk with cardioversion

Abbreviations: AF = atrial fibrillation; CHF = congestive heart failure; HF = heart failure.
Adapted from: Gillis AM, et al. Canadian Cardiovascular Society Atrial Fibrillation Guidelines 2010: Rate and Rhythm Management, Canadian Journal of Cardiology 2011;27:47-59.

Rate Control Therapy



Drugs for Rate Control Beta Blockers

atenolol	Tenormin®, G (IR tablet: 25, 50, 100 mg)	**IR tablet**: 50-150 mg PO once daily. Reduce dose by 25-50% if used concurrently with digoxin, calcium channel blockers, or amiodarone.	$5-13 (G)	Regular Coverage	Bradycardia, hypotension, dyspnea, fatigue, and depression	Use with caution in patients with diabetes, heart failure, or bronchospastic lung disease. Beta1-selective. Less likely to cause depression.
bisoprolol	G (IR tablet: 5, 10 mg)	**IR tablet**: 5-20 mg PO once daily. Reduce dose by 25-50% if used concurrently with digoxin, calcium channel blockers, or amiodarone.	$1-17 (G)	Regular Coverage	Bradycardia, hypotension, dyspnea, fatigue, and depression	Use with caution in patients with diabetes, heart failure, or bronchospastic lung disease. Beta1-selective.
metoprolol	Betaloc®, Lopresor®, G (IV injection: 1 mg/mL; IR tablet: 25, 50, 100 mg; SR tablet: 100, 200 mg)	**IV injection**: 5-10 mg q5 min x 3 doses. **IR tablet**: 50-200 mg PO BID. **SR tablet**: 100-400 mg PO once daily. Reduce dose by 25-50% if used concurrently with digoxin, calcium channel blockers, or amiodarone.	IR tablet: $4-17 (G) SR tablet: $4-17 (G)	Regular Coverage	Bradycardia, hypotension, dyspnea, fatigue, and depression	Use with caution in patients with diabetes, heart failure, or bronchospastic lung disease. Beta1-selective.

Drugs for Rate Control Beta Blockers

nadolol	Nadolol, G (IR tablet: 40, 80, 160 mg)	20-160 mg PO once daily. Reduce dose by 25-50% if used concurrently with digoxin, calcium channel blockers, or amiodarone.	$8-39 (G)	Regular Coverage	Bradycardia, hypotension, dyspnea, fatigue, and depression	Use with caution in patients with diabetes, heart failure, or bronchospastic lung disease. Less likely to cause depression.
propranolol	Inderal®, G (IV injection: 1 mg/mL; IR tablet: 10, 20, 40, 80, 120 mg; SR capsule: 60, 80, 120, 160 mg)	**IV injection**: 1-3 mg q2 minutes x 2 doses. May repeat in 4 hours. **IR tablet**: 20-80 mg PO TID. **SR capsule:** 80-240 mg PO once daily. Reduce dose by 25-50% if used concurrently with digoxin, calcium channel blockers, or amiodarone.	IR tablet: $9-14 (G) SR tablet: $21-64	Regular Coverage (IR tablet: 10, 20, 40, 80 mg; SR capsule: 60, 80, 120, 160 mg No Coverage (IR tablet: 120 mg)	Bradycardia, hypotension, dyspnea, fatigue, and depression	Use with caution in patients with diabetes, heart failure, or bronchospastic lung disease. SR dosage forms preferred to prolong the dosing interval and improve patient compliance.

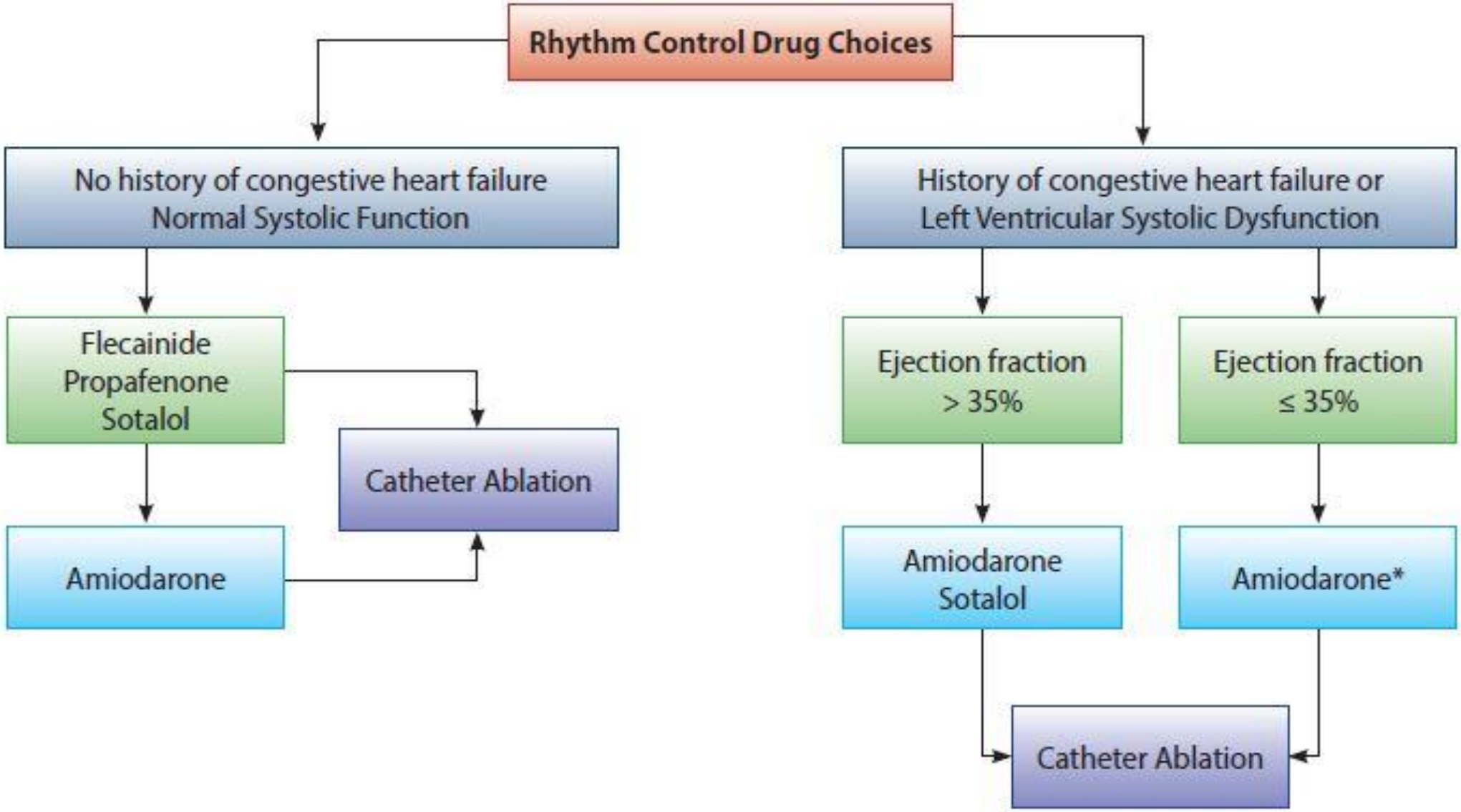
Drugs for Rate Control Calcium Channel Blocker Non Dihydropyridine

verapamil	Isoptin®, G (IV injection: 2.5 mg/mL; IR tablet: 80, 120 mg; SR tablet: 120, 180, 240 mg)	**IV injection**: 5-10 mg. May give an extra 10 mg in 30 minutes. **Starting dose**: 120 mg/day PO. **Maximum dose**: 480 mg/day PO. **IR tablet** given in divided doses TID – QID. **SR tablet** given once daily or in divided doses BID.	IR tablet: $14-55 (G) SR tablet: $17-33 (G)	Regular Coverage	Bradycardia, hypotension, constipation, and flushing	Use with caution in patients with heart failure. SR dosage generally preferred to prolong the dosing interval and improve patient compliance.
diltiazem	Cardizem®, G (IV injection: 5 mg/mL; IR tablet: 30, 60 mg; ER capsule: 120, 180, 240, 300 mg) Tiazac®, G	0.25 mg/kg. May give another 0.25 mg/kg after 15 minutes if needed. 180-540 mg/day PO. **IR tablet** given in divided doses TID – QID. **ER capsule**: 120-540 mg PO once daily.	IR tablet: $32-99 (G) ER capsule: $7-46 (G)	Regular Coverage	Bradycardia, hypotension, and ankle swelling	Use with caution in patients with heart failure. SR dosage generally preferred to prolong the dosing interval and improve patient compliance.

Drugs for Rate Control Digitalis

digoxin	Toloxin®, G (IV injection: 50, 250 µg/mL; IR tablet: 0.0625, 0.125, 0.25)	**Loading**: 1-1.5 mg in divided doses PO or IV. **Maintenance**: 0.125-0.375 mg PO daily. Reduce dose by 25-50% if used concurrently with beta- blockers, calcium channel blockers, or quinidine.	IR tablet: $8-16	Regular Coverage	Bradycardia, nausea, vomiting, visual disturbances, and proarrhthmogenic	Only in patients with AF due to heart failure. Check serum and potassium levels. Correct hypokalemia if present.

Rhythm Control



Footnote: * In patients with left ventricular ejection fraction ≤ 35% amiodarone is the only drug recommended because of the low risk of proarrhythmia in heart failure.[28,29] Amiodarone or sotalol are recommended in those with ejection fraction > 35%.[17]

Drugs for Rhythm Control Class 1C Antiarrhythmic

flecainide	Tambocor®, G (IR tablet: 50, 100 mg)	**Starting dose**: 50 mg PO q12h. Reduce by 50% in patients with renal dysfunction. **Titration**: increase by 50 mg increments based on QRS intervals. Reduce dose if QRS increases >20% from baseline. **Maximum dose**: 200 mg q12h PO.	$26-104 (G)	Regular Coverage	Ventricular proarrhythmia, tremor, blurred vision, and heart failure	Should be used concurrently with a beta-blocker or nondihyropyridine calcium channel blocker. Do not use in patients with coronary artery or structural heart disease. Metabolized by CYP2D6, resulting in many potential drug interactions.

Drugs for Rhythm Control Class 1C Antiarrhythmic

propafenone	Rythmol®, G (IR tablet: 150, 300 mg)	150 – 300 mg PO q8h. Reduce initial dose by 50% and increase dosing interval to q12h in patients with renal or hepatic dysfunction.	$29-51 (G)	Regular Coverage	Constipation, headache, metallic taste, and ventricular proarrhythmia	Should be used concurrently with a beta-blocker or nondihyropyridine calcium channel blocker. Do not use in patients with coronary artery or structural heart disease. Reduce dose of concurrently administered digoxin by 25-50%. Metabolized by CYP2D6, resulting in many potential drug interactions. Monitor QRS duration carefully as active metabolites accumulate in rapid metabolizers.

Drugs for Rhythm Control Class III Antiarrhythmics

amiodarone	Cardarone®, G (IV: 50 mg/ml; IR tablet: 100, 200 mg)	200 mg PO TID x 2 weeks, then 200-400 mg once daily PO. **IV loading**: 150 mg IV over 10 minutes, followed by 1.2- 1.8 g/day to a total of 10 g Loading doses may vary.	$17-33 (G)	Regular Coverage	Various GI, dermatologic, neurologic, ophthalmologic, ventricular proarrhythmia and thyroid abnormalities Rare, but potentially life-threatening pulmonary fibrosis, hepatic dysfunction, and aggravation of arrhythmias	Monitor transaminases and thyroid function every 6 months. Reduce dose of concurrently used beta-blockers, procainamide, quinidine, and warfarin by 50%.
dronedarone	Multaq® (IR tablet: 400 mg)	400 mg PO BID.	$139	Limited Coverage Special Authority	Diarrhea, dyspepsia, nausea, and hepatic dysfunction (rare) Slight increase in plasma creatinine related to inhibition of secretion	Contraindicated in patients with severe heart failure (NYHA class IV). Contraindicated in patients using strong CYP3A4 inhibitors. Use with caution with drugs metabolized by CYP3A4. Not recommended in patients with permanent AF.
sotalol	Sotalol, G (IR tablet: 80, 160, 240 mg)	**Starting dose**: 80 mg PO q12h. **Titration**: increase by 80 mg increments if QTc <460 ms. Reduce dose if QTc ≥500 ms. **Maximum**: 240 mg PO q12h. **Elderly**: reduce initial dose to 40 mg PO q12h. **Renal dysfunction**: reduce initial dose in renal failure.	$19-30 (G)	Regular Coverage (IR tablet: 80, 160 mg) No Coverage (IR tablet: 240 mg)	Hypotension, bradycardia, wheezing, ventricular proarrhythmia Torsades de pointes, especially at higher doses or with renal dysfunction	Concurrent use with digoxin, diltiazem, verapamil, or other beta-blockers may cause AV block and bradycardia. Use with caution in patients with risk for QT prolongation or torsades de pointes.

