CLINICAL PRACTICE GUIDELINES SERIES – No 5

Management of acute coronary syndromes (ACS)

(Based on ACC/AHA Guidelines)

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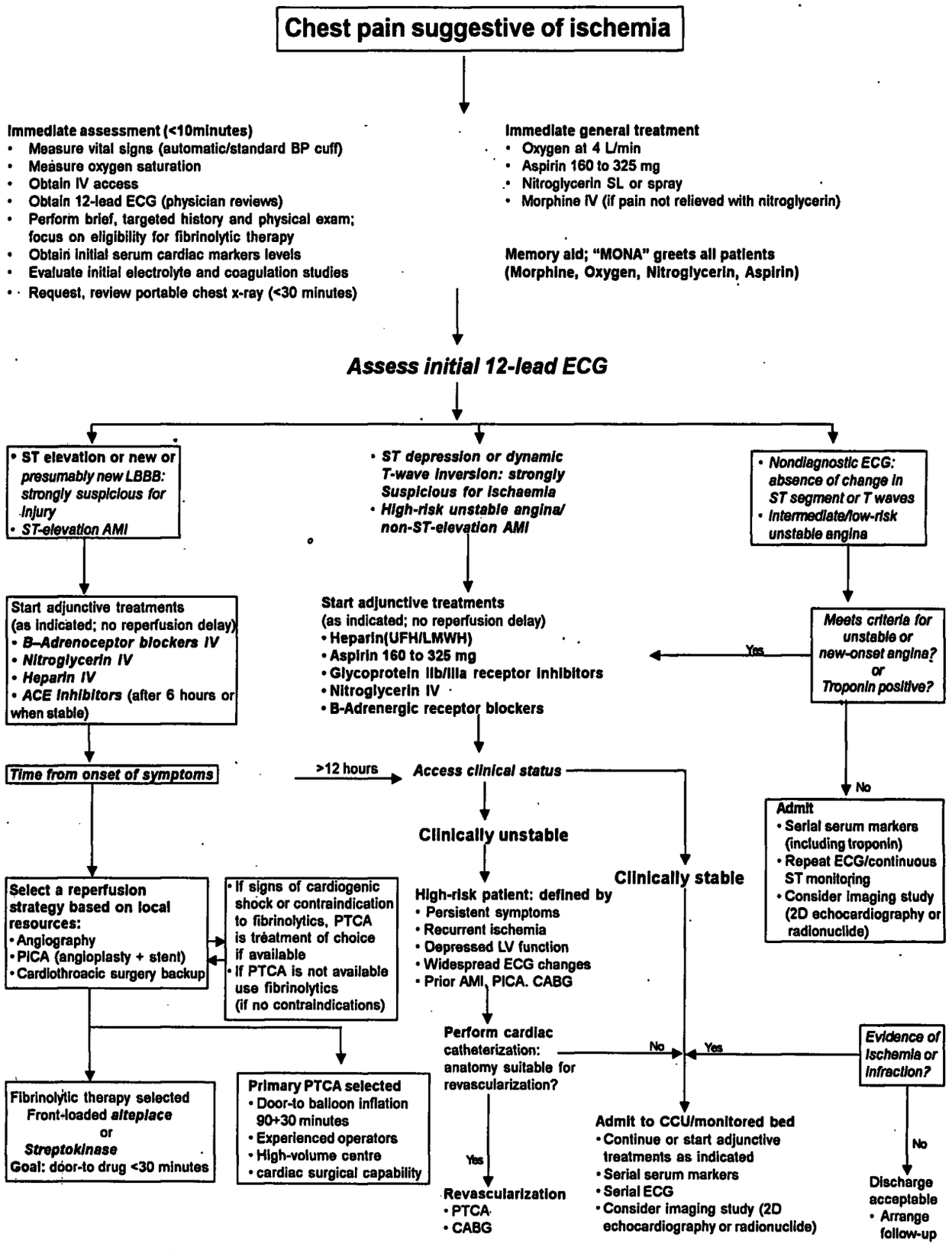
Journal of the Ceylon College of Physicians, 2003, **36**, 61-71

MANAGEMENT OF ACUTE CORONARY SYNDROMES QUICK REFERENCE GUIDE



This algorithm provides general guidelines that may not apply to all patients. Carefully consider proper indications and contraindications.

