

# Cardiac Arrhythmia in the Young

## practical considerations

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# Clues/Red flags in PE or Hx

- Heart failure symptoms
- Structural Heart Disease
- Midline incision on the chest
- Stroke
- Drug ingestion
- Exercise-related
- FHx (sudden death at young age)



# Tachycardia and abnormal myocardium

- In a child with Cardiomyopathy or palliated structural heart dz or unrepaired structural heart disease (esp. w single ventricle physiology), V-tach, even for short periods can be disastrous.




# Tachycardia Diagnosis

- The only ways to diagnose a rhythm problem:
  - 1) Feel the pulse.
  - 2) Place the patient on the monitor.
  - 3) 12 lead ECG



# Questions you need to ask

- Pulse vs no pulse
- Stable vs non stable
- CHD vs no CHD (if operated CHD, palliated or repaired?)
- Fast vs slow QRS; A-V ratio
- Wide vs narrow QRS ( $\geq 90$  msec)
- Different or similar to the baseline ECG
- Age, duration of symptoms, other medical problems



# Questions you need to ask

## All you need to know

- No pulse → CPR
- Unstable → Electricity +/- CPR
- Access



# Important Considerations about VT

- VT can occur @ any age.
- Clinical consequences of VT can be much more serious than SVT (degeneration into VF, underlying myocardium is more likely to be abnormal)
- Little harm is done by treating SVT with a wide QRS in an unstable/sick pt according to the VT protocol; the converse is NOT true.



# Important Considerations about VT ECG clues

- Any wide QRS (for age)
- change in QRS morphology or axis should be considered VT until proved otherwise.
- ST/T changes
- Always try to locate previous ECG and compare with the current one.





# ECG hallmark of VT

- The most important ECG sign of VT:  
A-V dissociation (p's marching through)  
With slower atrial rate (AV ratio  $< 1$ )



# VT-Other things

drugs; drugs, drugs, ...

- Ephedra (herbal supplement; kids may use it to boost athletic performance or for dieting)
- Ephedrine
- Cocaine
- Household products that kids inhale to get high
- Methadone, Methamphetamine “ecstasy”
- TCA, Anti arrhythmia drugs



# VT-Other things

- Low temperature
- Electrolytes (Mg, K, Ca)