Indications for Referral

- Cardiology or Internal Medicine:
  - A review by a specialist can be considered for patient eligibility for long-term
  - OAC or for an alternative treatment if the patient has a contraindication to
  - anticoagulants.
  - Consider referral if poor or incomplete response, or ongoing symptoms.
- Neurology or Internal Medicine:
  - Recurrent TIA/minor stroke.
- Specialty Clinics:
  - AF clinics.
  - Management of co-morbid conditions (e.g., diabetes clinics, heart failure clinics).

Case 1

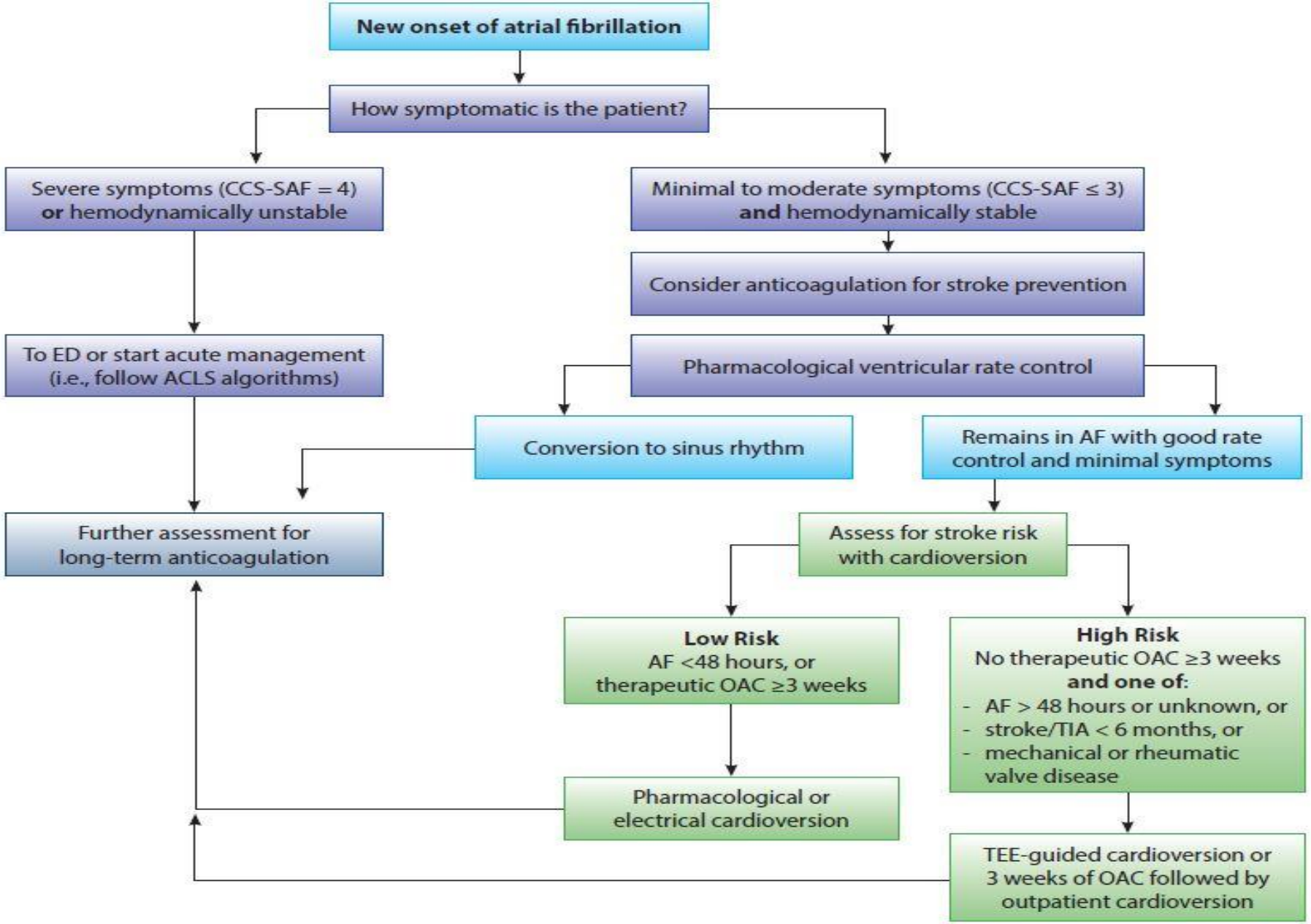
60-year-old male presents to ER with atrial fibrillation. His blood pressure is 70/30 with a heart rate of 140 irregularly, irregular. He is short of breath and has chest pains. He is on no medication and has been healthy.

Case 1

Step 1 How symptomatic is patient

- Hemodynamically unstable
- CCS-SAF Class 4

Case 1



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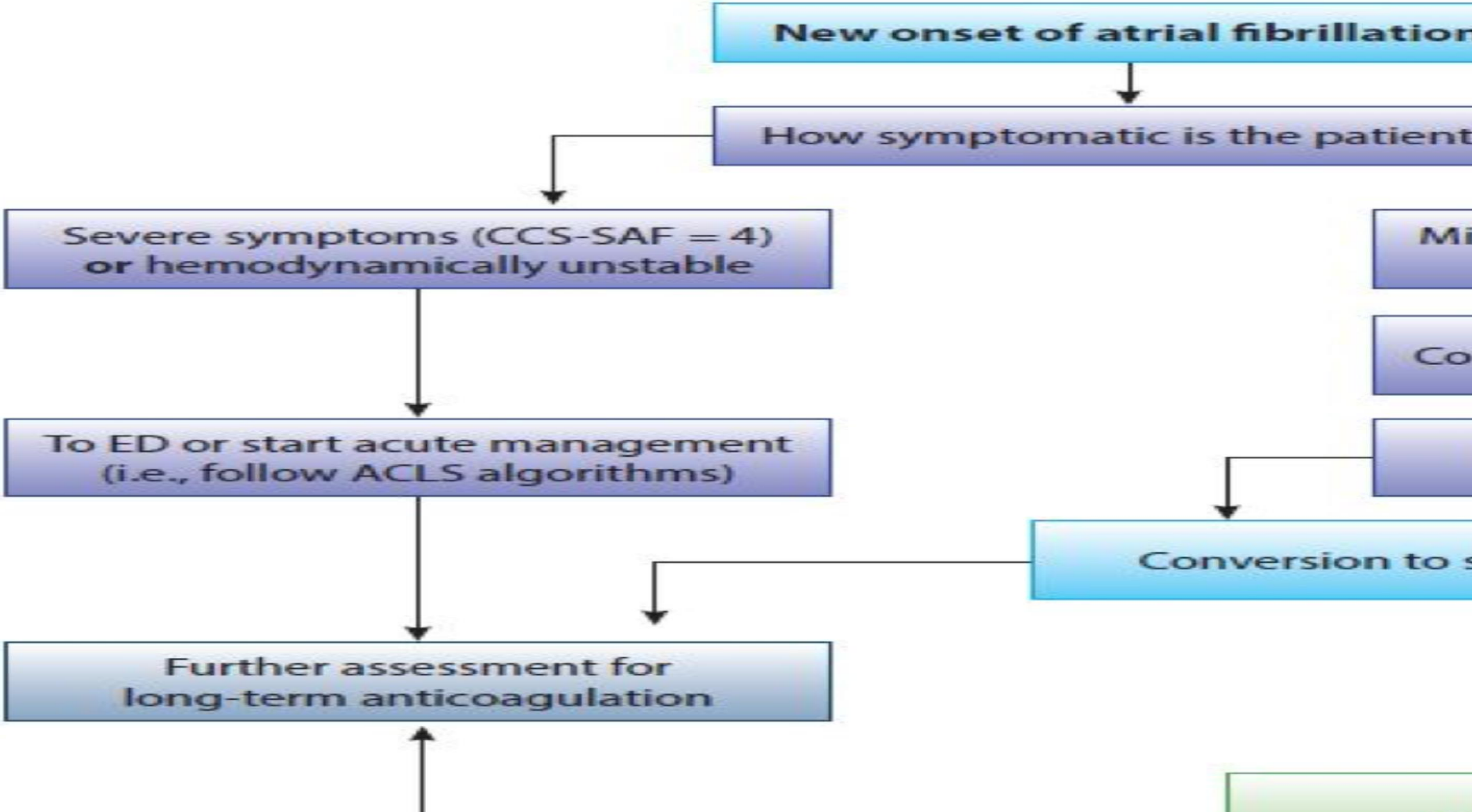

New onset of atrial fibrillation
How symptomatic is the patient
Severe symptoms (CCS-SAF = 4)
or hemodynamically unstable
To ED or start acute management
(i.e., follow ACLS algorithms)
Further assessment for
long-term anticoagulation

Case 1

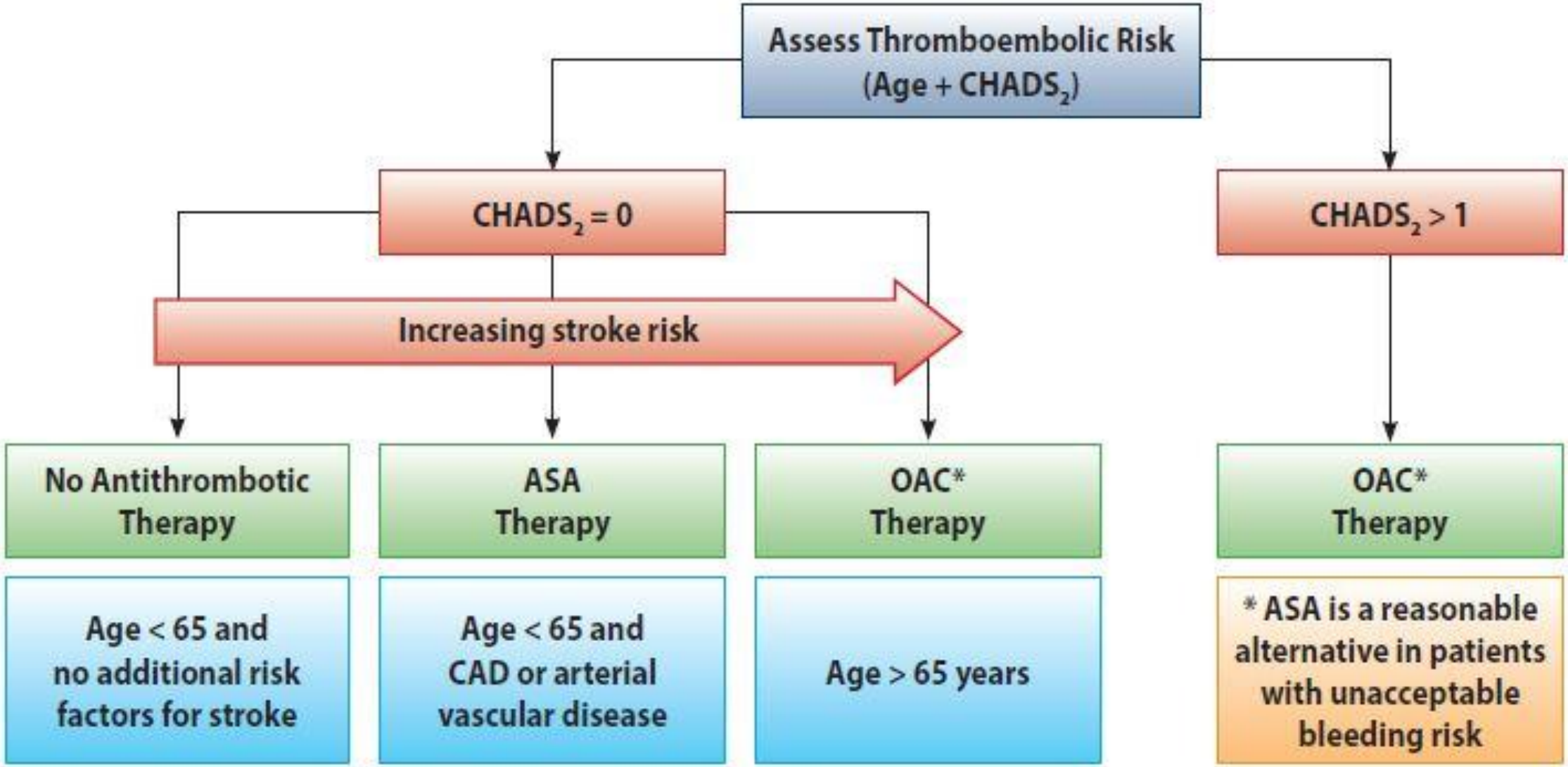
Uncommon Presentation

1. Immediate electrical cardioversion
2. Duration of AF < 48 hrs. No anticoagulation.
3. AF > 48 hours or high risk for stroke Administer IV unfractionated heparin or LMW heparin before cardioversion.
4. Bridge with heparin and start on course of oral anticoagulant for > 4 weeks post cardioversion.