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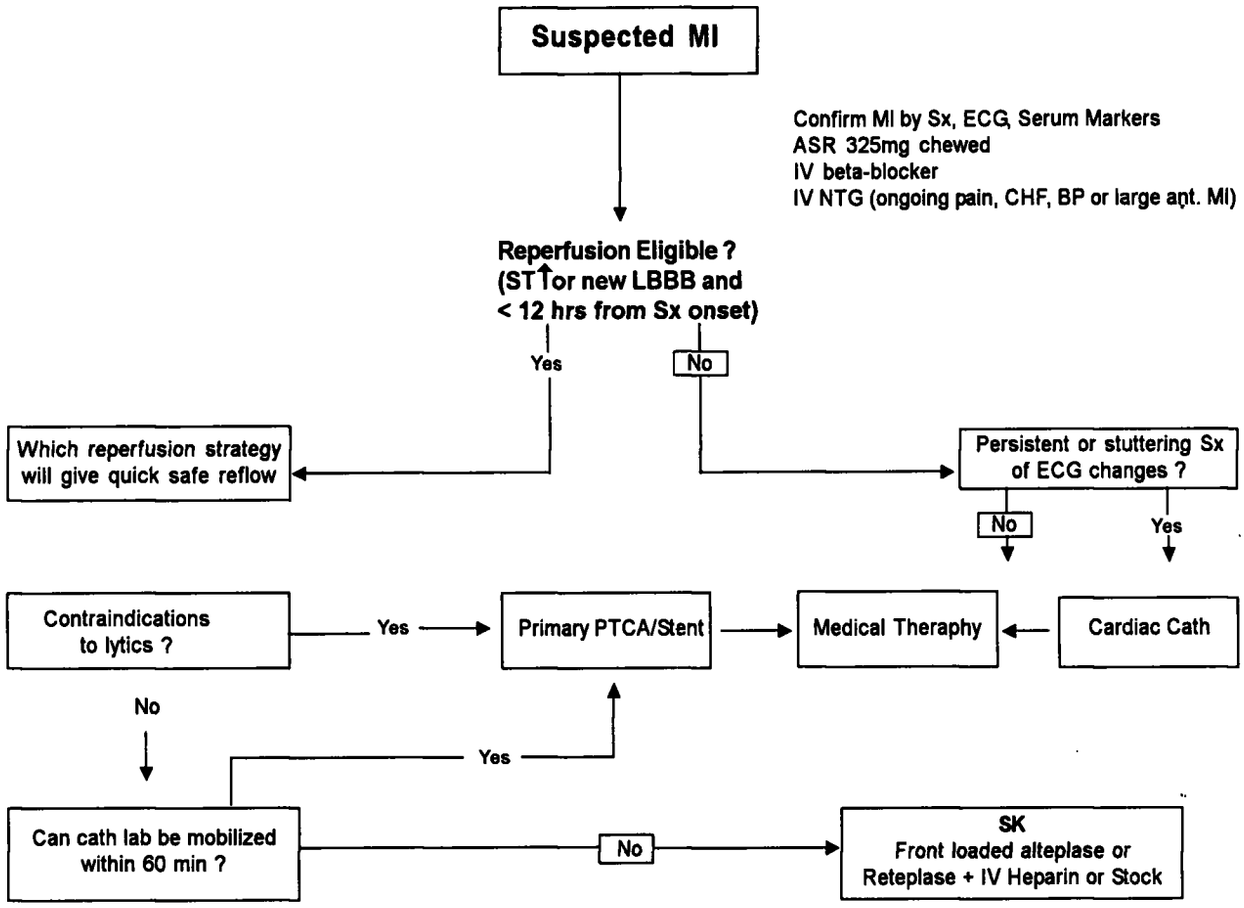
MANAGEMENT OF ST - ELEVATION MI



Indications for Cardiac Catheterization

Primary PTCA
Rescue for the failed fibrinolysis
Clinical Conditions
- Cardiogenic shock/hemodynamic instability
- CHF
- Suspected mechanical complications eg. VSD, ruptured papillary muscle
- Recurrent symptomatic arrhythmia

Ischemia on pre-discharge ETT

Contraindications and Cautions for Fibrinolytic Use in Myocardial Infarction

Absolute Contraindications

- Previous hemorrhagic stroke at any time: other strokes or cerebrovascular events within 1 yr
- Known Intracranial neoplasm
- Active internal bleeding (does not include menses)

Suspected aortic dissection

Cautions/Relative Contraindications

- Severe uncontrolled hypertension on presentation (blood pressure>180/110 mm Hg)*
- History of prior cerbrovascular accident or known intracerebral pathology not covered in Contraindications
- Current use of anticoagulants in therapeutic dose (INR>2-3); known bleeding diathesis
- Recent trauma (within 2-4 wks) including head trauma
- Noncompressible vascular punctures
- Recent (within 2-4 wks) internal bleeding
- For streptokinase/anistreplase: prior exposure (especially within 5d-2y) or prior allergic reaction
- Pregnancy
- Active peptic ulcer
- History of chronic hypertension

* Could be an absolute contraindication in low-risk patients with myocardial infarction.