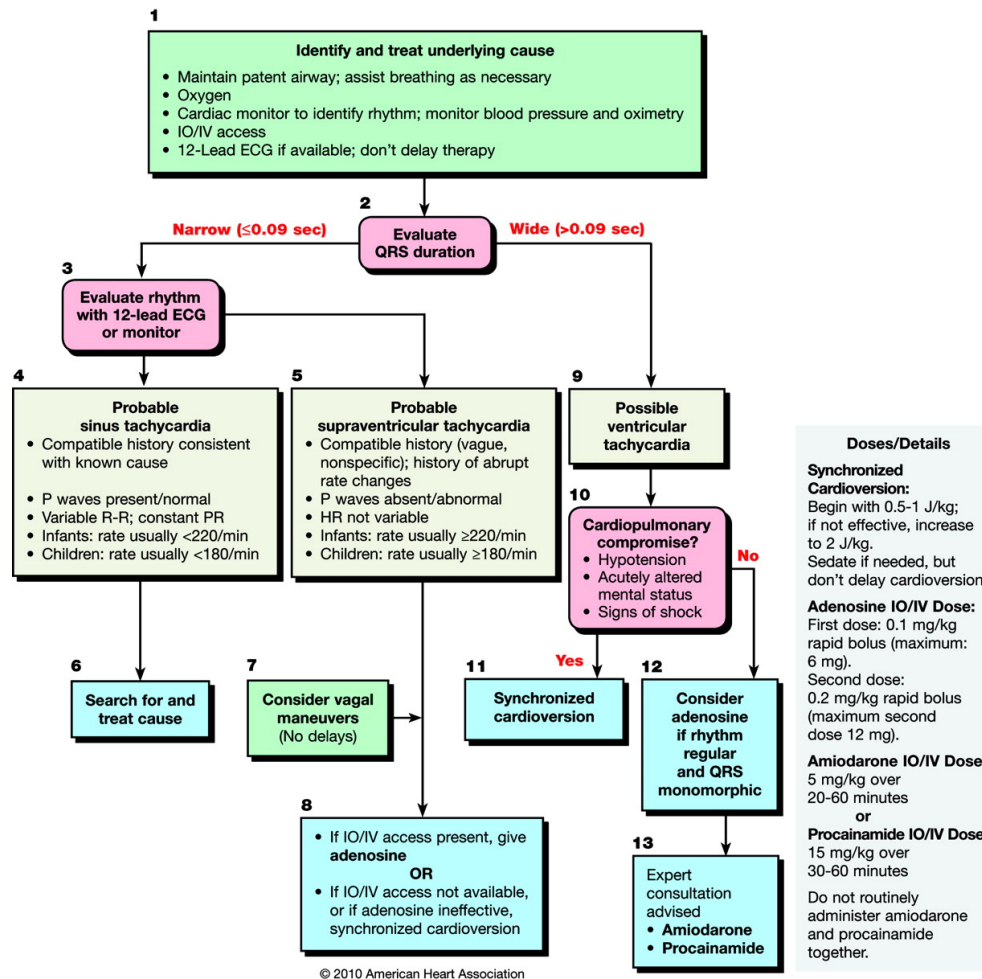


# VT-Other things

- Fixed HR is never normal.
- Always take exercise-induced syncope, or syncope with family hx of sudden death, *very* seriously.
- Brain is the most important monitor of the adequacy of oxygen delivery.

# PALS Tachycardia Algorithm.

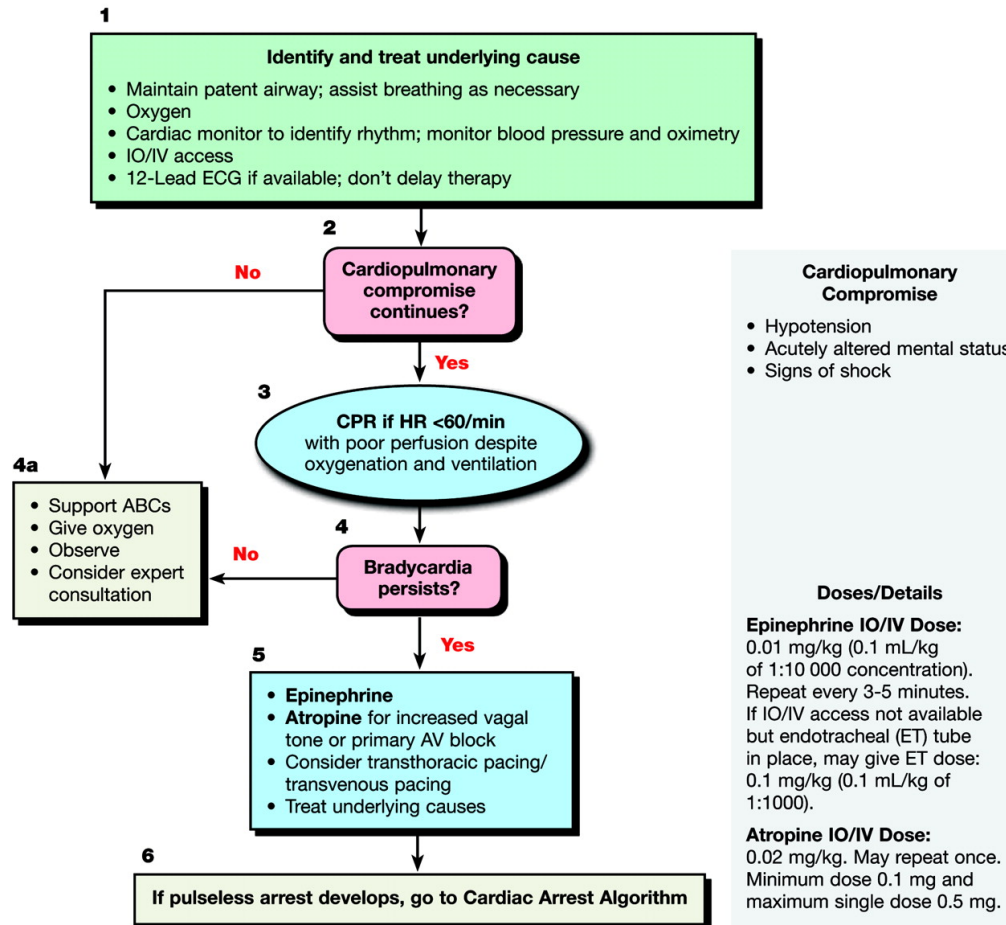
## Pediatric Tachycardia With a Pulse and Poor Perfusion



