



Telemetry Workshop 2

Winter Arrhythmia School

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Goals

- To make tachycardia “less scary”
- To give you an approach to tachycardia
- Pearls of interpreting EKG and telemetry strips



Disclosure

- No financial conflict of interest



Tachycardia

- Definition
 - $HR > 100\text{bpm}$
 - Or Cycle Length $< 600\text{msec}$
- Narrow complex tachycardia
 - $QRS < 120\text{msec}$
- Wide complex tachycardia
 - $QRS > 120\text{ msec}$



How do you calculate tachycardia cycle length?

- A. Divide 60,000 by the PP or RR msec
- B. Divide 100,000 by the PP or RR msec
- C. Divide 120,000 by the PP or RR msec



Narrow Complex Tachycardia

What are the questions to ask?

- Is the rhythm regular or irregular?
- Is there P with everything QRS or is P > QRS?
- How did the tachycardia start, with PAC or PVCs?
- How did the tachycardia terminate, with P or QRS?



Classification - SVT (supraventricular tachycardia) can be divided into 2 major types:

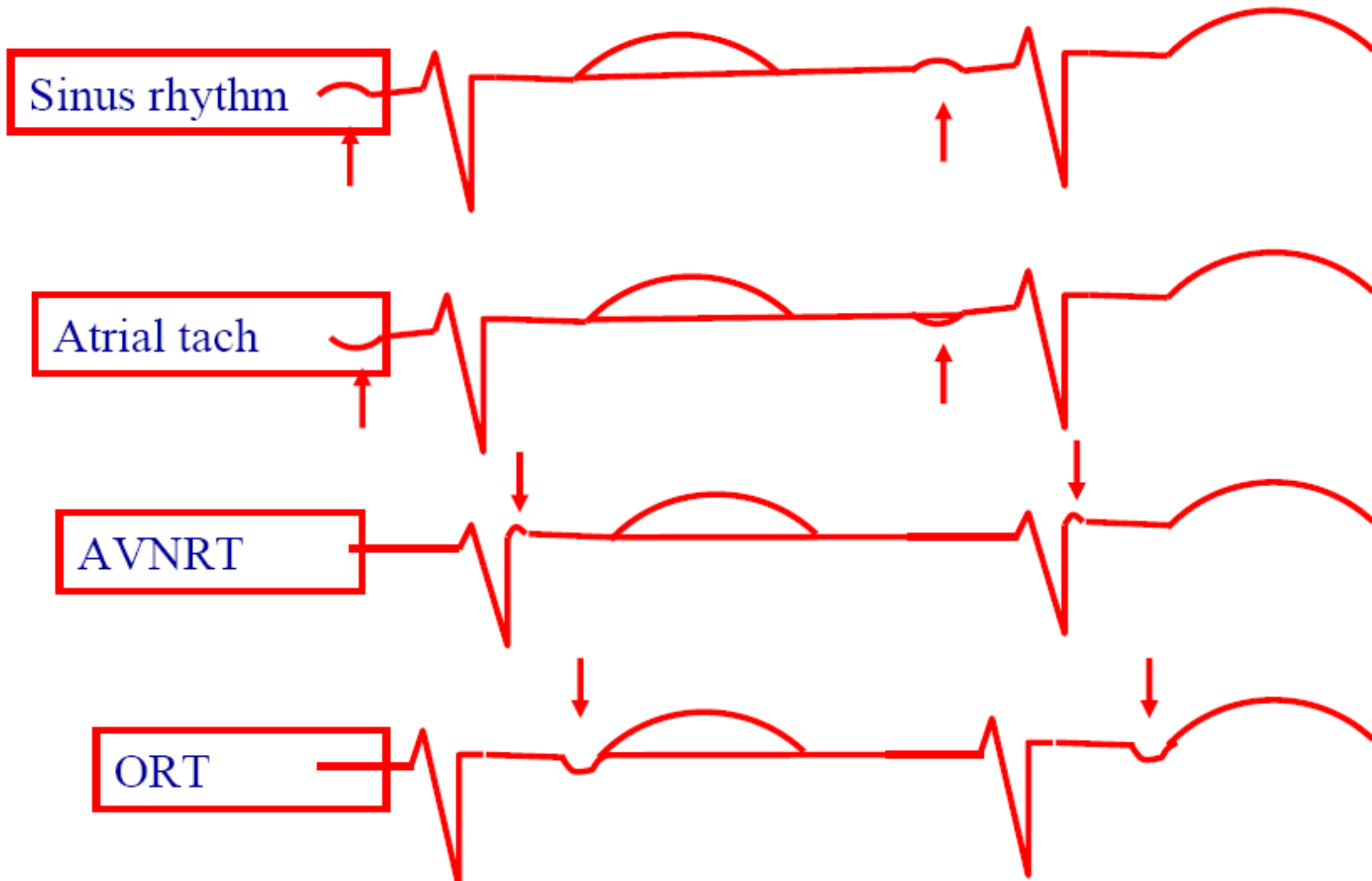
Short RP tachycardia

- (p wave is $< 50\%$ of R-R interval, < 100 msec of preceding QRS)
- Typical AVNRT (slow/fast)
- Atypical AVRT (ORT)
- Atypical Atrial tachycardia