Fibrinolytic Dosing

Alteplase,15mg bolus IV, followed by 50 mg over next 30 min, followed by 35 mg over next 60 min. Reteplase, double bolus 10 IU min apart

SK. 1.5 million IU in fused over 60 min.

ST-SEGMENT DEPRESSION, DYNAMIC T-WAVE CHANGE: NON-Q-WAVE INFARCTION-UNSTABLE ANGINA

Recommendations for Initial Management and Therapy

- In general, treat these patients with both
  - **Antithrombin (heparin) and an**
  - **Antiplatelet agent (aspirin)**

→ **Antithrombin (heparin) plus Antiplatelet (aspirin)**

- Modify this treatment if patient meets criteria for high risk →

High-Risk Criteria
- ST depression>1mm
- Persistent symptoms; recurrent ischemia
- Diffuse or widespread ECG abnormalities
- Depressed LV function
- Congestive heart failure
- Serum marker release: positive troponin or CK-MB+

Patients who meet **high-risk criteria** benefit
- **Aspirin** *and*
- **GP IIb/IIIa inhibitors** *and* **unfractionated heparin** *or*
- **Low-molecular weight heparin** (efficacy and safety combined with GP IIb/IIIa inhibitors under review)

→ **Antithrombin (heparin) plus Antiplatelet (aspirin) plus Glycoprotein IIb/IIIa inhibitors**

All patients without contraindications should receive → **β-Blockers**

Patients who suffer recurrent angina should also receive → **Nitrates**

As a third agent to use for refractory angina or in patients with a contraindication to B-blockers → **Calcium channel blockers**

Recommendation for initial management and therapy of ST-segment depression, dynamic T-wave changes, (non-Q-wave infarction, and unstable angina).

