PEM GUIDE – SUPRAVENTRICULAR TACHYCARDIA

INTRODUCTION

Re-entrant narrow complex tachycardia with HR usually > 220/min in infants and young children; > 180/min in adolescents and adults.

CLINICAL FINDINGS

SVT vs SINUS TACHYCARDIA		
	SVT	**Sinus Tachycardia**
Infants	Non-specific vague history Irritability, sleepiness Poor feeding Decreased activity	Dehydration, hypovolemia Fever Pain Stress Medications / Ingestions
Children	Sudden onset Palpitations Chest discomfort Anxiety	As above
Characteristics	Abrupt onset / termination Steady HR No beat-to-beat variability P waves may be absent	Warm-up and cool-down HR changes with activity Beat-to-beat variability P waves are present

STABLE VS UNSTABLE	
Stable	**Unstable**
Pink skin Warm extremities Normal CR Normal peripheral pulses Normal mental status No chest pain / signs of CHF Normal systolic BP	Pallor Cool extremities Delayed CR ↓ / absent peripheral pulses Altered mental status Chest pain / CHF Hypotension

MANAGEMENT - STABLE SVT

1. Assure ABC's are normal
2. Monitor patient – continuous cardio-pulmonary monitoring
3. 12-lead EKG
4. Perform vagal maneuvers
    a. Valsalva – forced expiration against a closed glottis
    b. Diving reflex – Apply a bad filled with ice and water to the forehead, eyes and bridge of the nose for 10-15 seconds
        1. Do not immerse in ice water due to the risk of aspiration
        2. Do not impede respirations
    c. Carotid massage – Has not been studied and therefore is not recommended in children < 10 years
    c. Eye globe pressure is contraindicated due to the risk of retinal detachment
5. Cardiology Consultation
6. Pharmacologic Cardioversion
    a. Adenosine
        1. Children - 0.1 mg/kg (max of 6 mg) rapid IV push
           If no effect: double dose – 0.2 – 0.3 mg/kg (max of 12 mg)
        2. Adolescents / Adults – 6 mg first dose, 12 mg subsequent doses

        Push Adenosine fast, follow immediately with 5-10 cc rapid NS flush
        Due to its short half-life it is recommended that adenosine be administered rapidly through a stopcock system so that a flush can be administered immediately. If needed, IO line can be used. If a response is not seen within 20 seconds then it did not work.

        While attempting vagal maneuvers and adenosine, continuous rhythm strip is necessary: To document rhythm conversion to sinus

        May serve diagnostic if not therapeutic purpose – Adenosine causes transient AV-block and may unmask 1:1 conduction if the underlying rhythm is atrial flutter or atrial fibrillation
    b. Additional medication options (See table below)
7. Electrical Cardioversion
    a. Synchronized cardioversion – 0.5-1 J/kg initially then 2 J/kg may be used

        In an awake patient sedation should be considered – Versed 0.05 – 0.1 mg/kg, however it should not delay cardioversion.

MANAGEMENT - UNSTABLE SVT

1. Assess ABC's
2. While preparing for emergent therapeutic intervention, but not instead of – vagal maneuvers may be considered.
3. If IV is already in place, or if one can be placed quickly (1-2 min) – Adenosine as above
4. If IV access cannot be established quickly, or patient is deteriorating, or Adenosine is not effective – synchronized cardioversion – 0.5-1 J/kg initially then 2 J/kg may be used

   In an awake patient sedation should be considered – Versed 0.05 – 0.1 mg/kg, however it should not delay cardioversion.
5. A number of pharmacologic options may be considered in the patient with refractory SVT. Selection of medications should be guided by cardiology consultation.

MEDICATION SELECTION IN ACUTE SVT			
Medication	Bolus	Infusion	Comments
Adenosine	0.1 mg/kg (Max 6 mg) 0.2 mg/kg (Max 12 mg) Rapidly	None	
Amiodarone	5 mg/kg over 20-60 min	5-10 mg/kg/day	
Digoxin	5 mcg/kg (infants) 10 mcg/kg (children)	None	Contraindicated > 1yr with pre-excitation (WPW)
Esmolol	100-500 mcg/kg over 1 min	200 mcg/kg/min	
Procainamide	15 mg/kg over 30-60min Max 100mg/dose	20-80 mcg/kg/min	
Verapamil	0.1 mg/kg over 2 min	1-7 mcg/kg/min	Contraindicated < 1 year

MANAGEMENT - WIDE COMPLEX SVT (WITH ABERRANT CONDUCTION)

Any wide-complex tachycardia should be treated as ventricular in origin
Immediate cardioversion or Amiodarone or Procainamide.
Only a small percentage of pediatric SVT's have aberrant conduction (i.e. in children with pre-existing BBB) and are exception rather than the rule.