Long RP tachycardia

- (p wave is $> 50\%$ of R-R interval, > 100 msec of preceding QRS)
- Atypical AVNRT (fast/slow)
- Typical AVRT
- Atrial tachycardia
- PJRT (posterior septal)
- Junctional tachycardia

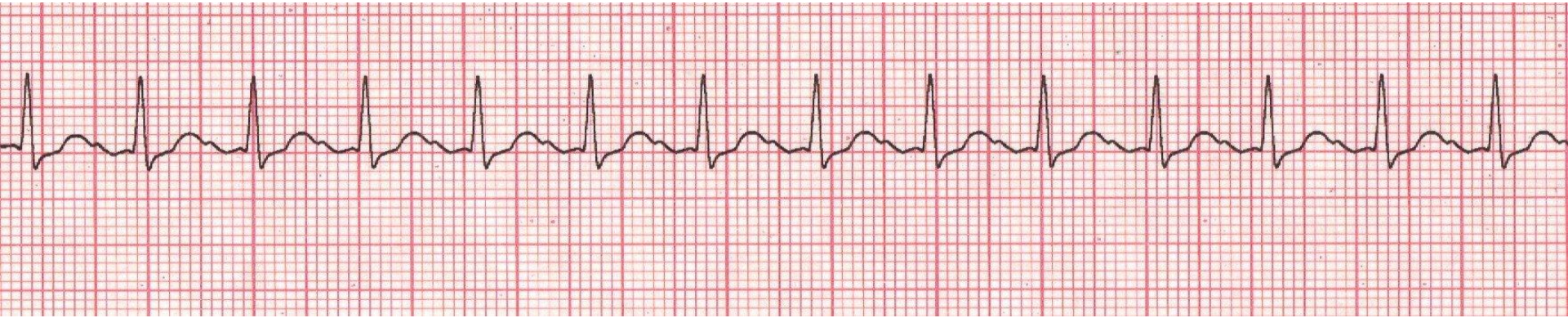
RP Relationship



- Definition - (p wave is $> 50\%$ of R-R interval, > 80 msec of preceding QRS)



Sinus tachycardia



- There is one P with one QRS i.e. 1:1 AV relationship
- Regular rhythm



Is sinus tachycardia

- A. Short RP tachycardia
- B. Long RP tachycardia



Atrial Flutter



- More P then QRS, 3:1, 4:1 ratio
- Regular Rhythm
- Saw tooth appearance i.e. Flutter Waves