Case 1

Step 2 Should an anticoagulant be used for stroke Prevention?

1. Short term
2. Long term



Abbreviations: ASA = acetyl-salicylic acid; CAD = coronary artery disease; OAC = oral anticoagulants.

Step 3 Rate or Rhythm Control?

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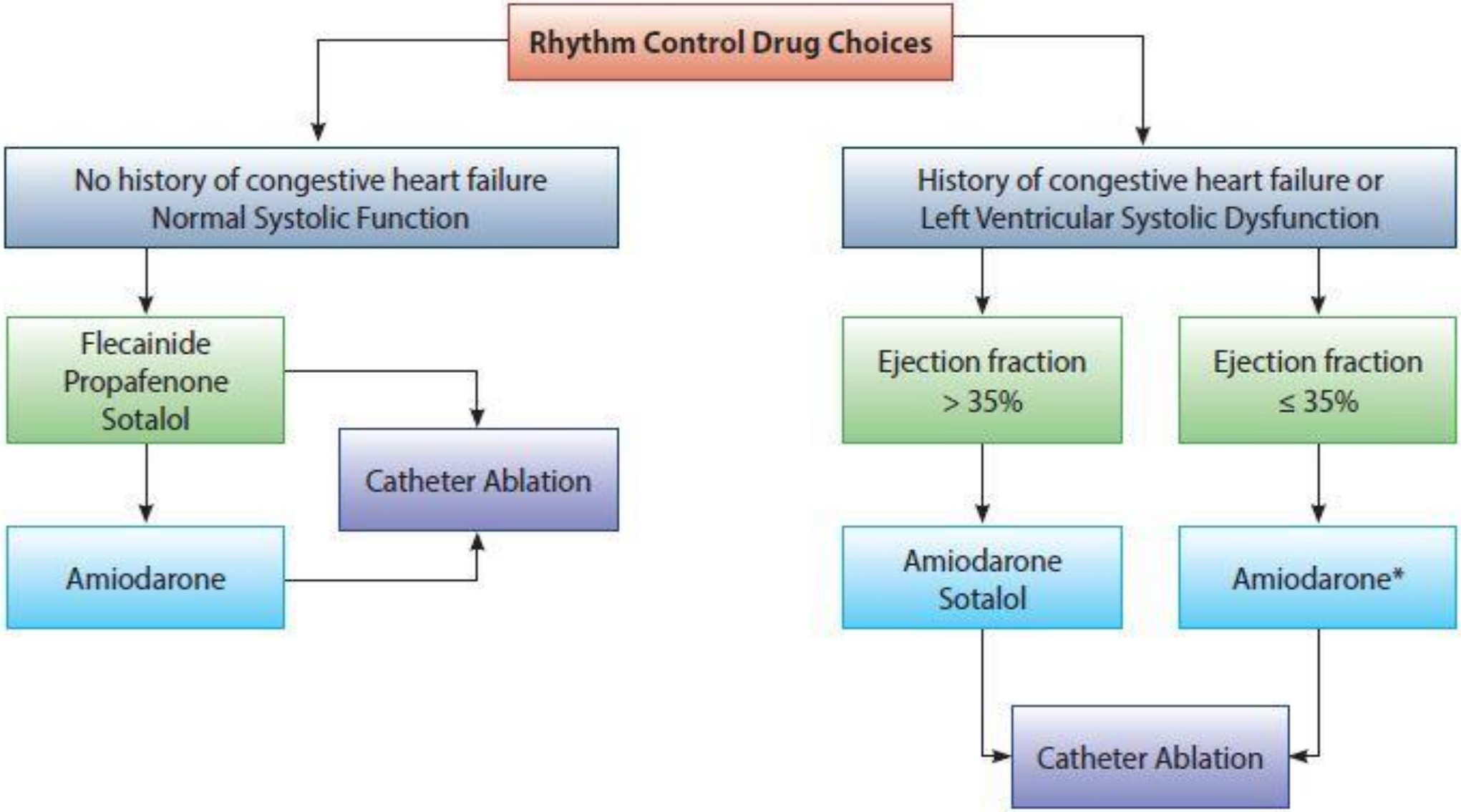
Rhythm Control



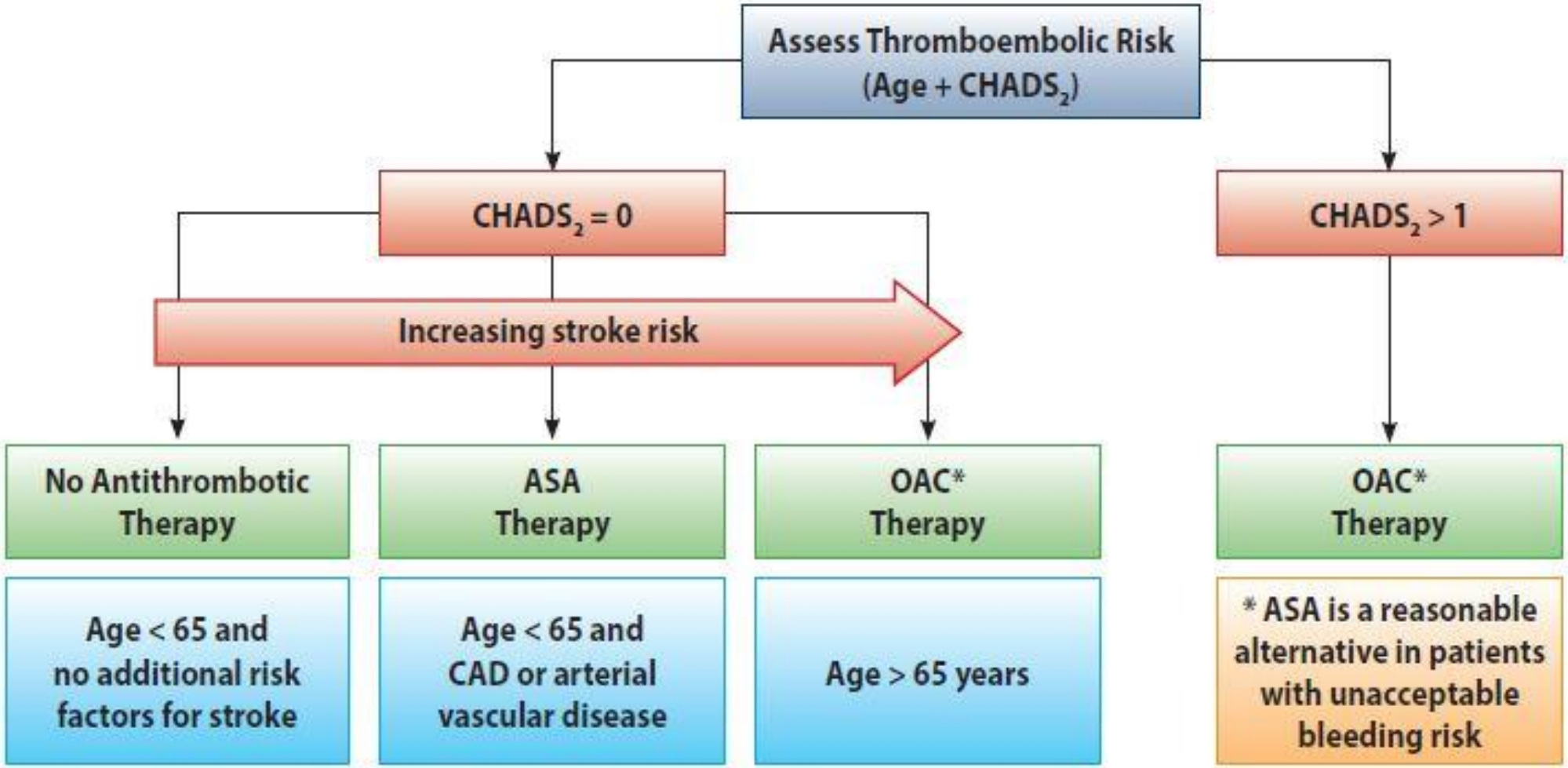
Footnote: * In patients with left ventricular ejection fraction ≤ 35% amiodarone is the only drug recommended because of the low risk of proarrhythmia in heart failure.[28,29] Amiodarone or sotalol are recommended in those with ejection fraction > 35%.[17]

Case 1

What if?

1. 65-year-old
2. Diabetes, Hypertension, etc.
3. Previous MI

Letter	Clinical Characteristic	Score (if present)
C	Congestive heart failure	1
H	Hypertension	1
A	Age 75+	1
D	Diabetes	1
S	Prior Stroke or TIA	2
	Total CHADS2 Score	Maximum score = 6



Abbreviations: ASA = acetyl-salicylic acid; CAD = coronary artery disease; OAC = oral anticoagulants.

Case 2

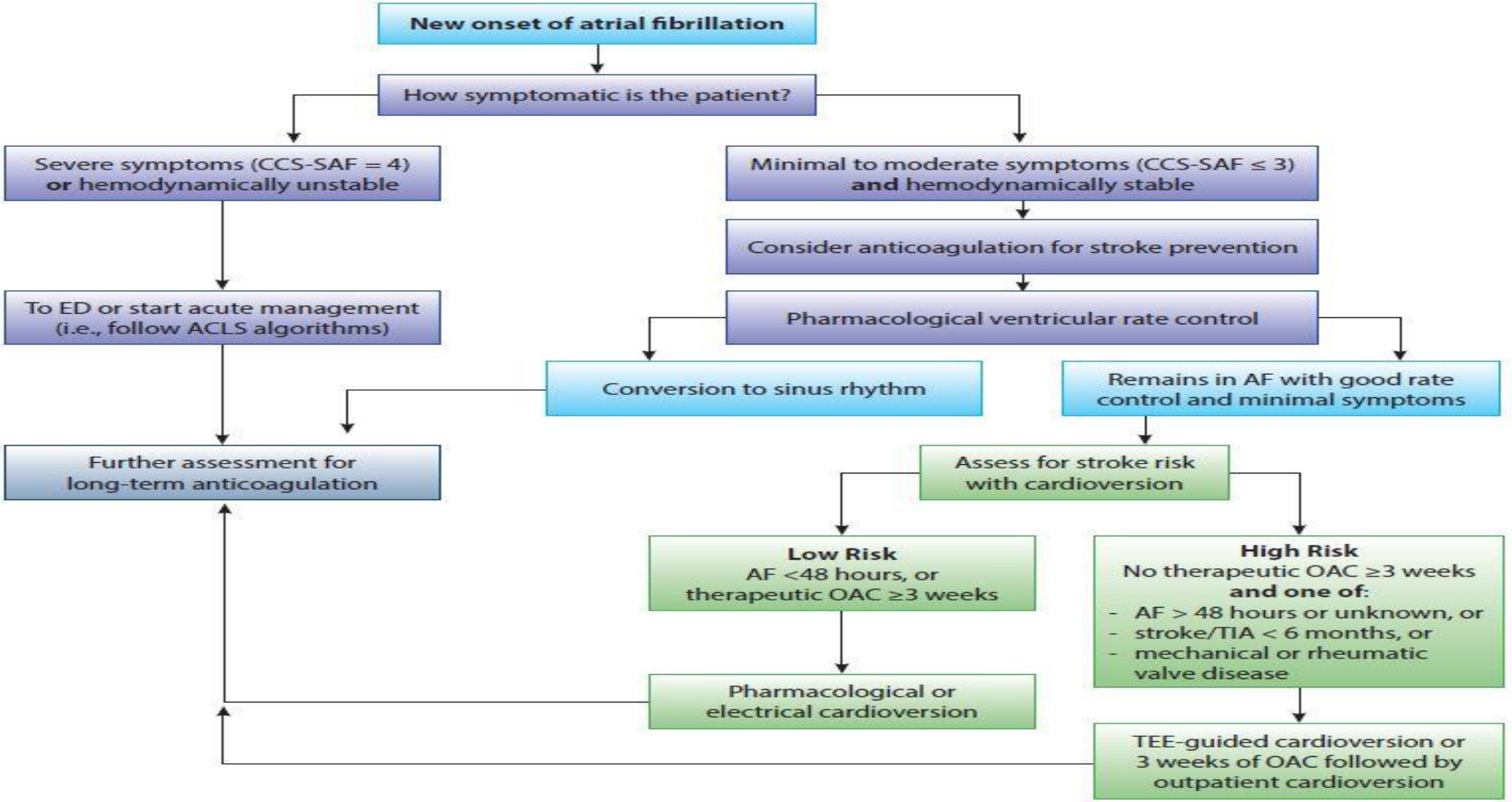
75-year-old male with a history of NIDDM, hypertension and PVD, presents with a 3-day history of feeling unwell , palpitations and short of breath going up a flight of stairs. His blood pressure is 100/50, heart rate of 120/min.