MANAGEMENT OF ACUTE MYOCARDIAL INFARCTION

Pharmacological Therapy

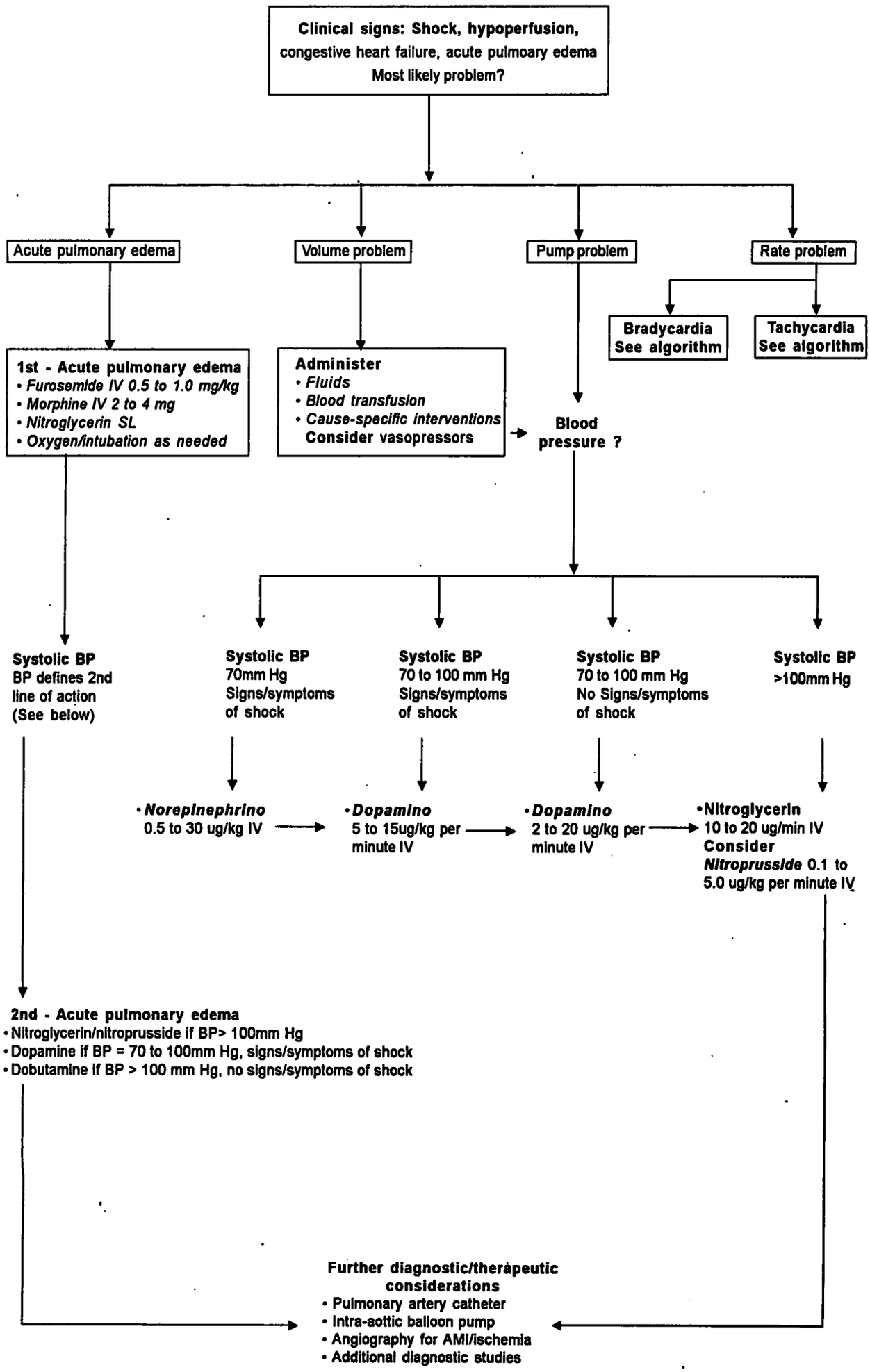
Medication	First 24 Hours	After 24 hours	Discharge
Aspirin	Chewed (in ED) (325mg)	180-325mg qd	81mg qd indefinitely
Reperfusion for ST ↑ or new LBBB <12hrs of symptom onset	Front loaded RX treatment fibrinolytics* or Primary PICA	Reperfusion: alteplase/reteplase can be repeated for recurrent occilusion	Coumarin for 3-6 if LV thrombus seen or thromboembolism: chronically for AF
Heparin (unfractionated UFH)	IV in alteplase, reteplace, PTCA treated patients and non-ST elevation MI: large or ant MI, AF, prior embolus, LV thrombus 60 U/kg bolus, infusion 12 U/kg/hr (max 4000 U bolus/ 1000 U/hr infusion for pts>70kg) to maintain aPTT 50-70 seconds	48 hrs alteplase, reteplase treated patients: SubQ heparin for all until ambulatory	
Low Molecular Weight Heparin (LMWH)	Subcutaneoulsy (SC) 1mg/kg b.i.d. for patients with non-ST elevation MI if no contraindications; all patients not treated with fibrinolytics, if no contraindications (alternative to UFH)		
Beta-Blockers**	IV Metoprolol (up to 15mg in 3 divided doeses) or IV Atenolol (10mg in 2 divided doses)	Oral Metoprolol 50-100mg daily or Atenolol 50-100 qd or other beta-blockers	Oral daily indefinitely
ACE inhibitors	Initial doses 6.25mg captoprill followed by 12.5 mg 2 hrs later, 25mg 10-12 hrs later, then 50 mg b.i.d. Or lisinopril 5mg initially, 5mg after 24hrs, 10mg after 48hrs, then 10mg daily	Daily for up to 6 wks	Longer if Sx CHF or LVEF<40%
GPIIb/IIIa Inhibitors	Tirofiban 0.4 up/kg/min over 30 min. Then infuse 0.1 ug/kg/min for non -ST elevated MI patients at high-risk (elevated serum markers, refractory ischemia)		
Nitroglycerin	IV for 24-48 hrs if no conrraindications	Only for ongoing ischemia or uncontrolled hypertension	Oral for residual ischemia
Statins			Indefinitely if LDL-C>100mg/dl
Hormone Replacement Theraphy (HRT)		After 1st 24hrs-should not be given de novo to postmenopausal women after acute MI. Women already taking HRT plus progestin at time of AMI can continue. Counsel all postmenopausal women about potential benefits or HRT.	Offer options of HRT