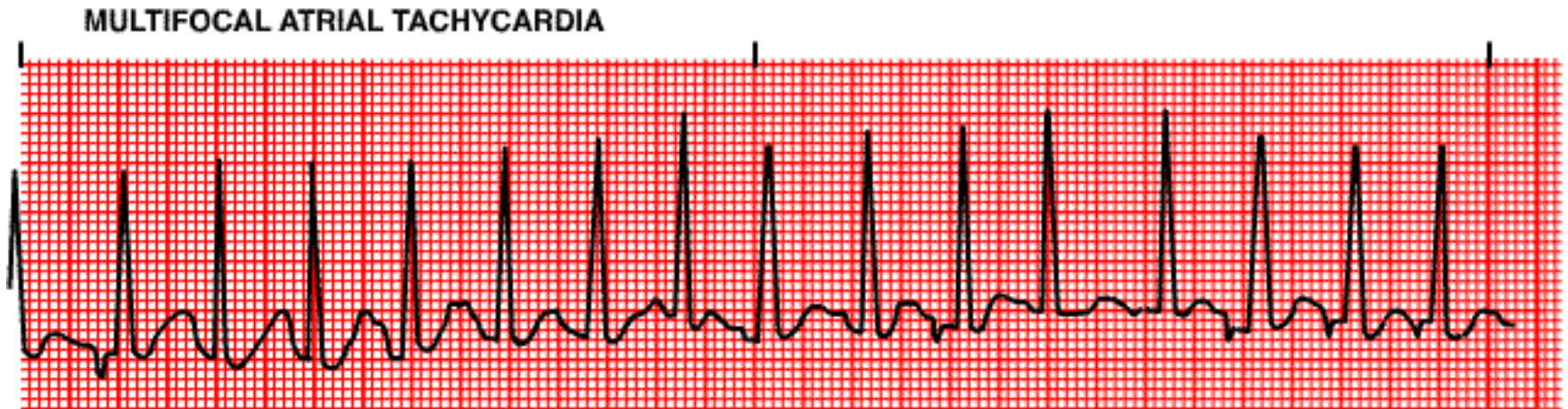


Atrial Tachycardia



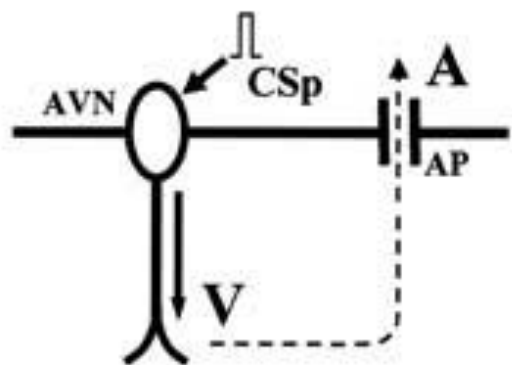
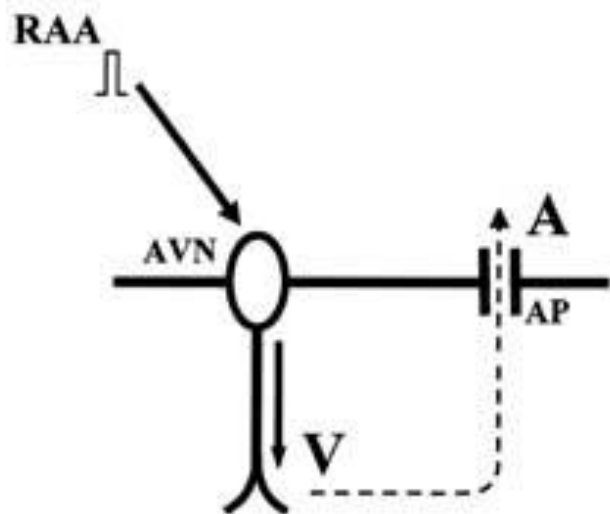
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- P before QRS. (may have different p morphology)
 - May be indistinguishable from sinus tachycardia
 - Usually abrupt onset and offset (as opposed to gradual with sinus tachycardia)

Multifocal atrial tachycardia

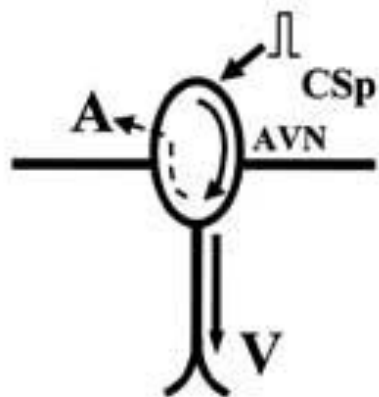
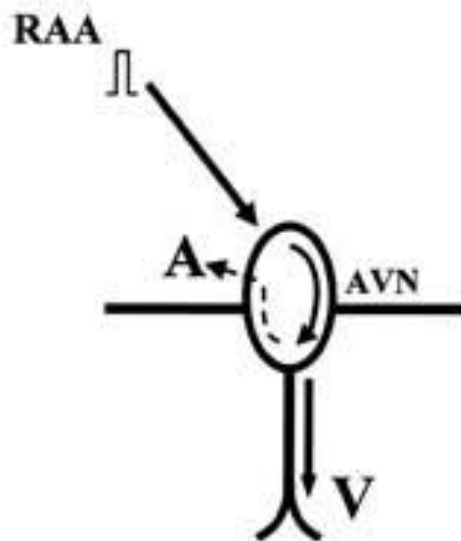


- One P wave with one QRS
- Irregular rhythm
- Varying p wave morphology and PR segments
- Usually Seen in patients with lung disease

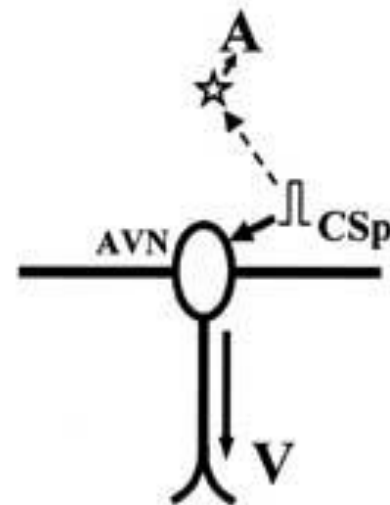
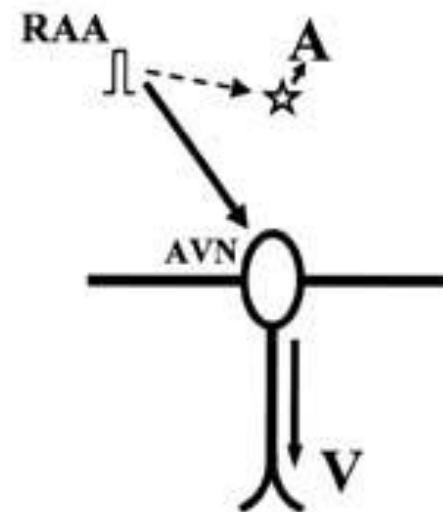
ORT



AVNRT



AT



Questions?