Case 2

Step 1

How symptomatic?

Class 2 CCS-SAF (Minor to Moderate)



Abbreviations: ACLS = advanced cardiovascular life support; AF = atrial fibrillation; CCS-SAF = Canadian Cardiovascular Society Severity of Atrial Fibrillation score; ED = emergency department; OAC = oral anticoagulants; TEE = transesophageal echocardiography; TIA = transient ischemic attack.

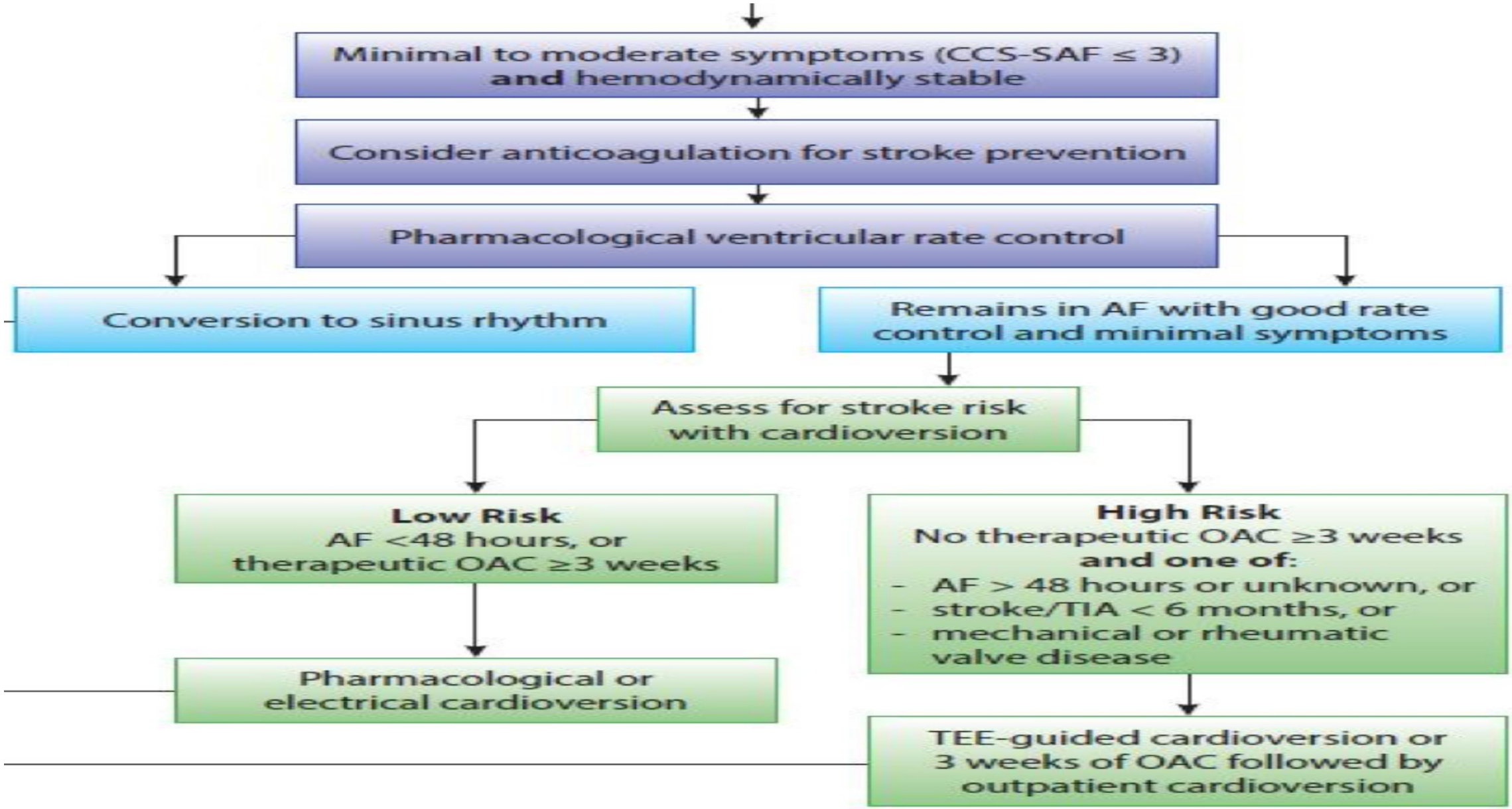
Case 2

Step 2

Should an Anticoagulant be used for Stroke Prevention?

1. Short term
2. Long Term

Case 2 Short term Anticoagulant



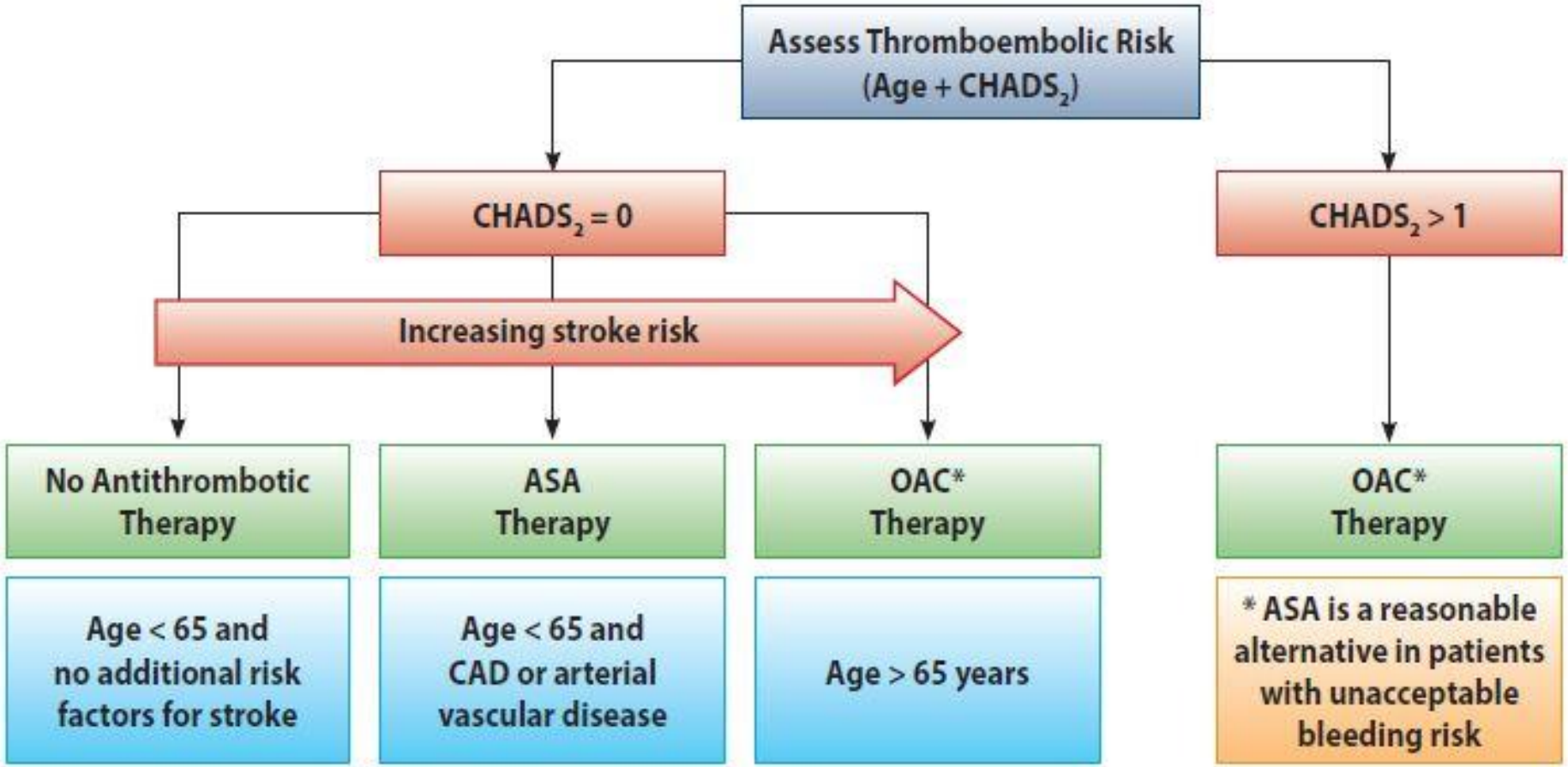
75 year old , Diabetes, Hypertension, Vascular disease

Letter	Clinical Characteristic	Score (if present)
C	Congestive heart failure	1
H	Hypertension	1
A	Age 75+	1
D	Diabetes	1
S	Prior Stroke or TIA	2
	Total $CHADS_2$ Score	Maximum score = 6

Chads score = 3

CHADS2 Score	Approximate annual stroke risk without treatment (%)	Annual stroke risk with treatment (%)	
		ASA	Anticoagulantsb
0	1.9	1.3	1.0
1	2.8	2.0	1.4
2	4.0	2.8	2.0
3	5.9	4.1	3.0
4+	8.5 or more	6.0 or more	4.3 or more

Vascular Disease, CHADS = 3



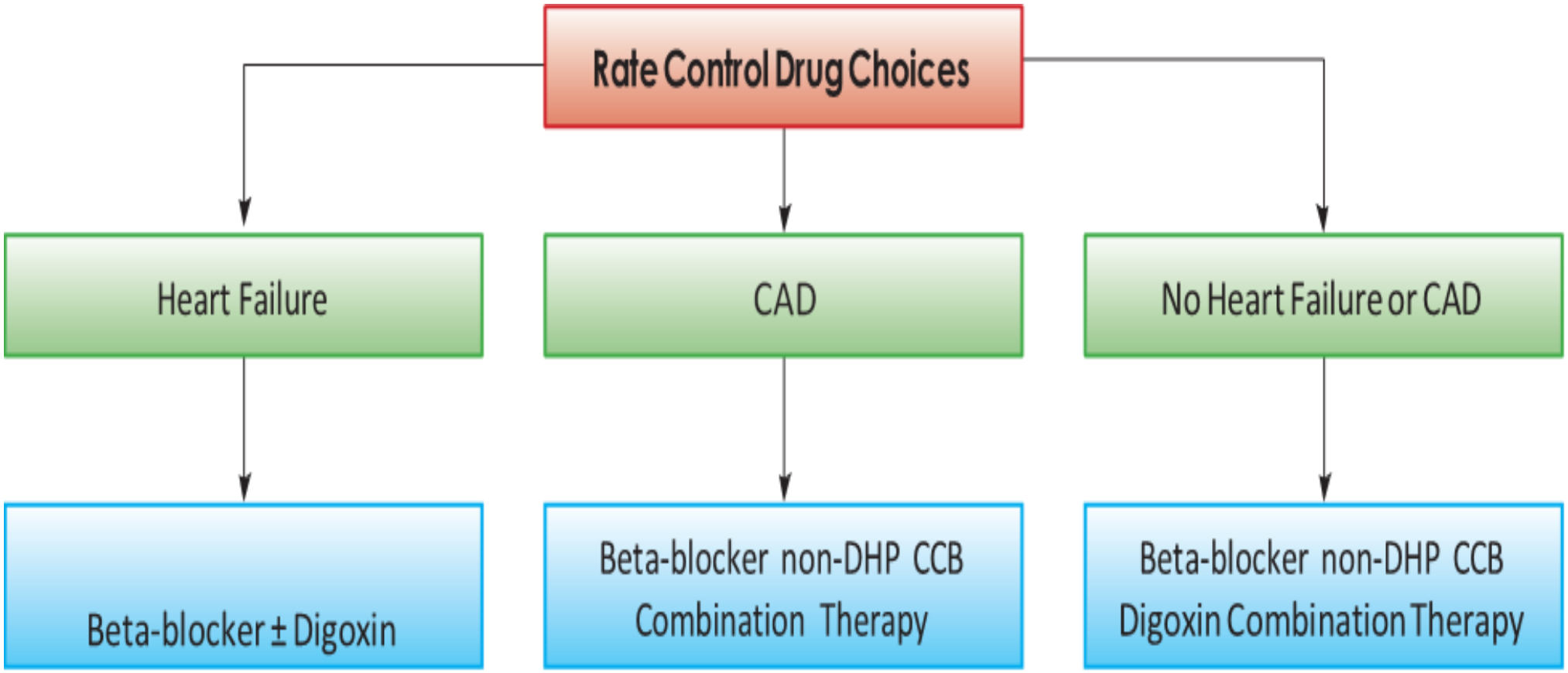
Abbreviations: ASA = acetyl-salicylic acid; CAD = coronary artery disease; OAC = oral anticoagulants.

