

TACHYARRHYTHMIA

(Last updated October 2020; Reviewers: Aysun Tekin, MD; Ognjen Gajic, MD)

PRESENTING COMPLAINT: Palpitations, shortness of breath, lightheadedness.

FINDINGS

- A Check airway
- B N/↑ breathing
- C ↑HR, rapid uncoordinated heart rate >100/min, ↓/N BP
- D Altered variable (V,P,U,D)* Presyncope/syncope
- E Pallor, diaphoresis
- UPC Cardiac structural defects, pulmonary edema, LV/RV function, IVC (intravascular volume status)
- L_{PC} CBC, ↓potassium, ↓magnesium, cardiac enzymes (in selected cases)
 - Other labs: thyroid function

* V (verbal), P (pain), U(unconscious), D (delirious)

PC: (point-of care)

OTHER HISTORY

Signs and symptoms

- Tachycardia
- Hypotension
- Tachypnea
- Distressed patient

Predisposing Conditions/ Underlying Etiology

- Hypoxemia

- Hypo/hypervolemia
- Sepsis
- Myocardial infarction
- Congestive heart failure
- Electrolyte imbalances (hypokalemia, hypomagnesemia)
- Hyperthyroidism
- Positive chronotropic medications
- Pulmonary embolism

DIFFERENTIAL DIAGNOSIS

Based on the QRS complex on ECG:

- **Wide QRS:**
 - Ventricular tachycardia (VT)
 - Supraventricular tachycardia with aberrancy (SVT)
- **Narrow QRS:**
 - Irregular
 - Atrial fibrillation (AFib)
 - Multifocal atrial tachycardia (MAT)
 - Regular
 - Sinus tachycardia
 - Atrial flutter (Aflutter)
 - AV nodal reentrant tachycardia (AVNRT)
 - Reentry SVT
 - Wolff-Parkinson-White (WPW) syndrome
 - Accelerated junctional rhythm

Assess duration and stability.

THERAPEUTIC INTERVENTIONS

General:

- Assess and treat underlying cause.
- Consider urgent electrical cardioversion regardless of the type if hemodynamically unstable due to arrhythmia.
- Narrow complex tachycardia:
 - Consider adenosine or vagal maneuvers as a diagnostic/therapeutic modality.
- If relative hypotension present, consider IV calcium prior Ca channel blockers to decrease propensity for hypotension.

Specific:

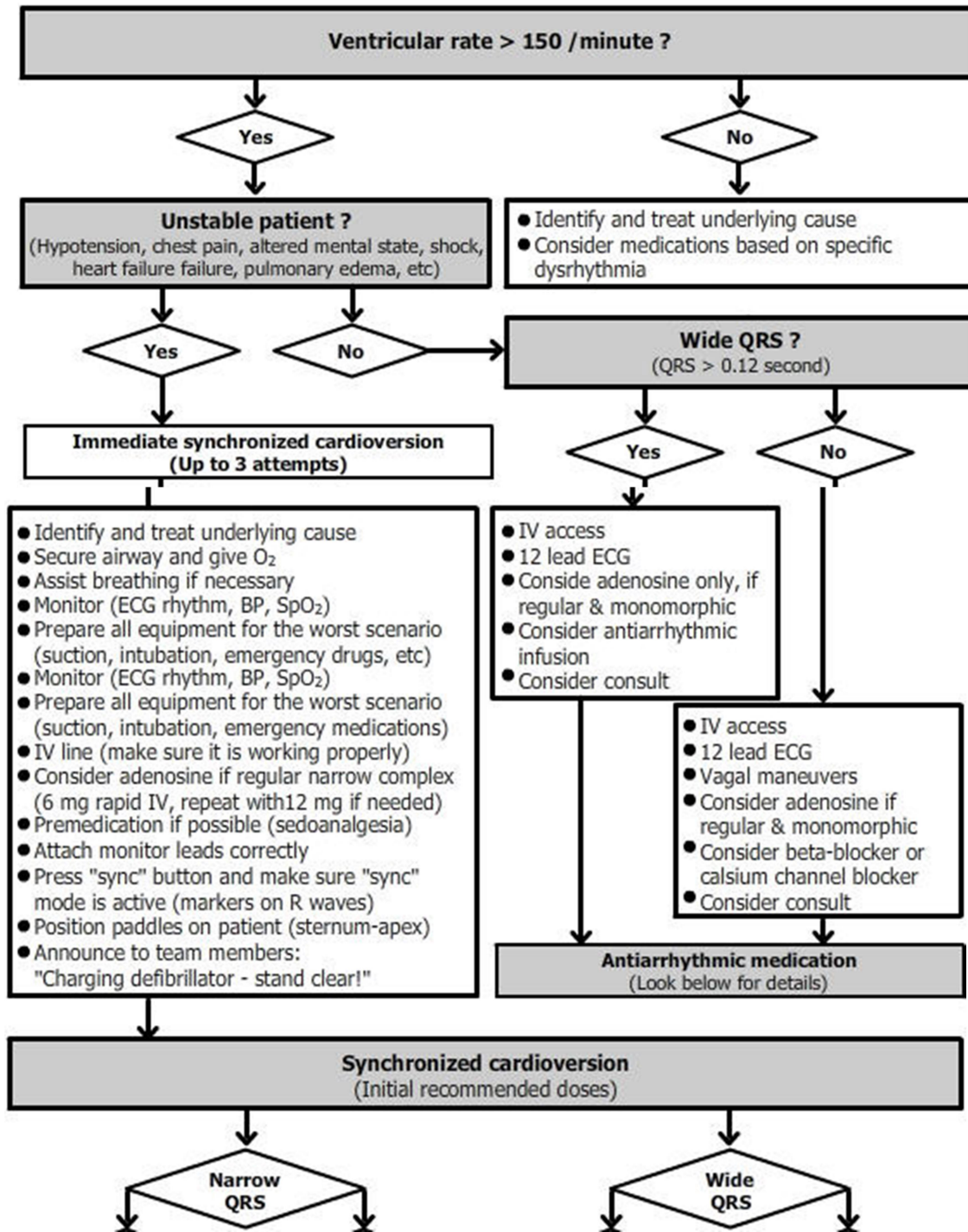
- **Stable VT:**
 - **Polymorphic VT**
 - No adenosine
 - IV Beta blockers (BB) or amiodarone
 - Consider myocardial ischemia
 - **Stable Torsades de pointes (prolonged QT)**
 - Correct electrolytes
 - Beta blockers, Magnesium IV
 - Acute pacing
 - **Stable Monomorphic VT**
 - Pharmacologic cardioversion: amiodarone, lidocaine, procainamide, sotalol
- **SVT and AVNRT:**
 - **Junctional Tachycardia (JT)**
 - Rate control with amiodarone/Beta blockers/Calcium channel blockers
 - No electrical cardioversion
 - **Paroxysmal SVT**
 - Amiodarone, procainamide, sotalol, flecainide, propafenone
 - If LV dysfunction: amiodarone/digoxin/diltiazem
 - If persists, electric cardioversion
 - **Atrial Tachycardia (AT)**
 - No electrical cardioversion