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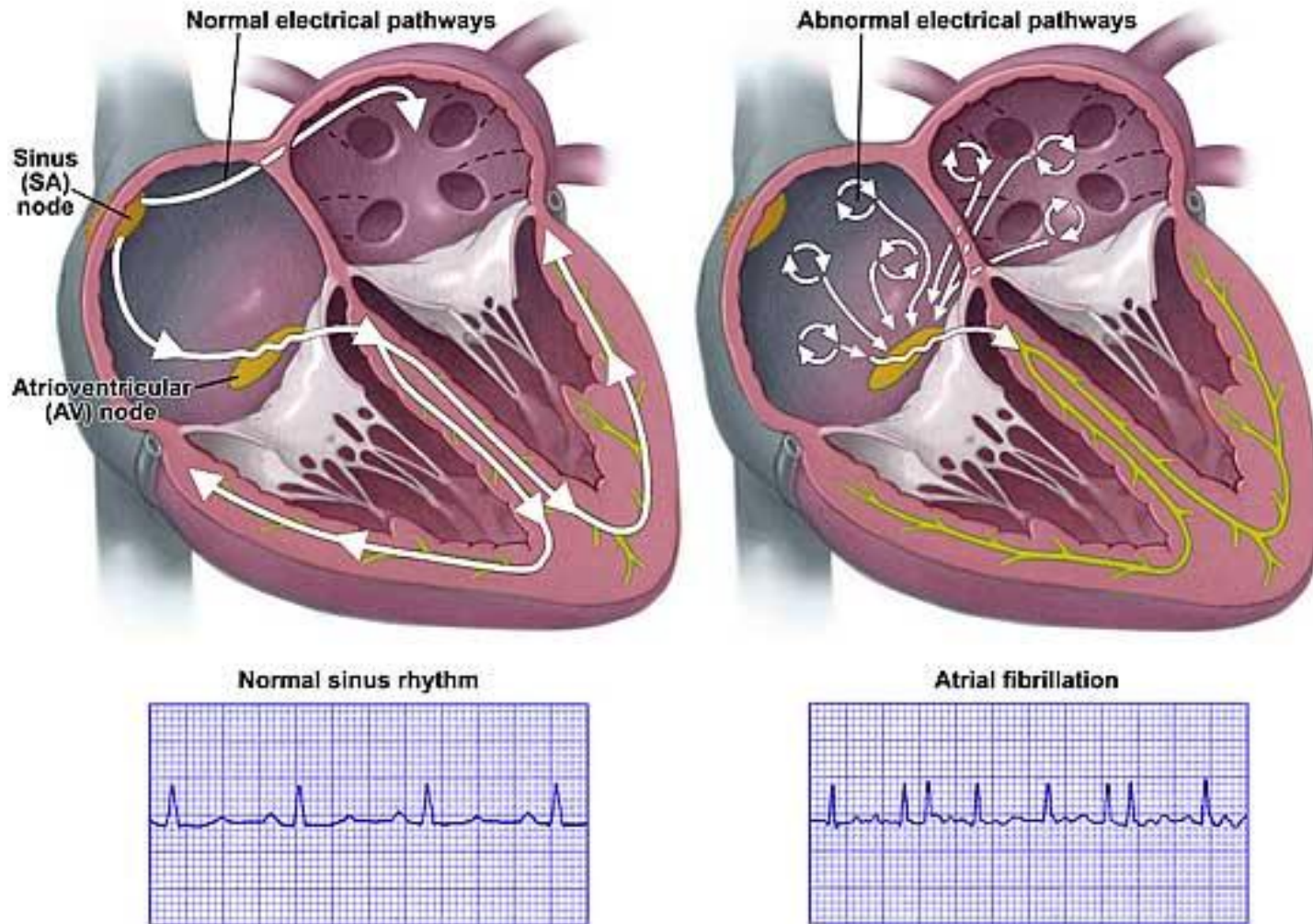


Atrial fibrillation



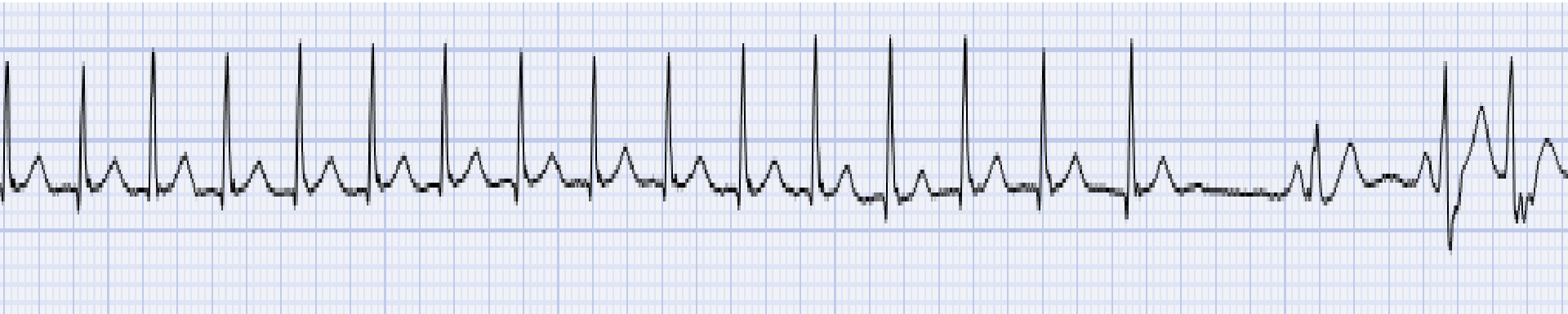
- No clear visible P waves
- Irregular irregular rhythm

Atrial Fibrillation





Supraventricular tachycardia



- Narrow complex, regular
- Starts and stops suddenly, usually with PAC
- May see inverted p waves in the ST segment or T wave
- P waves may be invisible



Narrow Complex Tachycardia

Regular

P before QRS:

Sinus tachy
Atrach
Aflutter with 1:1 AV

No p wave:

SVT
Atrach
?very fast AFIB

P>QRS:

Aflutter

Irregular

Irregularly Irregular:

- Afib
- Multifocal Atrach

Regularly Irregular:

- Aflutter with variable response
- Atrach with var response

Questions?