Step 3 Rate or Rhythm?

Favours Rate Control	*Favours Rhythm Control*
• Persistent AF • Less symptomatic • Aged ≥ 65 years • Hypertension • No history of CHF • Previous antiarrhythmic drug failure • Patient preference • High stroke risk with cardioversion	• Paroxysmal AF • Newly detected AF • More symptomatic • Aged < 65 years • No hypertension • HF clearly exacerbated by AF • No previous antiarrhythmic drug failure • Patient preference • Low stroke risk with cardioversion

Abbreviations: AF = atrial fibrillation; CHF = congestive heart failure; HF = heart failure.
Adapted from: Gillis AM, et al. Canadian Cardiovascular Society Atrial Fibrillation Guidelines 2010: Rate and Rhythm Management, Canadian Journal of Cardiology 2011;27:47-59.

Rate Control



Case 3

66-year old grandmother presents with some shortness of breath with exertion, irregular heartbeats, dizziness, and feeling tired since last night. She is hypertensive, non-insulin dependent diabetic.

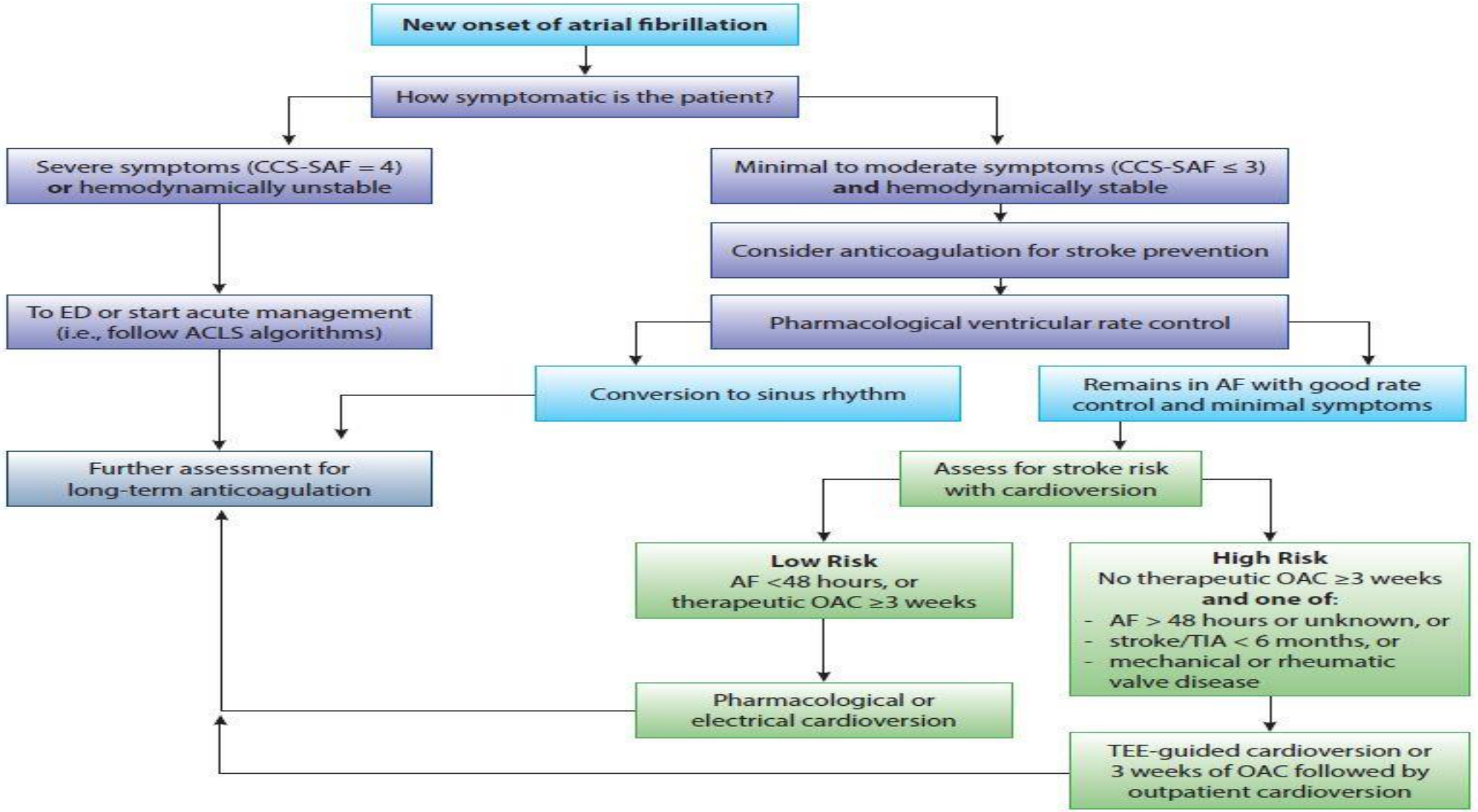
Case 3

Step 1

How symptomatic?

CCS-SAF Class 2

CCS-SAF =2, Onset < 24 hours



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Step 2 Anticoagulation

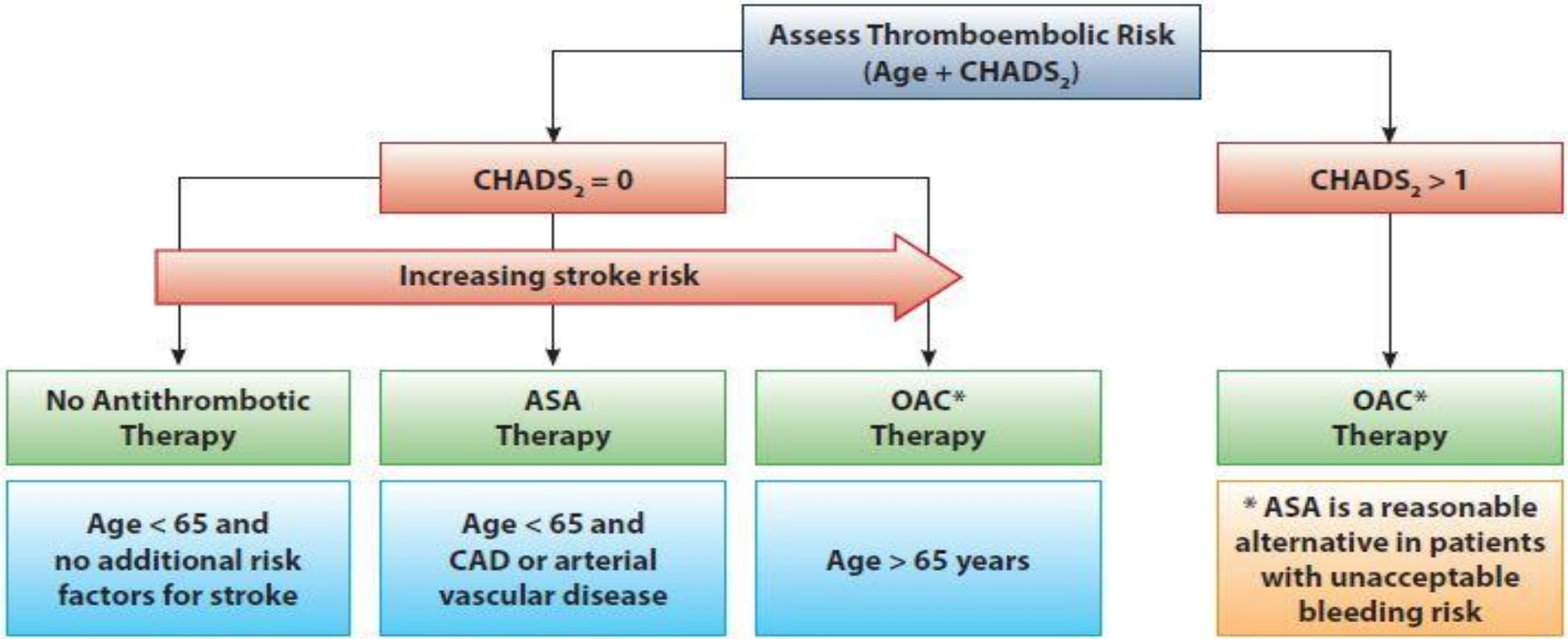
Anticoagulant?

1.Short term
2.Long Term

66-years, Diabetes, Hypertension
CHADS = 2

Letter	Clinical Characteristic	Score (if present)
C	Congestive heart failure	1
H	Hypertension	1
A	Age 75+	1
D	Diabetes	1
S	Prior Stroke or TIA	2
	Total $CHADS_2$ Score	Maximum score = 6

66-years, Diabetes, Hypertension
CHADS = 2



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Step 3 Rate or Rhythm?

Favours Rate Control	*Favours Rhythm Control*
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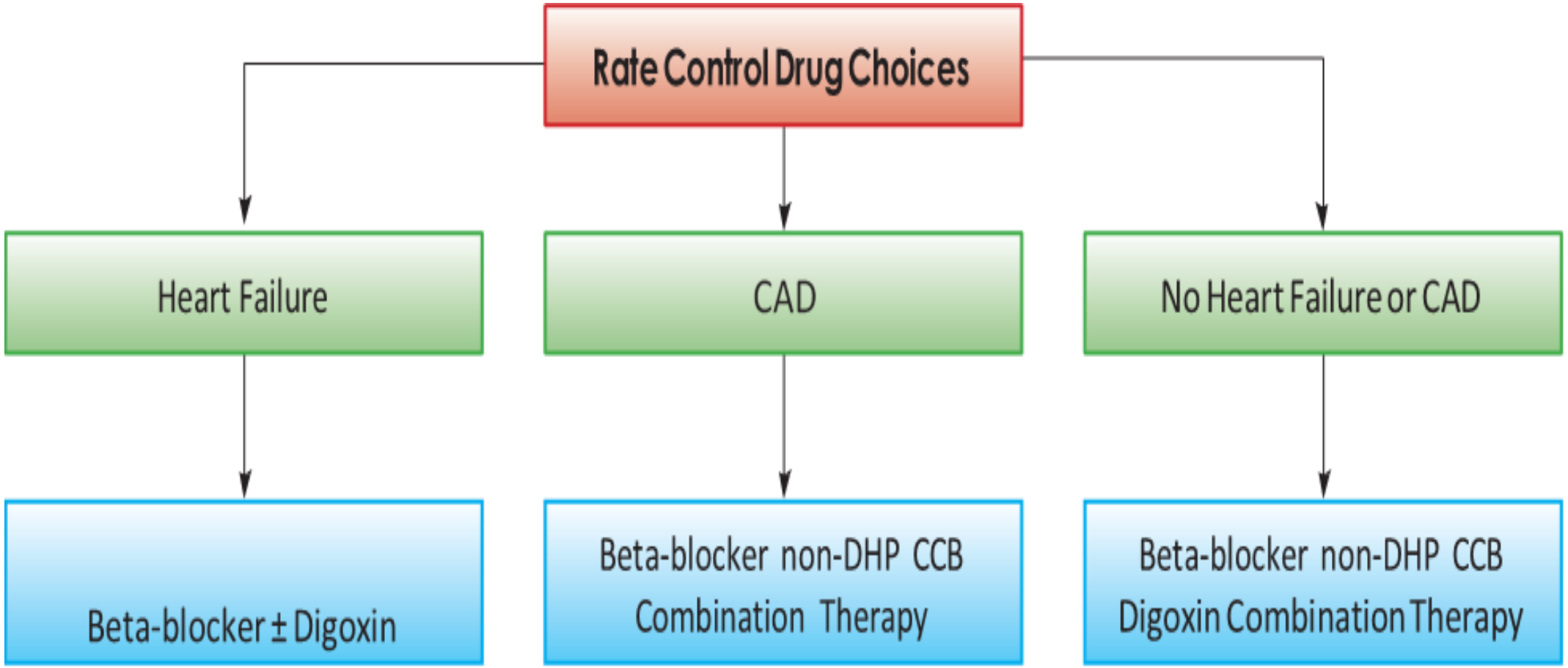
Rate Control



Case 4

- The patient is a 32 year old physician who the prior evening was out celebrating the marriage of his receptionist and consumed about 12 ounces of Johnny Walker Black Label.
- He went home by taxi, slept poorly and realized at about 6:00 A.M. that his heart was rapid and pulse irregular and he had a mild bitemporal headache.
- He is driven to the ED by his wife.