Kleinman M E et al. Circulation 2010;122:S876-S908

# PALS Bradycardia Algorithm.

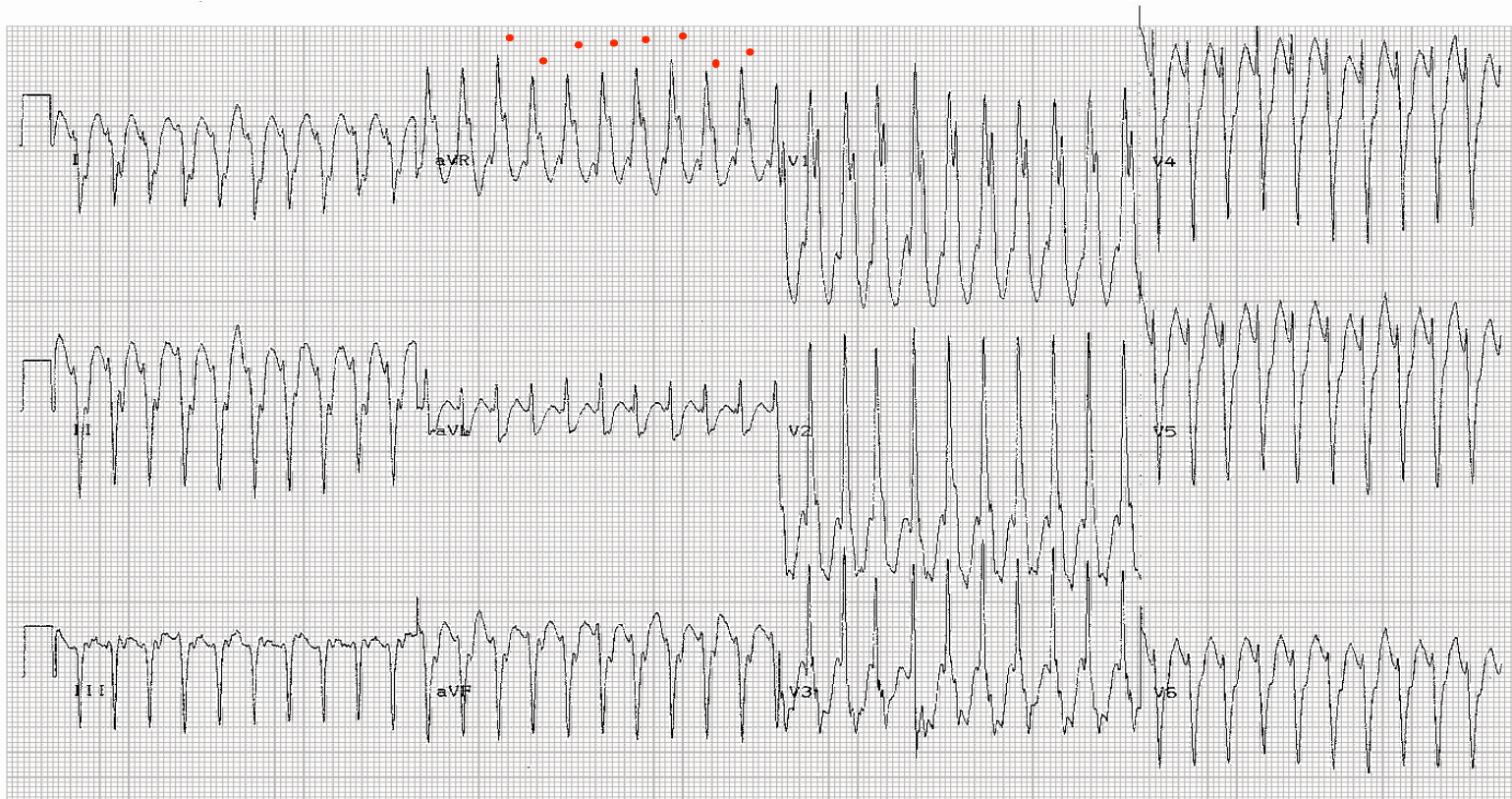
## Pediatric Bradycardia With a Pulse and Poor Perfusion