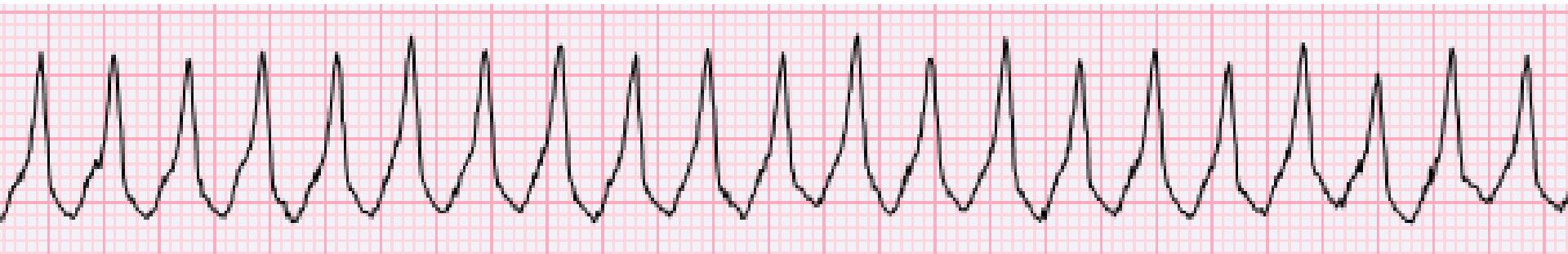
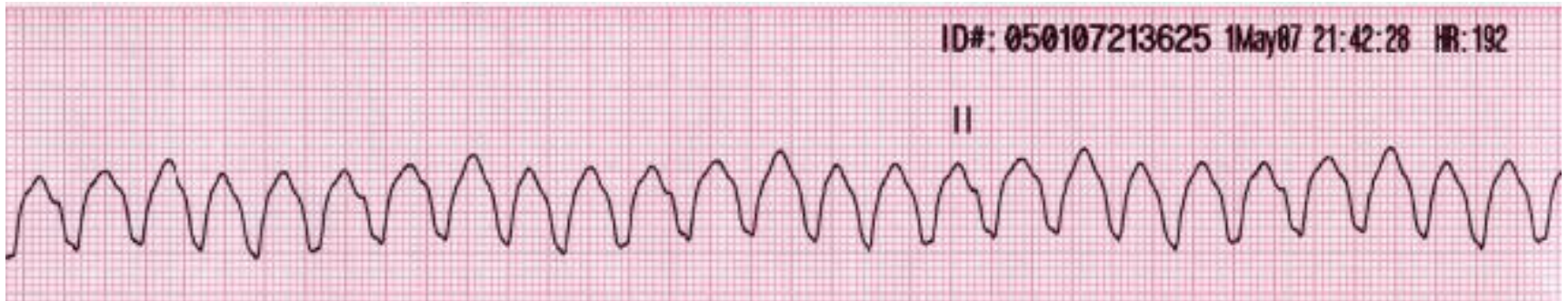




WIDE COMPLEX TACHYCARDIAS



Ventricular tachycardia



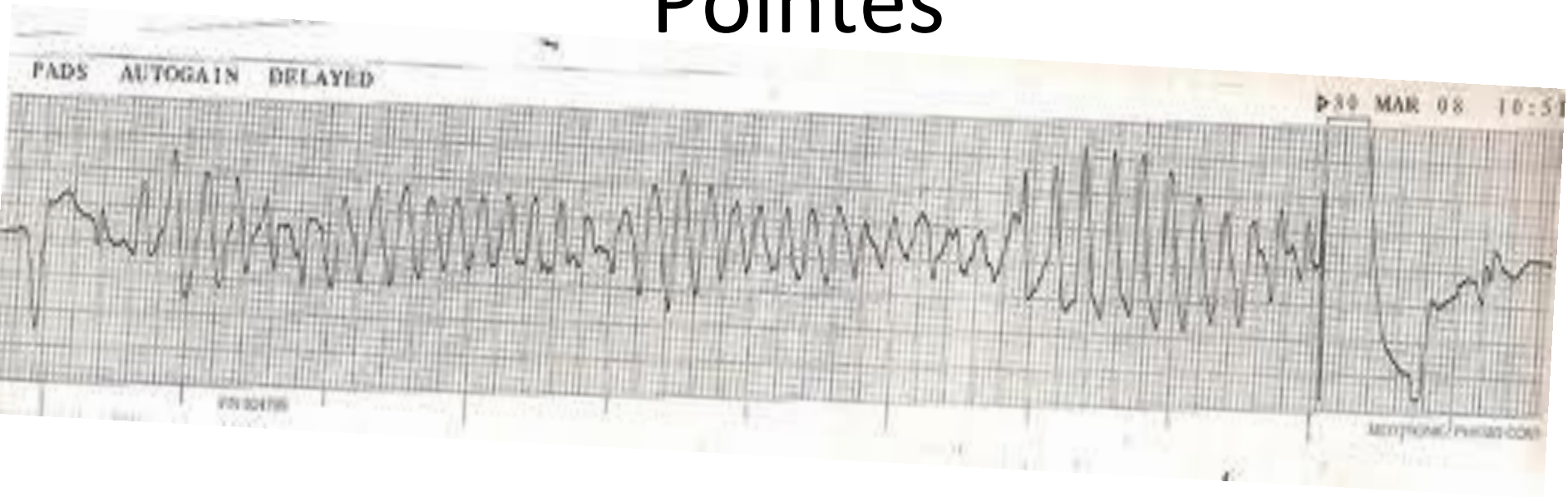


Ventricular tachycardia



- .Wide complex tachycardia
- .May be monomorphic or polymorphic
- .Usually preceded by PVC
- .Look for more QRS then P