Case 4

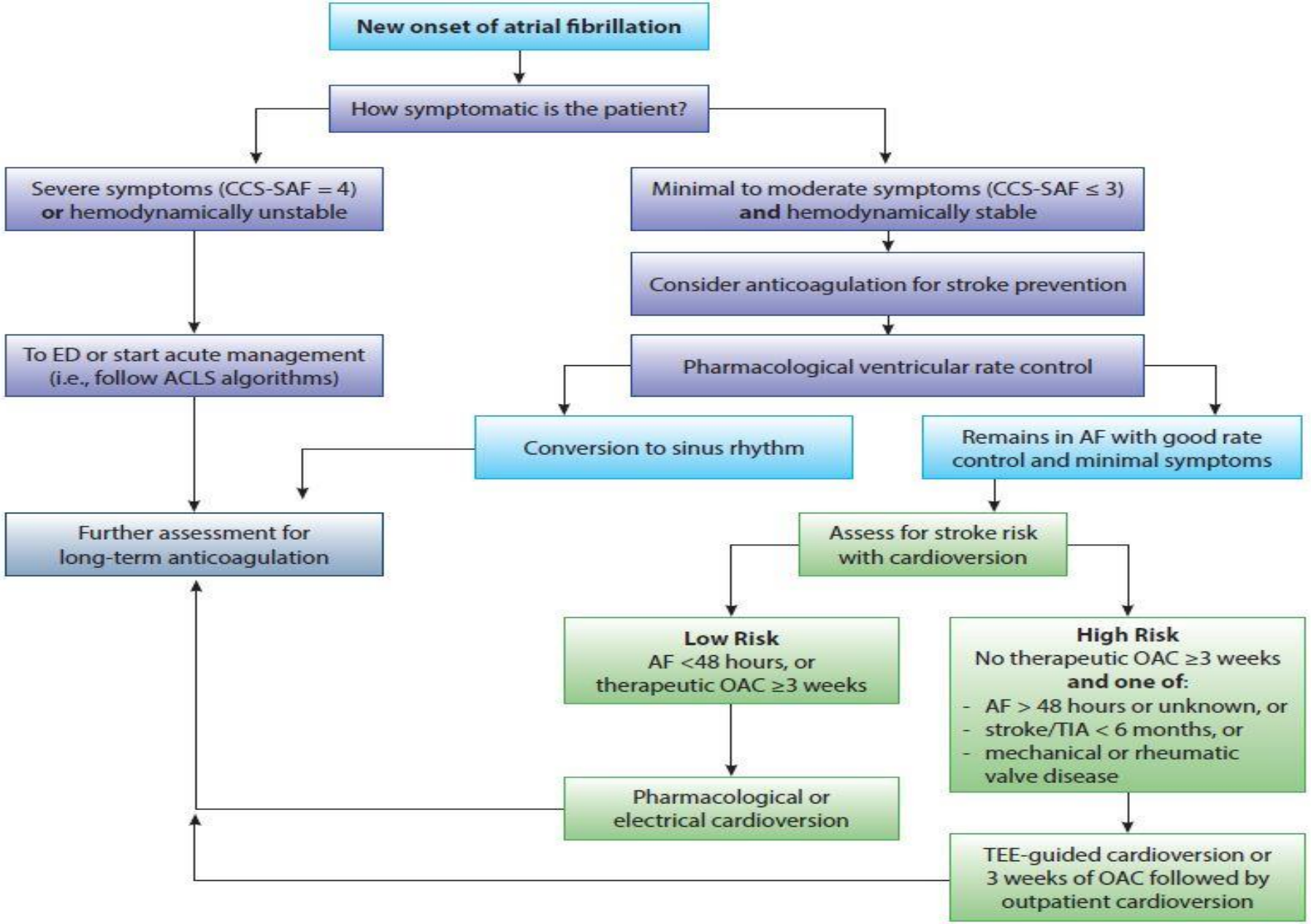
- He has been well, no known hypertension, DM, heart disease, TIA/stroke and no known arrhythmias. No COPD or asthma.
- In ED he has no chest pain, has mild SOB and is slightly sweaty.
- HR 140, irregularly irregular, BP 140/90, JVD 4 cm, chest clear.
- ECG shows AF, rate 140.

Case 4

Step 1 How symptomatic is patient

- CCS-SAF Class 2-3

Case 4



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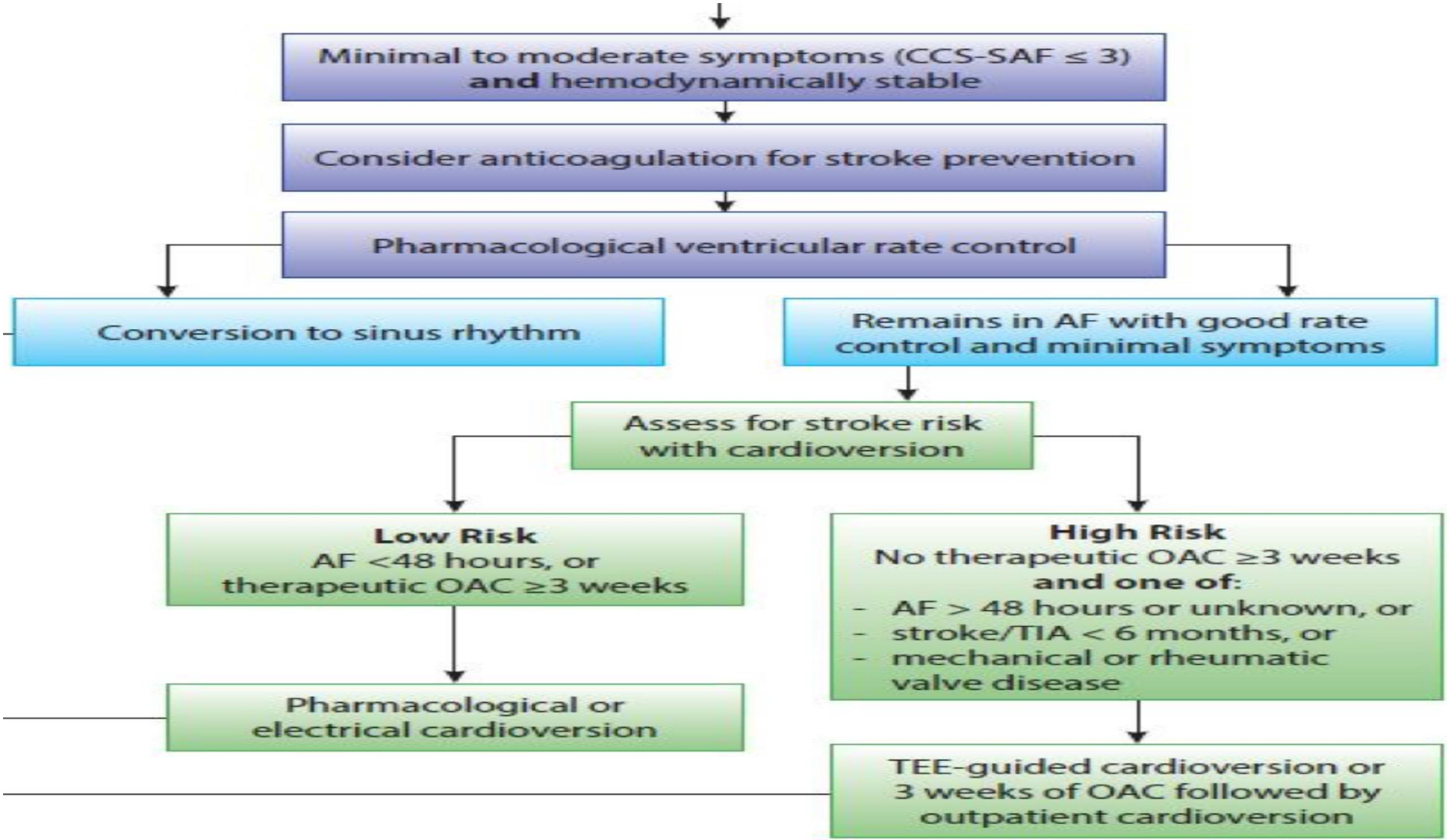
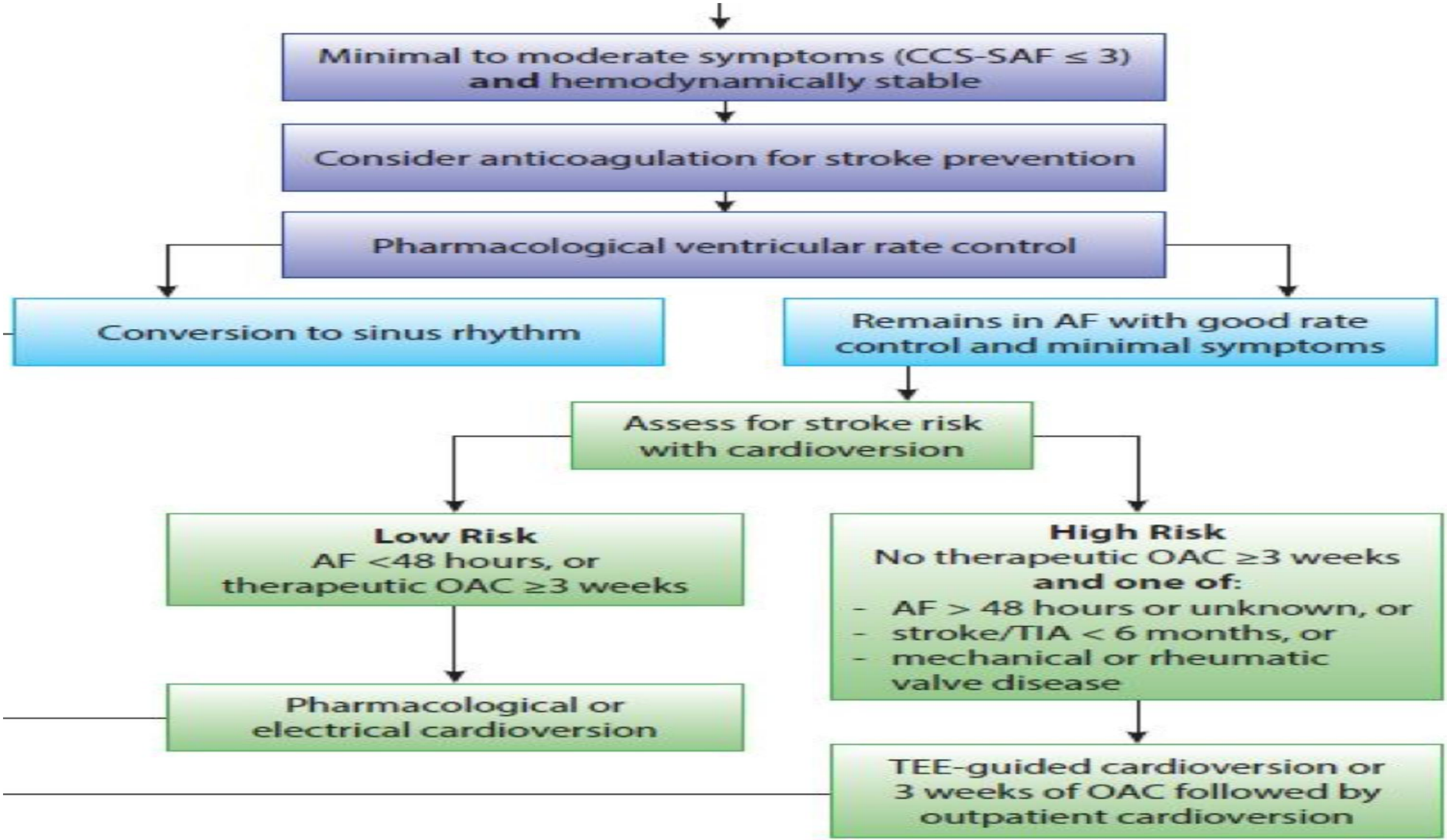

Minimal to moderate symptoms (CCS-SAF ≤ 3) and hemodynamically stable
Consider anticoagulation for stroke prevention
Pharmacological ventricular rate control
Conversion to sinus rhythm
Remains in AF with good rate control and minimal symptoms
Assess for stroke risk with cardioversion
Low Risk
AF <48 hours, or therapeutic OAC ≥3 weeks
High Risk
No therapeutic OAC ≥3 weeks and one of:
- AF > 48 hours or unknown, or
- stroke/TIA < 6 months, or
- mechanical or rheumatic valve disease
Pharmacological or electrical cardioversion
TEE-guided cardioversion or 3 weeks of OAC followed by outpatient cardioversion

Case 4

Step 2 Should an anticoagulant be used for stroke Prevention?