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# 1 yr. o. boy w fever and collapse



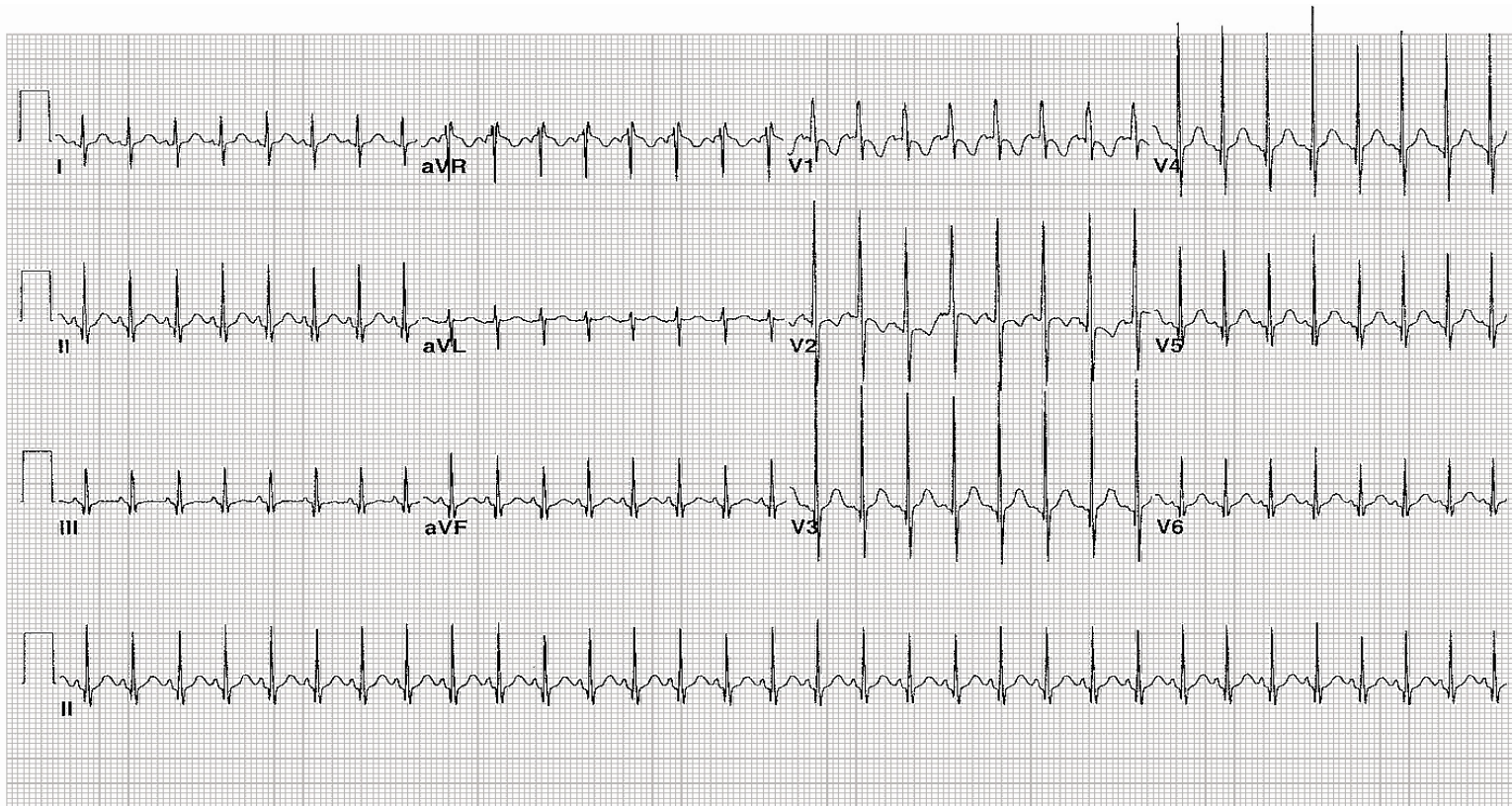


# 5 yr old boy with cardiac arrest

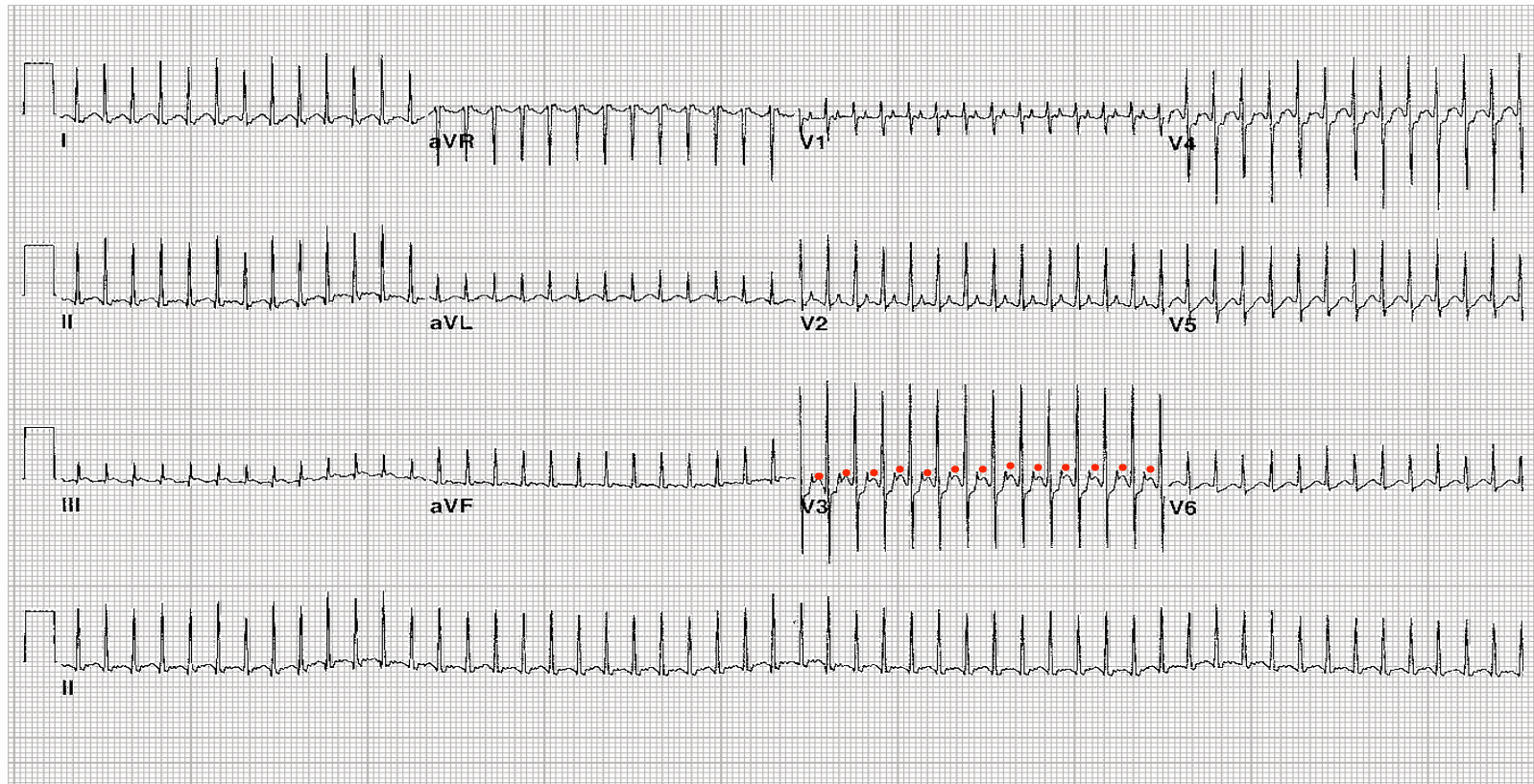