**Cautions/Relative Contraindications: Heart rate<60 bpm; PR interval>0.24 seconds; severe PVD; SAP<100mm Hg; 2nd or 3rd AV block; IDDM; signs of peripheral hypoperfusion; severe COPD; serve LV failure; Hx of Asthma

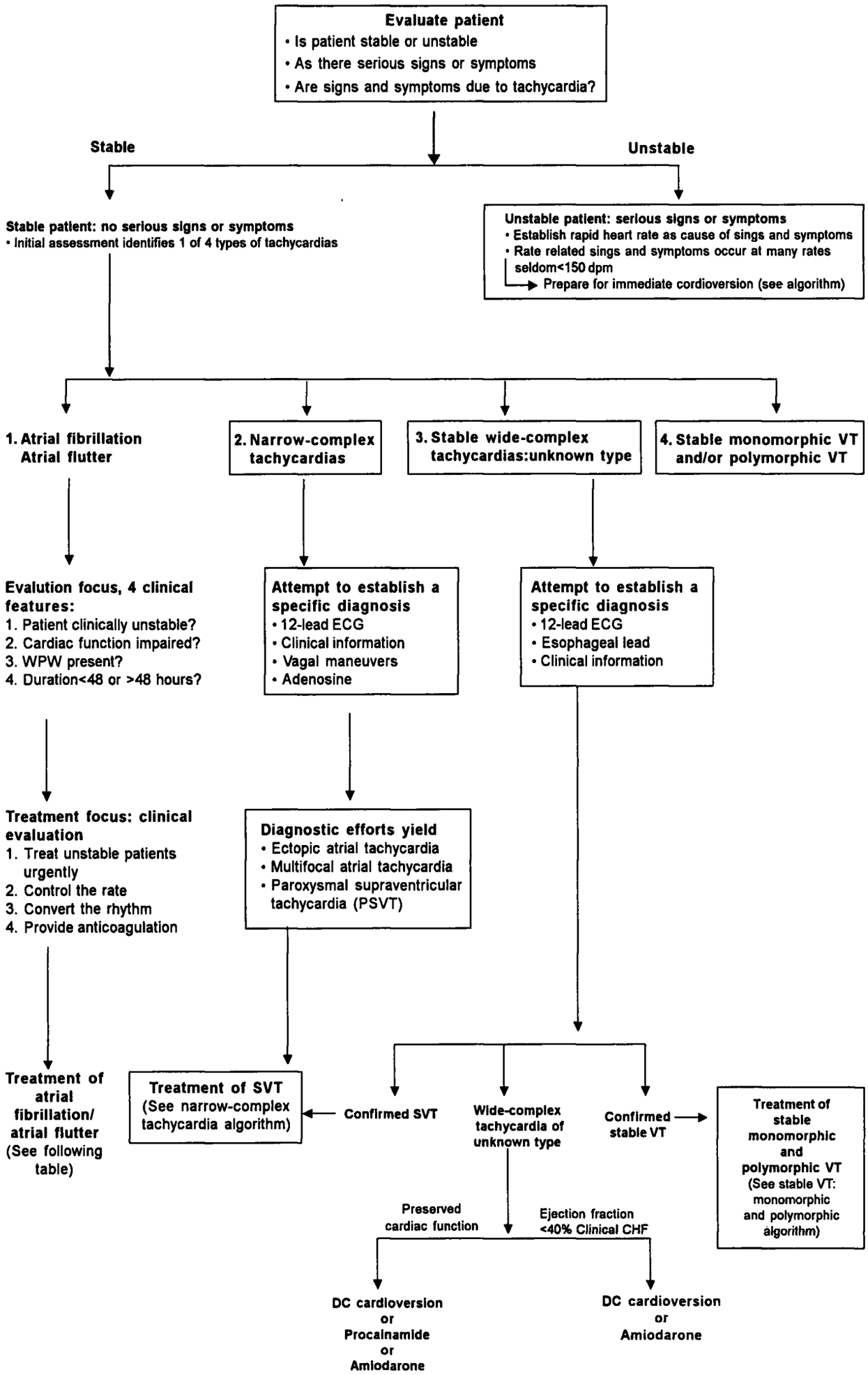
Non-pharmacological Therapy

Therapy	First 24 Hours	After 24 hours	Discharge
Dietary Advice		Education on low-fat diet	Recommend low-fat diet
Smoking	Reinforce cessation	Reinforce cessation	Referral to smoking cessation classes if desired
Exercise			Recommend regular aerobic exercise
Pre-discharge ETT	For uncomplicated patient in 4-5 days	Perform pre-discharge ETT	Cath patients with significant ischemia
Measure LVEF		ECHO	ACE inhibitors if LVEF<40% or in-hospital CHF
Cardiac Rehabilitation		Start exercise	Refer to rehab program near their home