Polymorphic VT/Torsade de Pointes



- . Classic pattern of “twisting” of QRS in an axis
- . Can be seen with electrolyte abnormalities- Hypo K, Hypo Mg or Long QT syndrome
- . Typical onset- bradycardia, long R-R interval followed by premature ventricular complex (PVC)



SVT with Aberrancy

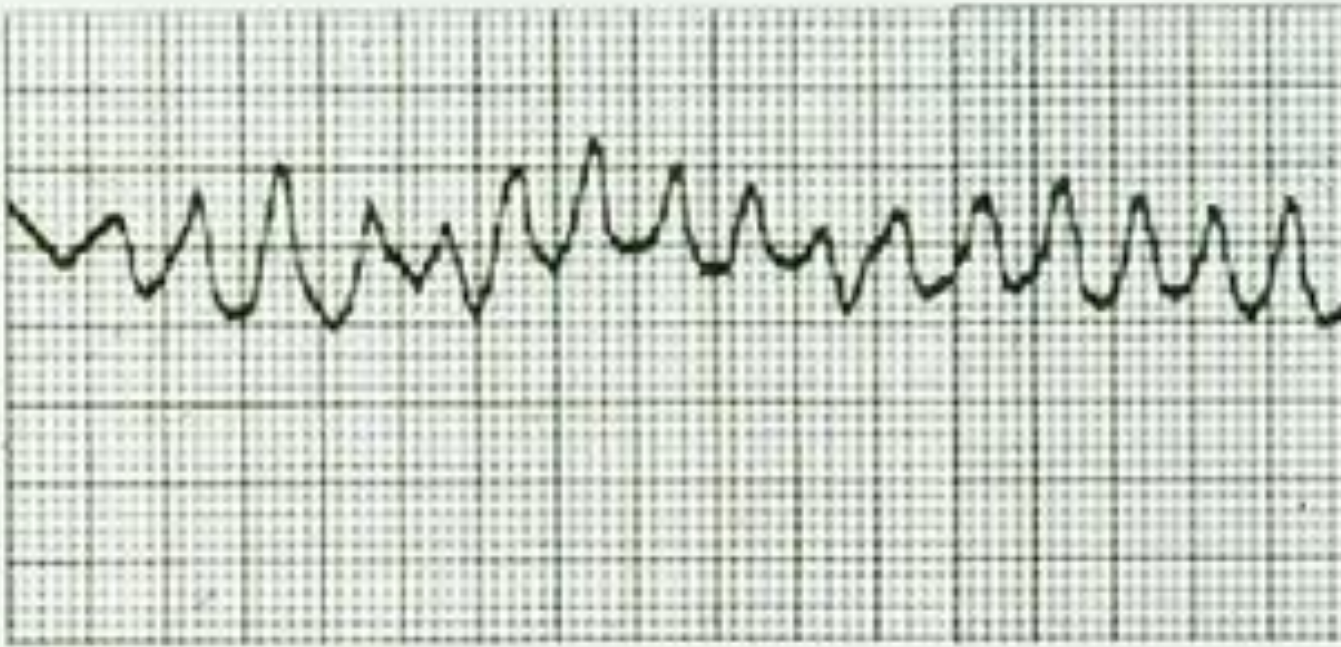
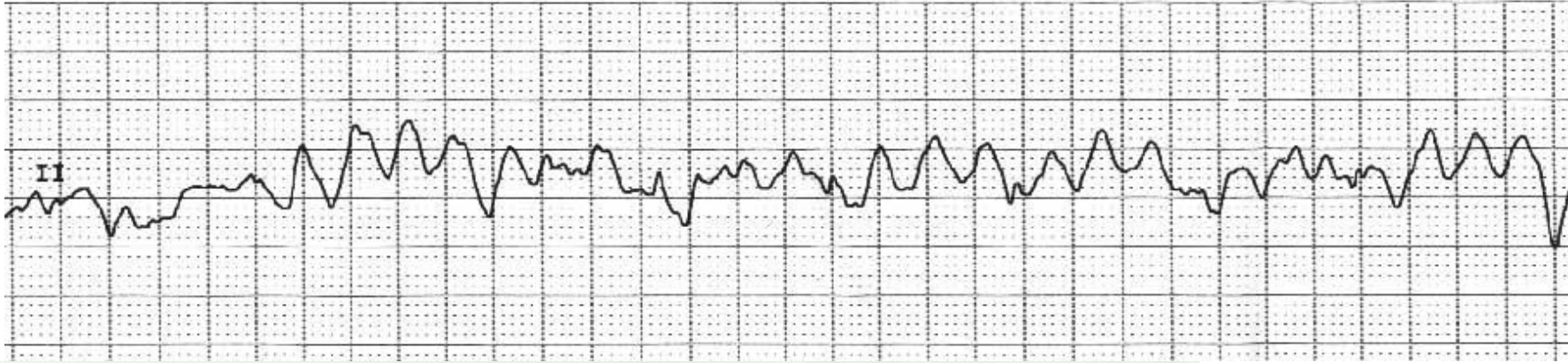
▼ Initial Rhythm