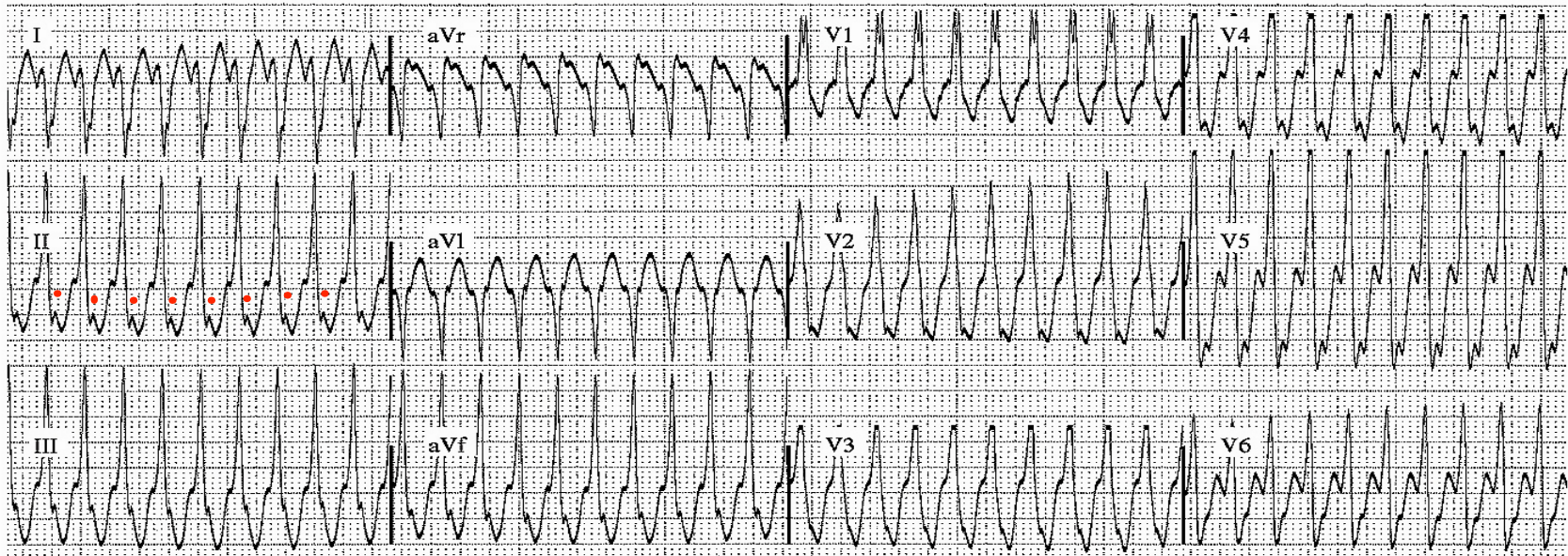
# 3-mo-old infant with fever, irritability



# 6-day old infant w irritability and vomiting



# 3-yr-old boy , Hx of WPW, on Dig



# Previous pt at 2 wk of age



# 15-yr old large male who passed out at the football game; now dizzy

ECG in sinus next slide



# ECG during sinus rhythm of the pt seen on the preceding tracing