MANAGEMENT OF COMPLICATED AMI
THE ACUTE PULMONARY EDEMA, HYPOTENSION, AND SHOCK ALGORITHM



THE TACHYCARDIA OVERVIEW ALGORITHM



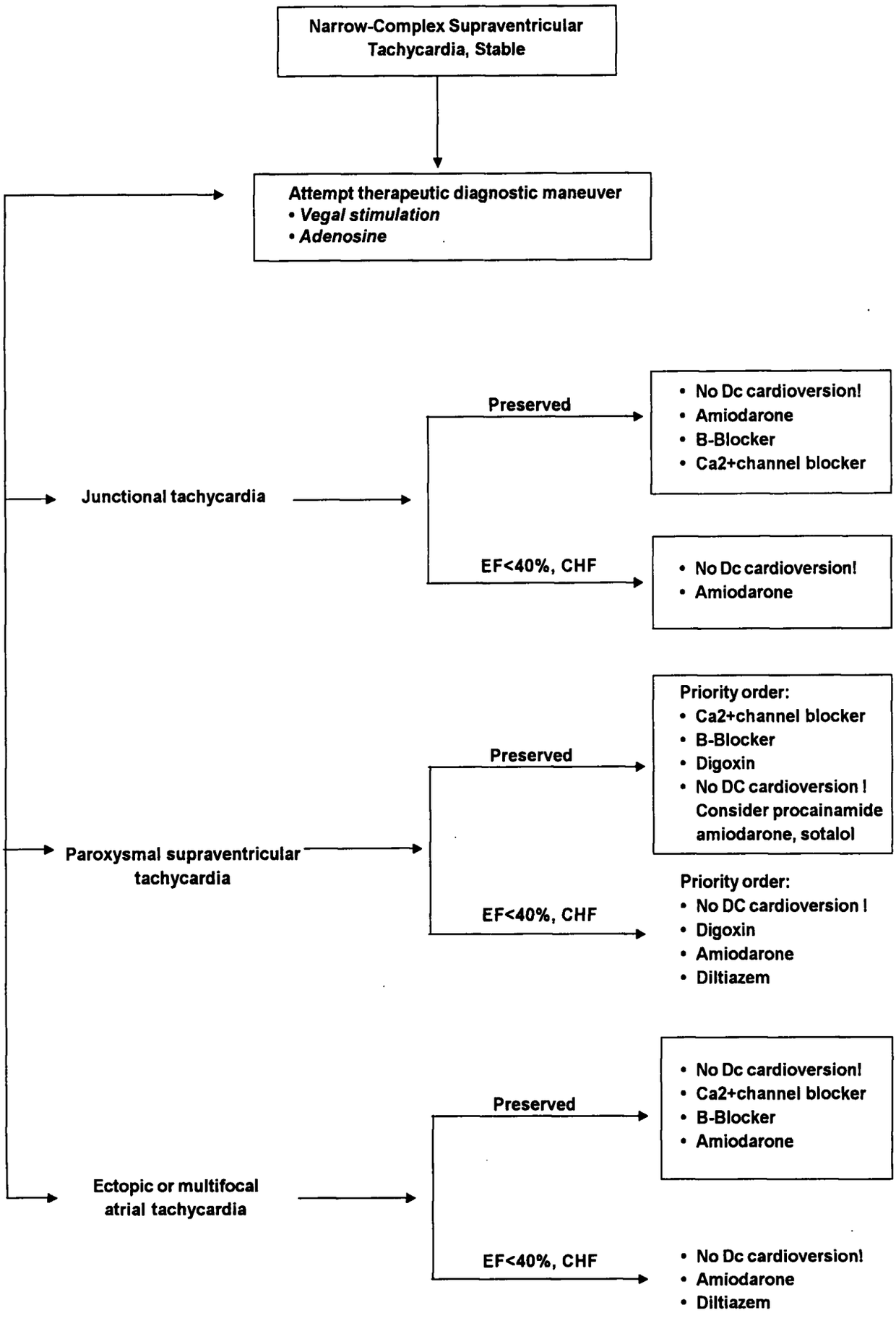
ATRIL FIBRILLATION / ATRIAL FLUTTER

Atrial fibrillation atrial flutter with • Normal heart • Impaired heart • WPW	1. Control Rate Heart Function Preserved	Imparied Heart EF<40%orCHF	2. Convert Rhythm Duration<48Hours	Duration<48Hours or Unknown
Normal cardiac function	**Note:** *If AF>48hours duration, use agents to convert rhythm with extreme caution in patients not receiving adequate anticoagulation because of possible embolic complications.* *Use only 1 of the following agents (see note below):* • Calcium channel blockers • B-Blockers	*(Does not apply)*	**Consider** DC cardioversion *Use only 1 of the following agents (see note below):* • *Amiodarone* • *Flecainide* • *Propafenone* • *Procainamide*	• **No DC cardioversion!** • **Note:** *Conversion ofAF to NSR with drugs or shock may cause embolization of atrial thrombi unless patient has adequate anticoagulation* • Use antiarrhythmic agents with extreme caution if AF >48 hours duration (see note above): ***or*** ***Delayed cardioversion*** ***Anticoagulation x 3 weeks at proper levels*** • Cardioversion, then • Anticoagulation x 4 weeks more ***or*** ***Early cardioversion*** • Begin IV heparin at once • TEE to exclude atrial clot **then** Cardioversion within 24 hours **then** • Anticoagulation x 4 more weeks