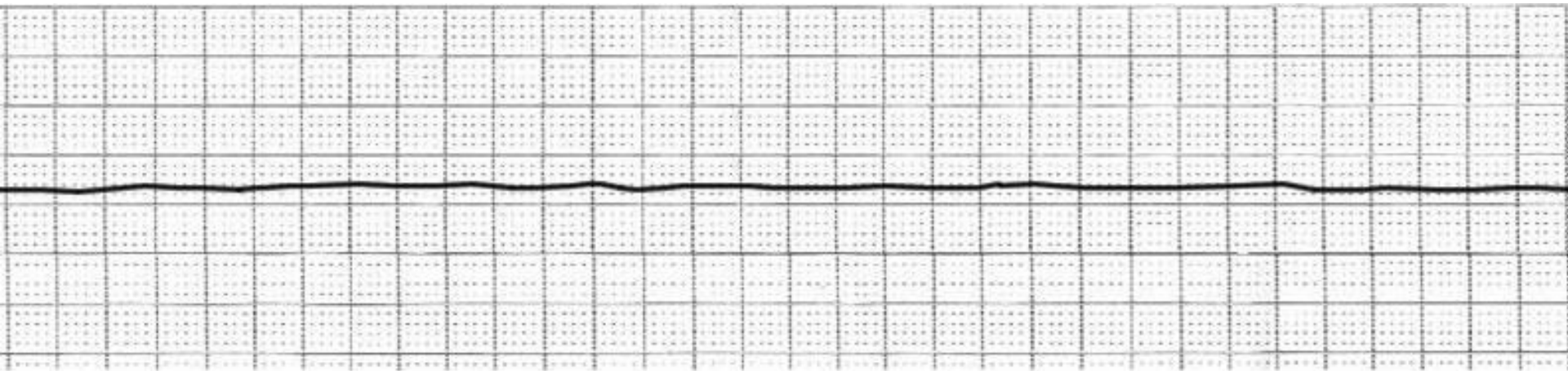
- .SVT with native bundle branch block or rate-related aberrancy
- .May be difficult to distinguish VT from SVT with aberrancy even with most skilled Electrophysiologists



