Foundations Frameworks

Approach to Tachydysrhythmias

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1. **Stable vs Unstable:** this is the first question you must ask for any tachy or bradydysrhythmias
    a. SBP < 90, altered mental status, poor perfusion, CP/SOB = unstable
    b. Unstable: synchronized electrical cardioversion
        i. 100-200 J biphasic or 360 J monophasic
        ii. Consider providing procedural sedation as situation allows
2. **Evaluate for P waves:**
    a. **If normal P waves present,** this is likely sinus tach
        i. Treat sinus tach as indicated with fluids, identify and treat underlying cause
3. **Narrow vs Wide *and* Regular vs Irregular**
    a. **Wide (> 120 msec)**:
        i. **Regular: Treat as V Tach** (rather than SVT with bundle branch block)
            1. Treatment
                a. Synchronized Electrical Cardioversion: sedation and cardioversion, V-tach has a propensity to degenerate to V-fib
                b. Could also consider medical treatment if stable
                    i. Procainamide - 17 mg/kg total dose given (12 mg/kg if renal failure)
                    ii. Amiodarone - 150 mg over 10 min (15 mg/min), followed by 1 mg/min drip over 6hrs (360 mg total)
                    iii. Lidocaine 1-1.5 mg/kg IV q5 min, repeat prn up to 300 mg/hr
            2. Alternative diagnoses in suspected V Tach
                a. Consider severe acidosis, hyperkalemia, and TCA/Na channel blocker toxicity
                b. Especially in slow V-tach (rate close to 100-120)
                c. Give Ca and Bicarb
                d. Lidocaine, Amiodarone, Procainamide all worsen Na channel blockade – avoid using these when not true V tach
        ii. **Irregular**: Likely A fib with bundle branch block, but beware of **A-fib with WPW** accessory pathway
            1. A-fib w/ WPW: a-fib sends rapid signals down through WPW pathway
            2. Can cause rates of 200 or higher and can degenerate into V-fib
            3. Look for wide, irregular rhythms with very fast rates (> 200 or more) with a changing morphology (from combinations of nodal and accessory signals activating the ventricles)
            4. Treatment of A-fib with WPW: synchronized electrical cardioversion vs procainamide (1 gm infused over an hour), avoid AV nodal blockers as this can enhance conduction through accessory pathway

b. Narrow (< 120 msec)

i. Regular

1. Atrial Flutter

a. Look for flutter waves and a consistent, non-variable HR in the 130-150's
b. Treat similarly to atrial fibrillation with rate vs rhythm control based on time of onset and anticoagulation
c. Can use trial of adenosine to slow down and show flutter waves if hard to distinguish SVT vs Aflutter

2. AVNRT

a. Retrograde P-waves before, after, or buried in QRS; HR typically 160-180's
b. Vagal maneuvers
c. Adenosine 6 mg IV push, can give repeat doses of 12 mg
    i. Need ≥ 20G IV in an antecubital vein
    ii. Do not push through central line
d. IV diltiazem or beta blocker if above unsuccessful
e. Synchronized electrical cardioversion if unstable or above unsuccessful

3. **Sinus Tach**: may be hard to see P-waves, look for variable rate, improvement in rate with fluids, find and treat underlying cause

ii. Irregularly Irregular: Atrial Fibrillation (vs A-flutter with variable conduction)

1. Rate vs rhythm control
2. Rhythm control: Time of onset < 48 hr (or conservatively 12 hr) or already anticoagulated -> consider chemical vs electric cardioversion
    a. Procainamide 1 gm over 1 hour
    b. Electrical cardioversion with procedural sedation
3. Rate control: beta blocker vs calcium channel blocker
    a. Metoprolol 5 mg IV up to 3 doses; 25 mg IR or 50 mg ER to transition to oral therapy once HR controlled
    b. Esmolol: 0.5 mg/kg over 1 min bolus IV, 50-300 mcg/kg/min drip
    c. Diltiazem: 0.25 mg/kg bolus, 5 mg/hour drip
    d. Amiodarone: 150 mg over 10 min, can repeat dose at 1 hr if HR not controlled; maintenance infusion 1 mg/min for first 6 hrs, 0.5 mg/min for additional 18 hrs
    e. No definitive evidence that one is better than other, consider using home medication type (CCB or BB) in PO/IV form
    f. Consider anticoagulation in these patients if they are high risk for stroke CHADSVASC2 score (can also discuss anticoagulation with cardiologist)

References:

- Adams, J et al. Emergency Medicine: Clinical Essentials, Second Edition. Tachydysrhythmias, pp. 497-513. 2013.
- Prutkin, JM. Overview of the acute management of tachyarrhythmias. Last updated: Sep 28, 2016. Uptodate.com
- Herbert, M, Mason, J, Swadron, S. EMRAP. C3 – Tachyarrhythmias. July, 2017. emrap.org