Normal heart (EF<40% or CHF)	*(Does not apply)*	**Note:** *If AF>48hours duration, use agents to convert rhythm with extreme caution in patients not receiving adequate anticoagulation because of possible embolic complications.* *Use only 1 of the following agents (see note below):* • Digoxin • Diltiazem • Amiodarone	**Consider** • DC cardioversion *or* • Amiodarone	• **Anticoagulation as described above,followed by** • **DC cardioversion**
WPW	**Note:** *If AF>48hours duration, use agents to convert rhythm with extreme caution in patients not receiving adequate anticoagulation because of possible embolic complications.* • *DC cardioversion* *or* • **Primary antiarrhythmic agents** Use only 1 of the following agents (see note below): • Amiodarone • Procainamide • Flecainide ***can be harmful*** • Adenosine • B-Blockers • Calcium blockers • Digoxin	**Note:** *If AF>48hours duration, use agents to* convert rhythm with *extreme caution in patients not receiving adequate anticoagulation because of possible embolic complications.* • DC cardioversion or • Amiodarone	• DC cardioversion or Primary antiarrhythmi agents *Use only 1 of the following agents (see note below**)* • Amiodarone • Procainamide • Flecainide ***can be harmful*** • Adenosine • B-Blockers • Calcium blockers • Digoxin	• **Anticoagulation as described above,followed by** • **DC cardioversion**