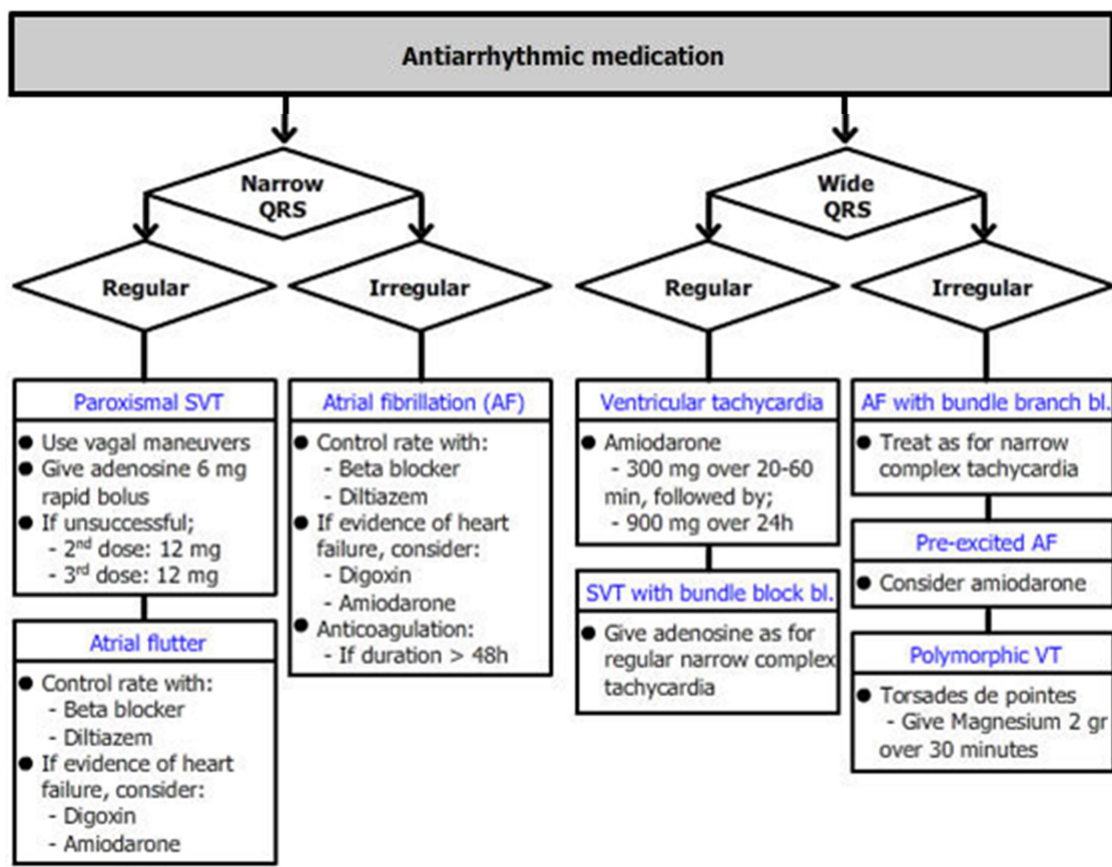
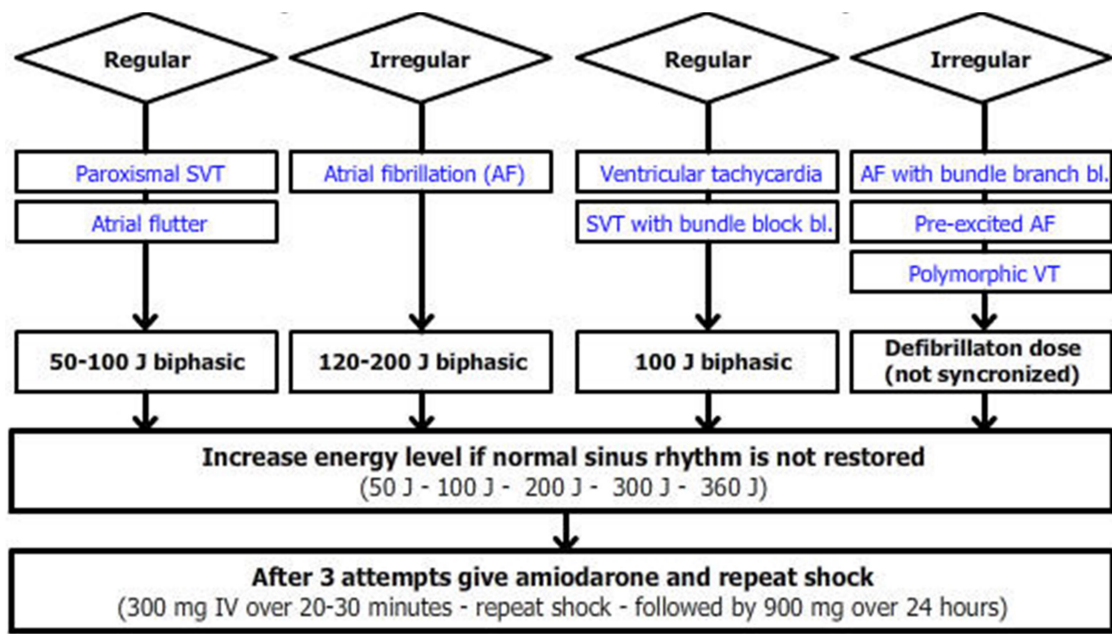
- Rate control: amiodarone/Beta blockers/Calcium channel blockers
 - If LV dysfunction: amiodarone/digoxin/diltiazem
- **AFib, or Aflutter, or non-specific unknown SVT:**
 - Rate control: if duration >48h (or unknown)
 - Beta-blockers
 - Calcium channel blocker,
 - Digoxin (if impaired LVEF <40%)
 - Amiodarone
 - Consider cardioversion if duration <48h, on anticoagulation (INR 2-3) or no clots on transoesophageal ECHO.
 - DC cardioversion, or
 - Pharmacological
 - Ibutilide/flecainide/propafenone/BB/procainamide/amiodarone
 - If duration >48h: consider delayed cardioversion
 - Echocardiogram (TEE if possible before cardioversion)
 - Anticoagulation: UFH or LMWH
 - Rate control
- **WPW**
 - Avoid adenosine, BB, CCB, digoxin
 - If <48h: electrical or pharmacological cardioversion (procainamide, ibutilide or amiodarone)

ONGOING MANAGEMENT

- **Consider**
 - Long-term rate vs rhythm control (AFib/Aflutter >48h)
 - Permanent pacing/catheter ablation
- **Further diagnostics:**
 - CHADS2 score (stroke risk, need for chronic anticoagulation)
 - Echo: LV function
 - Consider electrophysiological study

ALGORITHM





REFERENCES & ACKNOWLEDGEMENTS

-This card was developed by Authors: Benjamin Bonneton, MD; Reviewers: Ognjen Gajic, MD; Emir Festic, MD - ACC/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities. It was also reviewed by Emir Festic, MD and Courtney E. Bennett, DO in 2016.

-2012 ACCF/AHA/HRS Focused Update of the 2008 Guidelines for Device-Based Therapy of Cardiac Rhythm Abnormalities

-Adult tachycardia algorithm – Resuscitation Council (UK)

-ERC Resuscitation Guidelines-2010

-AHA Resuscitation Guidelines-2010