Junctional Ectopic Tachycardia (JET) Guidelines

Date Initiated___/___/___

Notes: (1) This pathway is a general guideline and variations can occur based on professional judgment to meet individual patient needs. (2) This is a quality improvement document and should not be a part of the patient’s medical record.

Suspected Junctional Ectopic Tachycardia
- Obtain 12 lead ECG and atrial ECG (when atrial wires present)
- Diagnosis of JET generally requires:
  -- Heart rate greater than 170 beats per minute
  -- QRS morphology similar to the sinus rhythm QRS complex
  -- Atrioventricular dissociation
  -- Ventricular rate faster than the atrial rate

-- At risk populations:
  -- Infants less than 6 months,
  -- Bypass time greater than 75 minutes,
  -- Heterotaxy
  -- Preoperative/prenatal arrhythmias

-- Surgeries with higher incidence of JET:
  -- VSD repair
  -- AV canal repair
  -- TOF repair
  -- TAPVR repair
  -- Single Ventricle operations (BT shunt and Fontan)

-- Please call cardiology to confirm rhythm is consistent with JET

---AV dissociation---

After Diagnosis of JET (in coordination with cardiology):

General Initial Management:
- Adequate analgesia and sedation (dexmedetomidine & fentanyl)
- Keep mildly hypothermic (35 – 36°C)
- Ensure patient is euvoletic with adequate RV filling
- Keep electrolytes within normal range including Mg (Mg level of > 2.5 mg/dL)
- Correct acidosis/optimize acid base status
- If possible, reduce catecholamine infusions
- Test and have pacemaker set at bedside for overdrive pacing
  - pace only at “physiologic” rates appropriate for age
  - heart rates well above physiologic rates might impair ventricular filling
- Please call cardiology if antiarrhythmics are needed

Antiarrhythmic Medications (in coordination with cardiology):

**Dexmedetomidine**

Dosing:
1. Bolus 0.5 mcg/kg IV x 1-2 times
2. Infusion 0.5 – 2 mcg/kg/hr

Mechanism of Action: \( \alpha_{2A} \) Agonist with side effect of bradycardia, decreases release of norepinephrine, increases vagal output

Precautions:
1. Have external pacemaker available for overdrive pacing

Caveats:
1. Infants often require higher dosing than older children
2. Can worsen bradyarrhythmias and third-degree heart block

**Amiodarone**

Dosing:
1. Bolus: 1 mg/kg IV over 10 min repeated to max 20 mg/kg IV
2. Infusion: 5–20 mcg/kg/min IV

Mechanism of Action: Class III Antiarrhythmic (potassium-channel blocker) – increases AP duration and prolongs refractory period of cardiac muscle

Precautions:
1. Attending present at bedside for administration
2. External pacemaker available for overdrive pacing
3. Volume/additional vasopressors for hemodynamic instability

Caveats:
1. If more than 2 boluses needed, consider infusion
2. Check baseline thyroid function (and consider q2week rechecks for infusion duration > 1 week)
3. Consider vasopressin infusion as an alternative agent to catecholamines for hypotension with amiodarone

**Procainamide**

Dosing:
1. Bolus: 5 mg/kg IV load over no faster than 10 minutes can repeat x 2
2. Infusion: 10 – 40 mcg/kg/min IV
**Mechanism of Action:** Class IA Antiarrhythmic – binds to fast sodium channels inhibiting recovery after repolarization

**Precautions:**
1. External pacemaker available for overdrive pacing  
2. Hypotension can be seen during bolus dosing  
3. Require Procainamide/NAPA levels sent STAT for titration

**Caveats:**
1. Monitor QTc prolongation with daily EKG's  
2. Can cause bone marrow suppression and lupus-like syndrome

**Esmolol**

**Dosing:**
1. No bolus dosing for post-operative patients  
2. Infusion: 50-300 mcg/kg/min IV

**Mechanism:** Class II Antiarrhythmic – β-1 adrenergic antagonist (blocks epinephrine and norepinephrine in myosites)

**Precautions:**
1. No bolus needed – rapid on/off effect  
2. Use with caution in immediate post op patient secondary to negative inotropic effects, decrease in contractility

**Caveats:**
1. Do not use if patient is requiring epinephrine or norepinephrine infusions for blood pressure management

**Overdrive Pacing:**
- Nearly all arrhythmia reduction methods will (ideally) reduce the heart rate  
- Overdrive pacing allows an increase in the heart rate with AV synchrony, which most often increases cardiac output  
- Physiologic appropriate settings should be used for overdrive pacing  
- Many patients will tolerate AAI pacing when AV conduction is not delayed. If there is heart block, DDD pacing might be required. *Please consult cardiology to assist with external pacemaker settings.*

** Extracorporeal support:**
- Please contact CT surgery immediately for hemodynamically significant JET or JET which is NOT responding to amiodarone

**References:**


Last Updated: 11/12/2020 Pathway owner: Rebecca Smith, MD – RLSmith@unc.edu