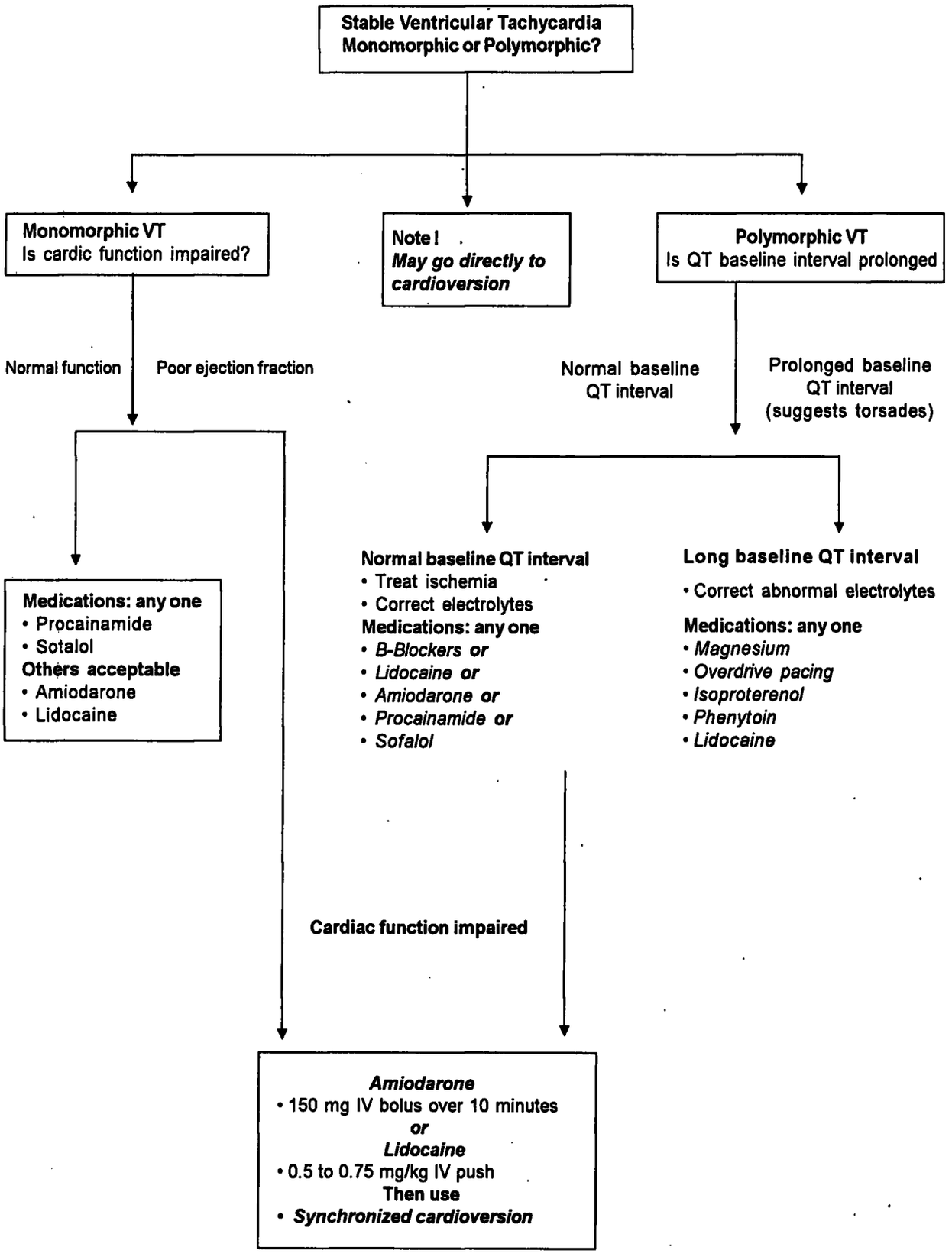
WPW indicates Wolff-Parkinson - White syndrome; AF atrial fibrillation; NSR, normal sinus rhythm: TEE, transesophageal echocardiogram; and EF, ejection fraction

Note: Occasionally 2 of the named antiarrhythmic agents may be used, but use of these agents in combination may have proarrhythmic potential.

NARROW-COMPLEX SUPRAVENTRICULAR TACHYCARDIA ALGORITHM



STABLE VENTRICULAR TACHYCARDIA (MONOMORPHIC OR POLYMORPHIC) ALGORITHM



UNSTABLE PATIENT - CARDIOVERSION

Tachycardia:
With serious sign and symptoms related to the tachycardia

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If ventricular rate is >150 bpm, prepare for immediate cardioversion. May give brief trial of medications based on specific arrhythmia. Immediate cardioversion is generally not needed if heart rate is <150 bpm.

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Have available at bedside
- Oxygen saturation monitor
- Suction device
- IV line
- Intubation equipment

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Premedicate whenever possible

↓

Synchronized cardioversion **2,3,4,5,6**
- Ventricular tachycardia
- Paroxysmal supraventricular tachycardia
- Atrial fibrillation
- Atrial flutter

→ 100 J. 200 J 300 J, 360 J, monophasic energy dose (or clinically equivalent biphasic energy dose)

Notes:
1. Effective regimens have included a sedative (eg, diazepam, midazolam, barbiturates, etomidate, ketamine, methohexital) with or without an analgesic agent (eg, fentanyl, morphine, meperidine). Many experts recommend anesthesia if service is readily available.
2. Both moncphasic and diphasic waveforms are acceptable if documented as clinically equivalent to reports of monophasic shock success.
3. Note possible need to resynchronize after each cardioversion.
4. If delays in synchronization occur and clinical condition is critical, go immediately to unsynchronized shocks.
5. Treat polymorphic ventricular tachycardia (irregular form and rate) like ventricular fibrillation: see ventricular fibrillation/pulseless ventricular tachycardia algorithm.
6. Paroxysmal supraventricular tachycardia and atrial flutter often respond to lower energy levels (start with 50 J).

BRADYCARDIA ALGORITHM