1. Short term
2. Long term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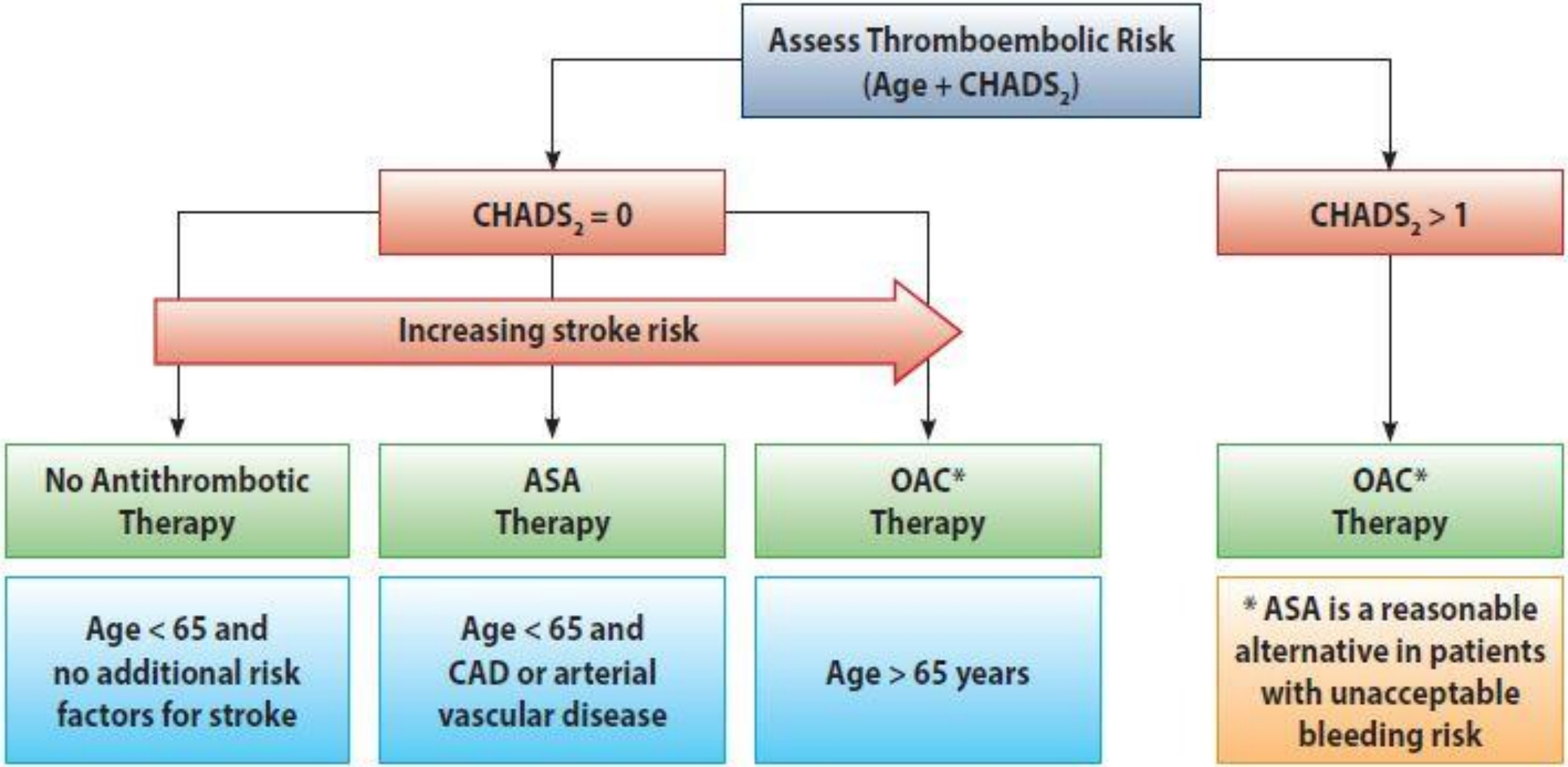

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Step 3 Rate or Rhythm Control?

Favours Rate Control	*Favours Rhythm Control*
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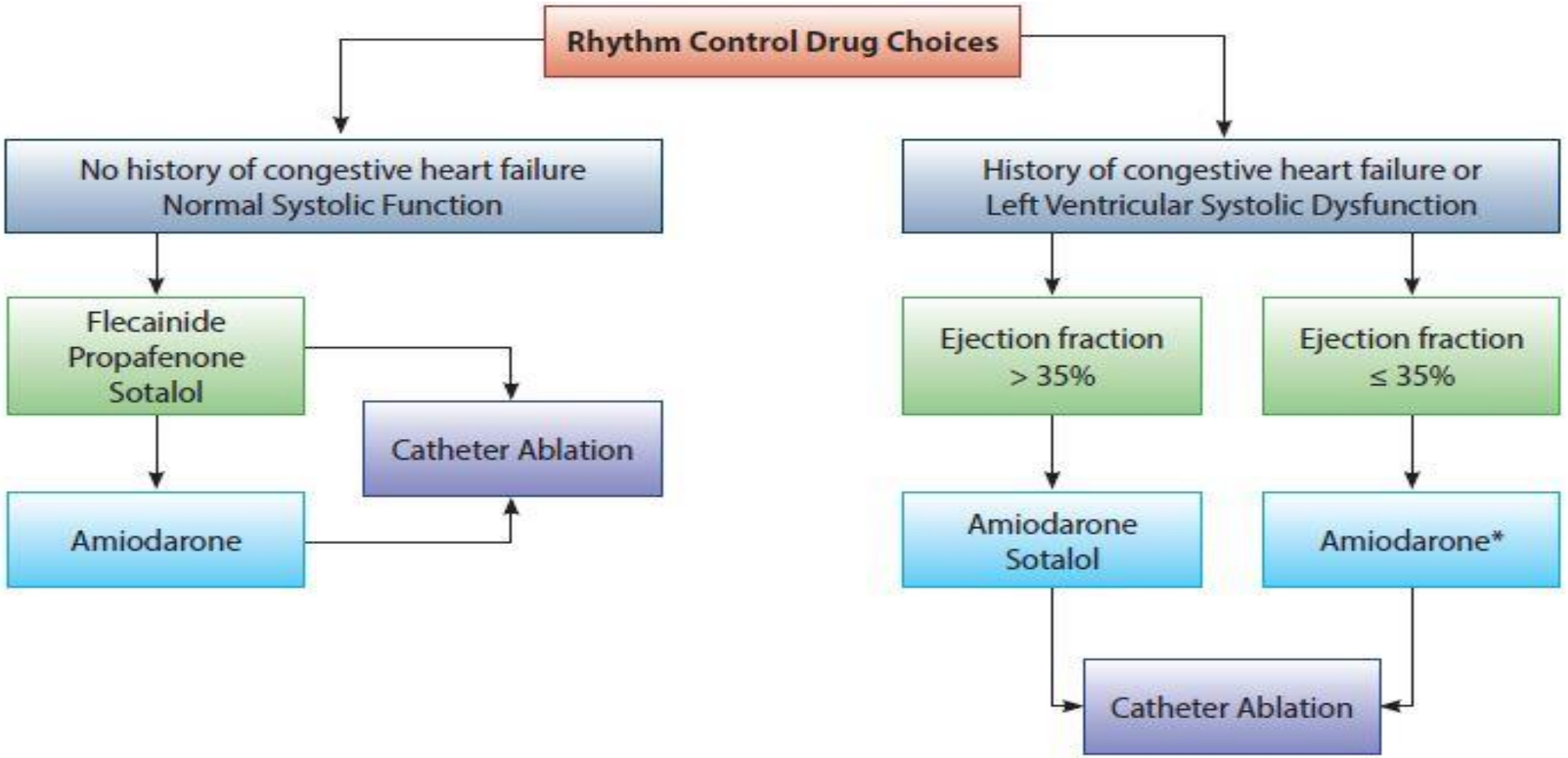
Case 4



Footnote: * In patients with left ventricular ejection fraction ≤ 35% amiodarone is the only drug recommended because of the low risk of proarrhythmia in heart failure.[28,29] Amiodarone or sotalol are recommended in those with ejection fraction > 35%.[17]

Summary

1. Determine the patient's cardiac stability and provide emergency stabilization if needed.
2. Consider all patients with atrial fibrillation for antithrombotic therapy (short and long term).
3. The goals of rate and/or rhythm control strategies are to improve patient symptoms, exercise tolerance, quality of life, prevent hospitalizations and improve left ventricular function.
4. Manage co-morbidities that may raise atrial fibrillation risk, such as hypertension, diabetes and heart failure.

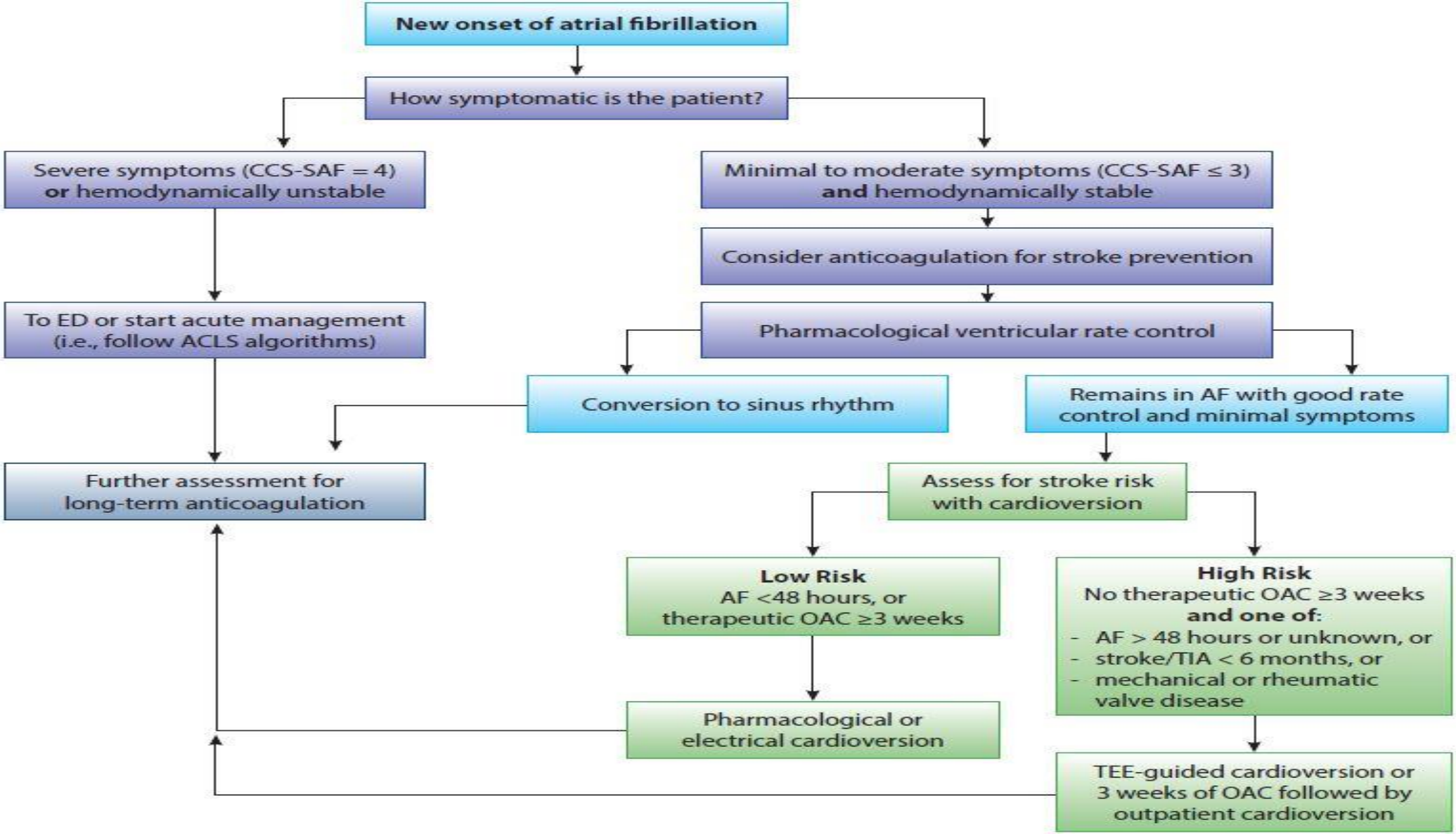
SUMMARY

Step 1 How Symptomatic is the Patient?