Ventricular Fibrillation



- No clear visible P
- Very fast
> 300 bpm



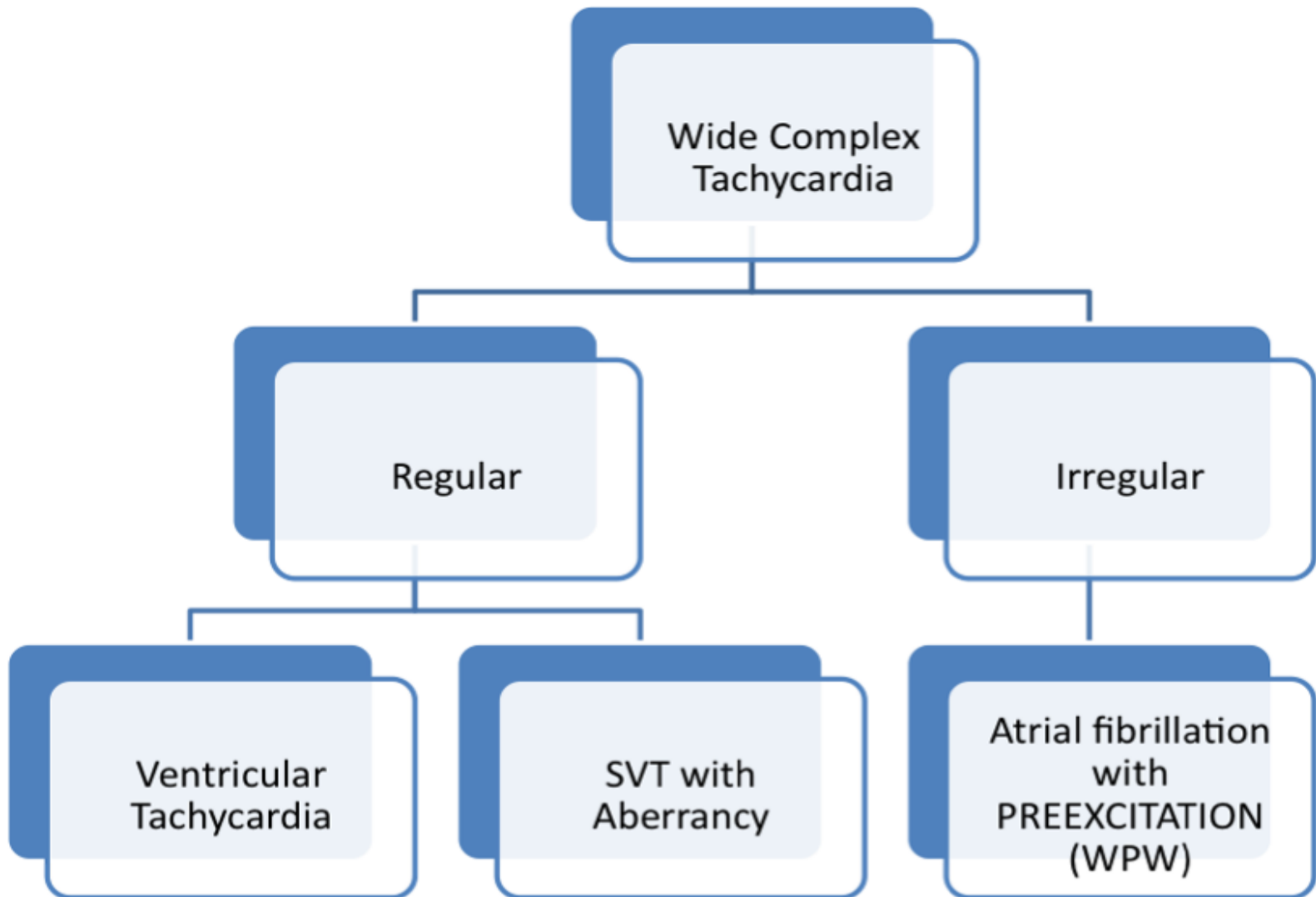
** This may not be ASYSTOLE

.ALWAYS check that leads are properly put on

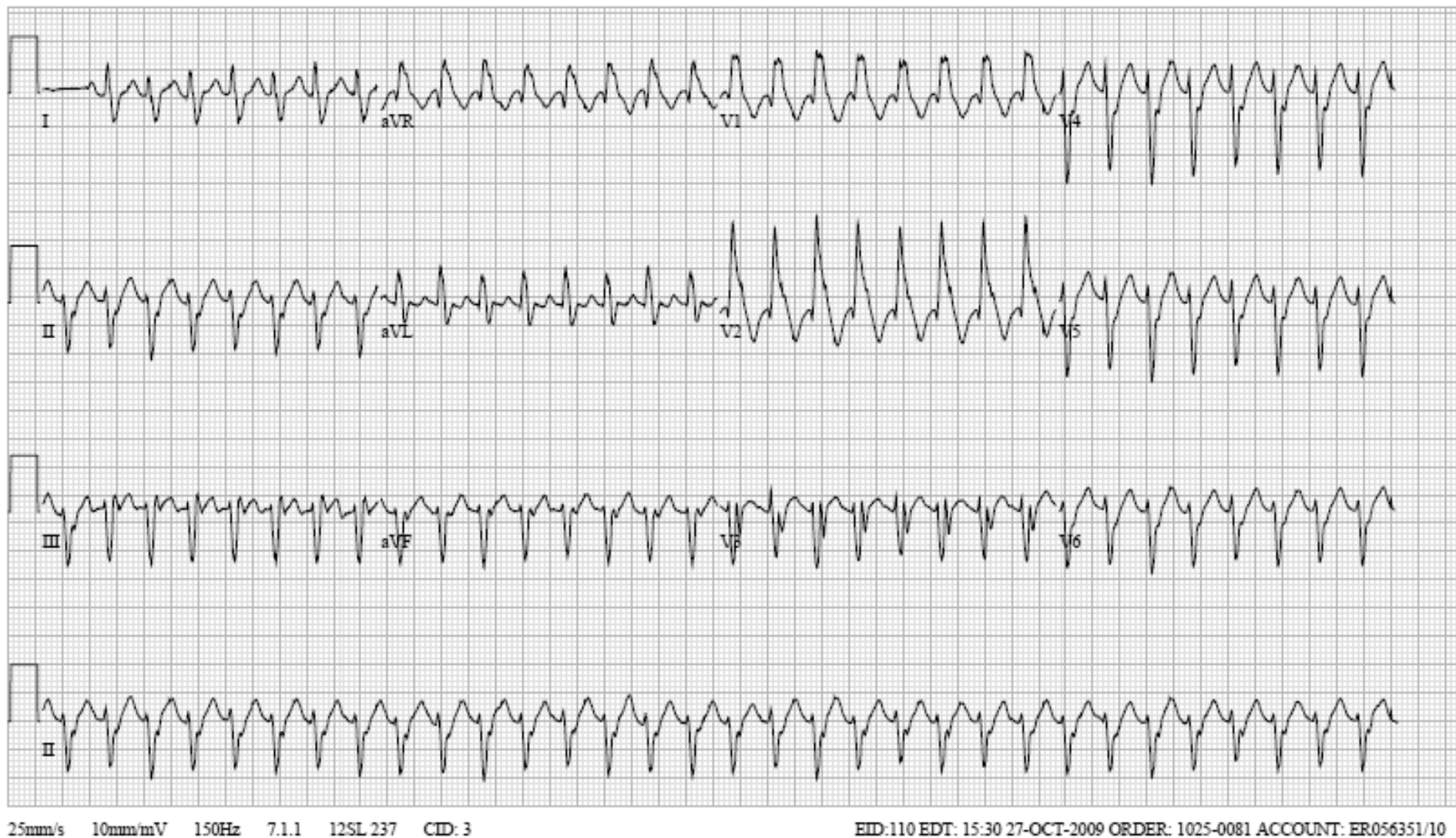
.ALWAYS check gain is not too low!




Wide Complex tachycardia



Case – VT or not VT



Diagnosis – Fascicular VT / Belhassen
VT



Bonus question - why is this VT has narrow QRS?

- A. It is close to the left anterior fascicle of the left bundle
- Because patient has normal LVEF
- I don't know



Questions ?