Step 2 Should an anticoagulant be Used for Stroke Prevention?

1. Short term
2. Long term

Step 3 Is this a Rate or Rhythm control strategy?



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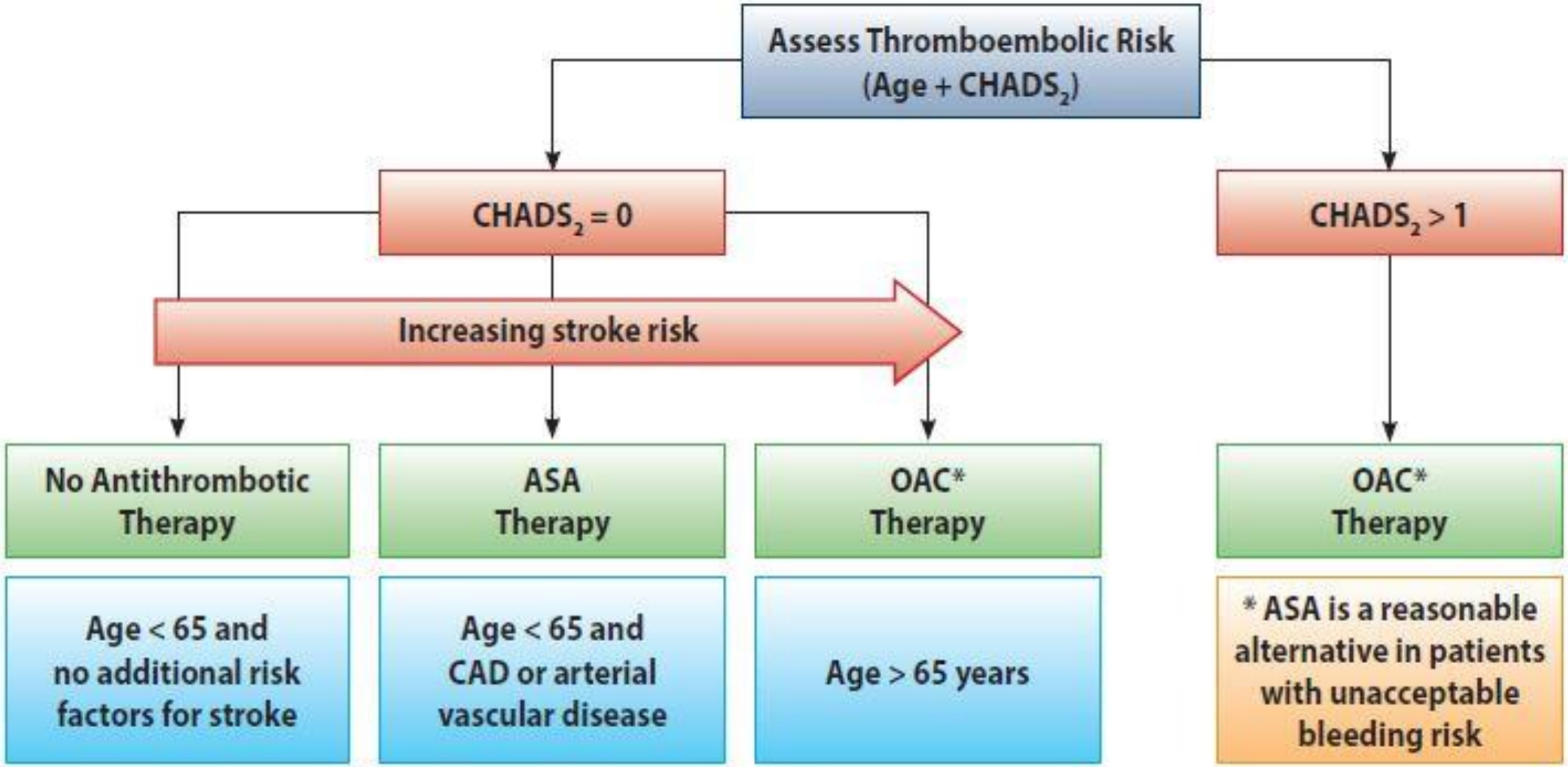

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Step 3
Rate or Rhythm Control?

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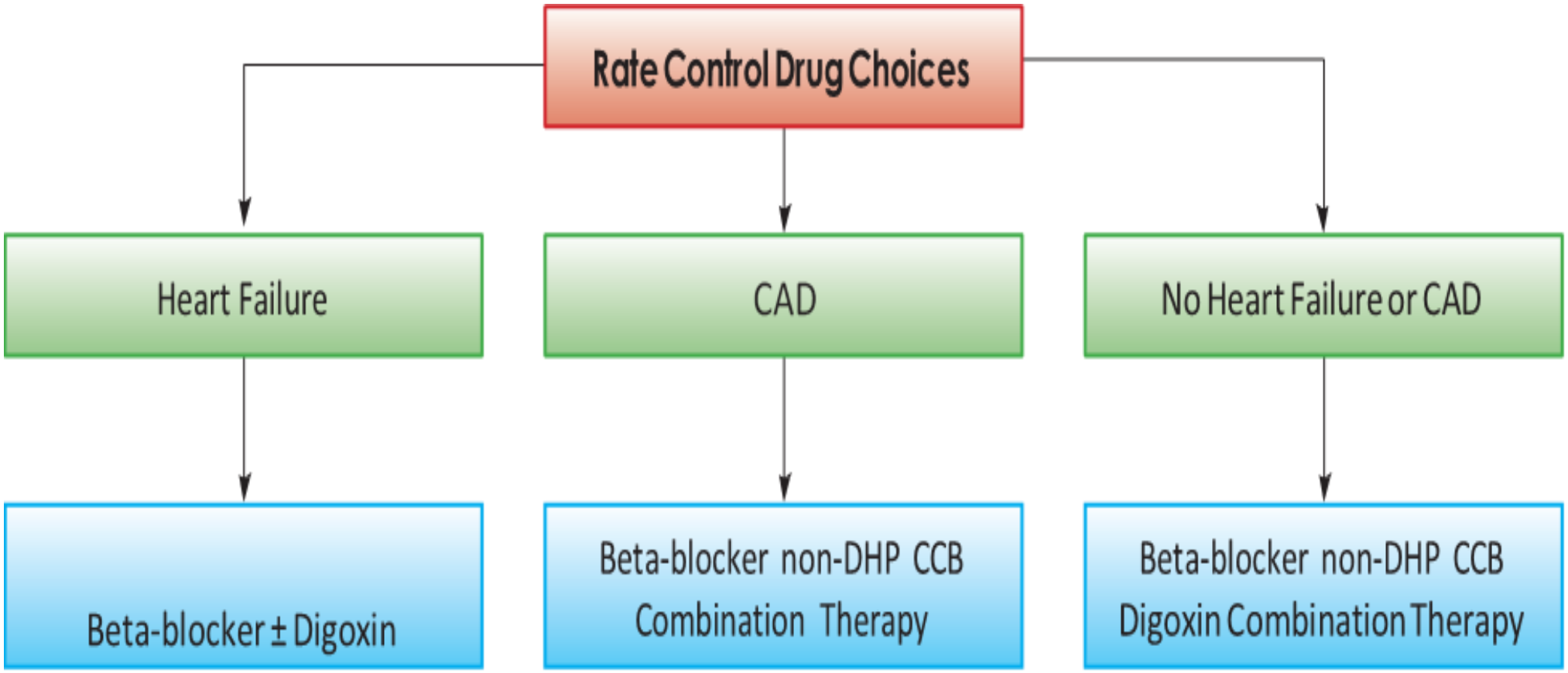
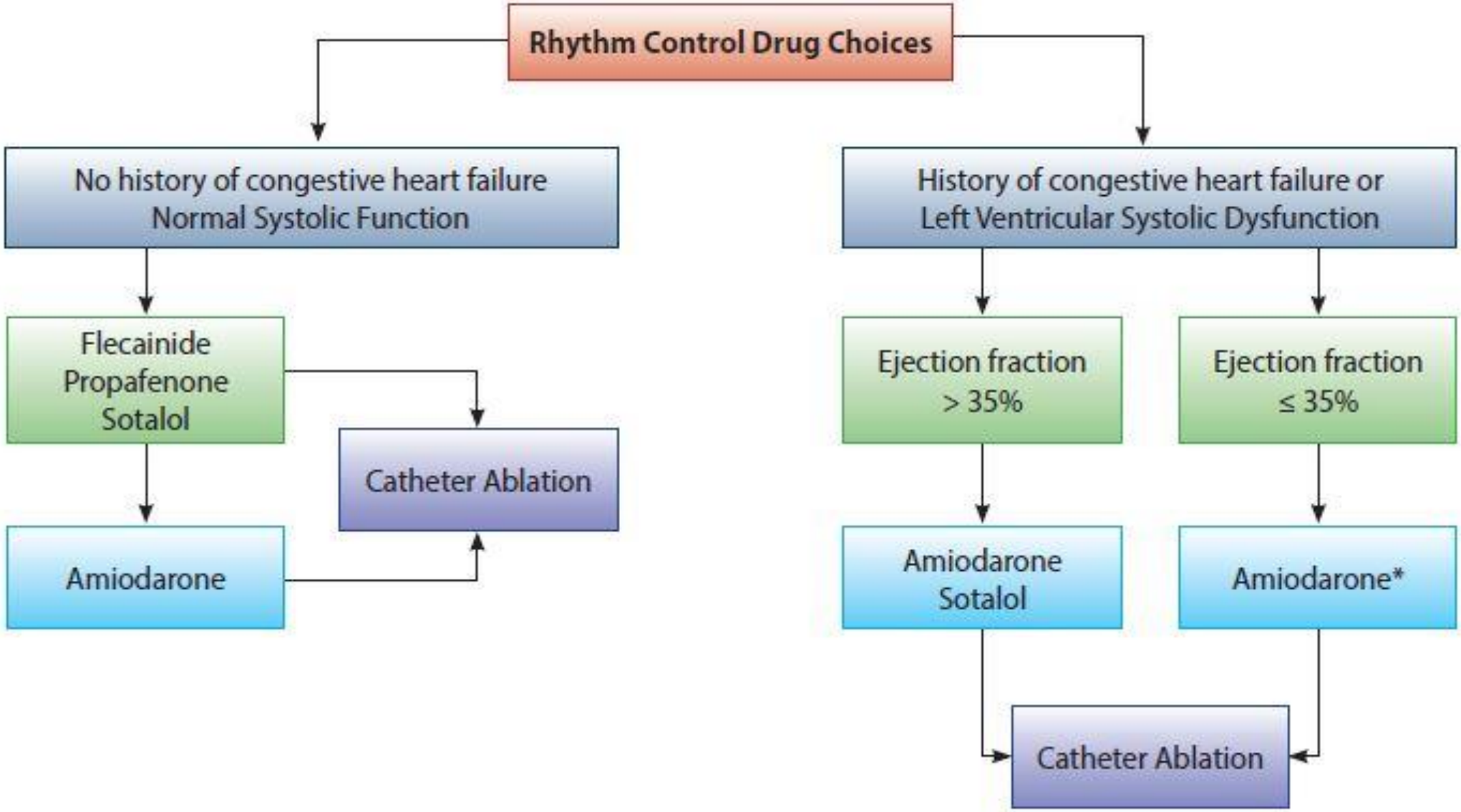
Rate Control



Rhythm Control



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