Tachycardia

EMS CONSORTIUM

A story

- 37 yo male biba. Found at home, family worried. Altered, reported 2 day bender on cocaine. Doesn’t remember eating or drinking anything. No known past medical history other than cocaine use.
- Vitals 92/66 HR 170
- Patient received 500cc of fluid, adenosine and was shocked x2 prior to arrival for his tachycardia…

Before you check out because well, EKGS…

THERE IS A LOT TO TACHYCARDIA THAT GOES WITH AN EKG

ITS ALWAYS GOOD TO BE AWARE OF THE NEXT STEP

THE MORE THINKING PROVIDERS ON SCENE THE BETTER

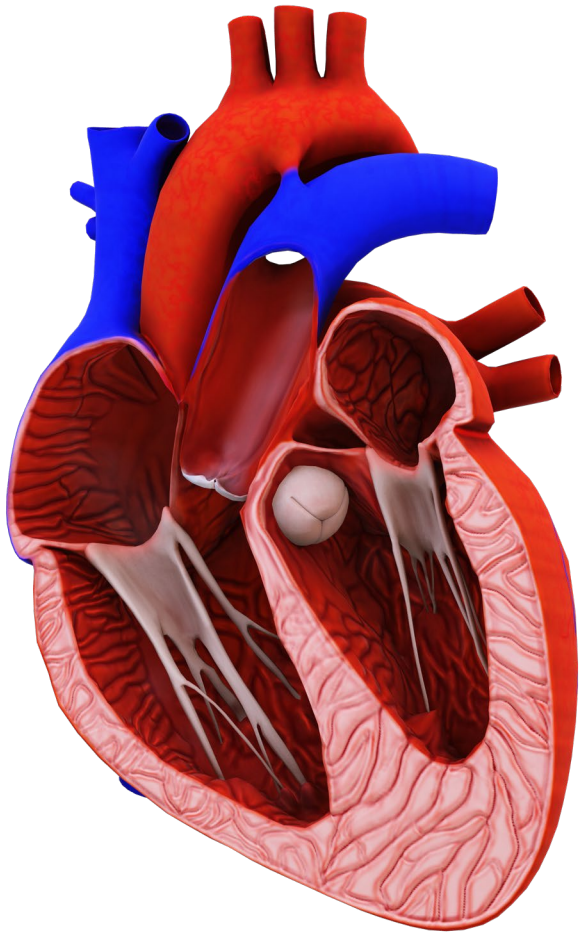
THE MONITOR IS GOING TO SPIT SOMETHING OUT…

Where we are headed

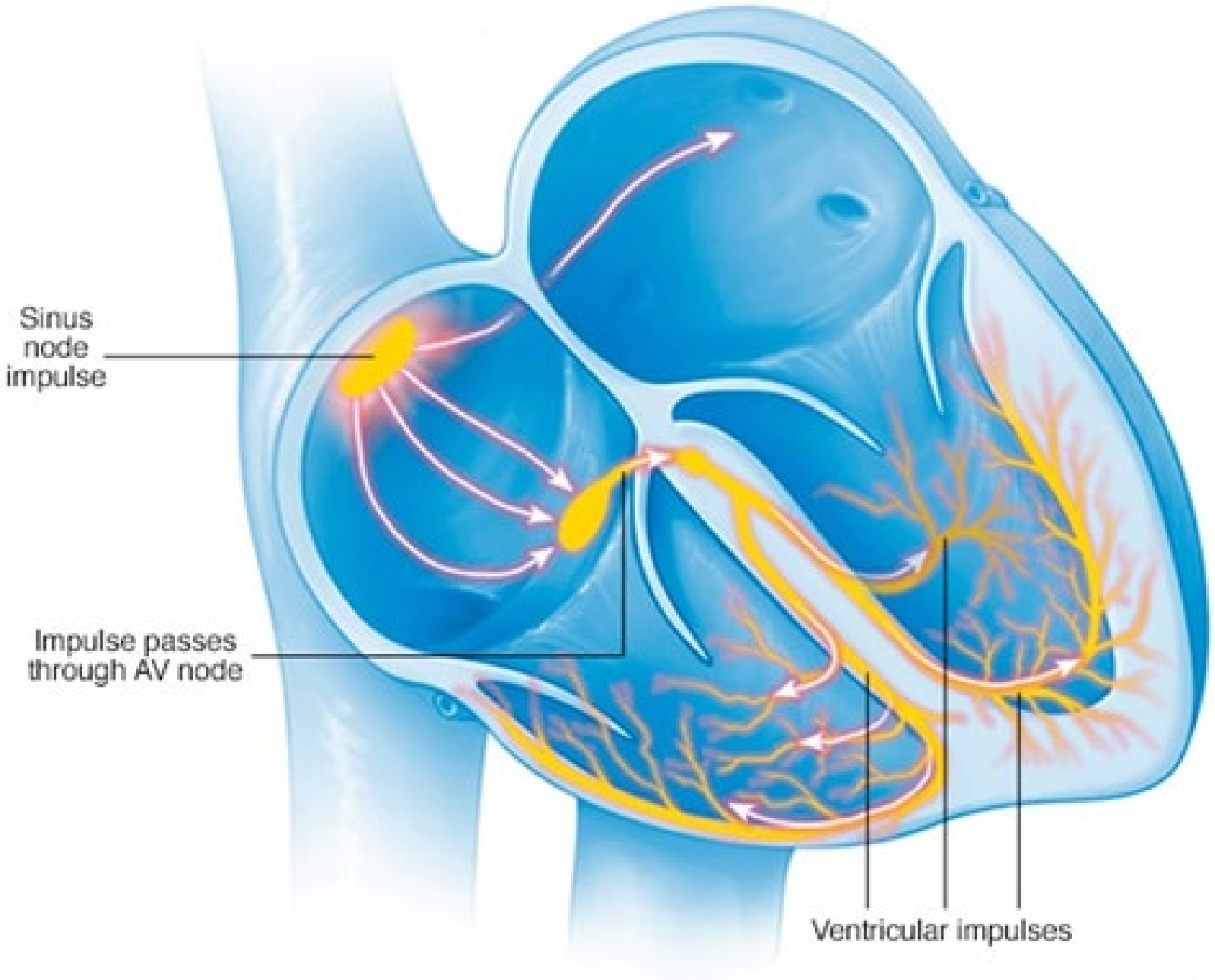
1. Review cardiac conduction
2. Talk about a standard approach to the tachycardic patient
3. Review specific types of tachycardia
4. Discuss patient management options

And what it looks like on your monitor

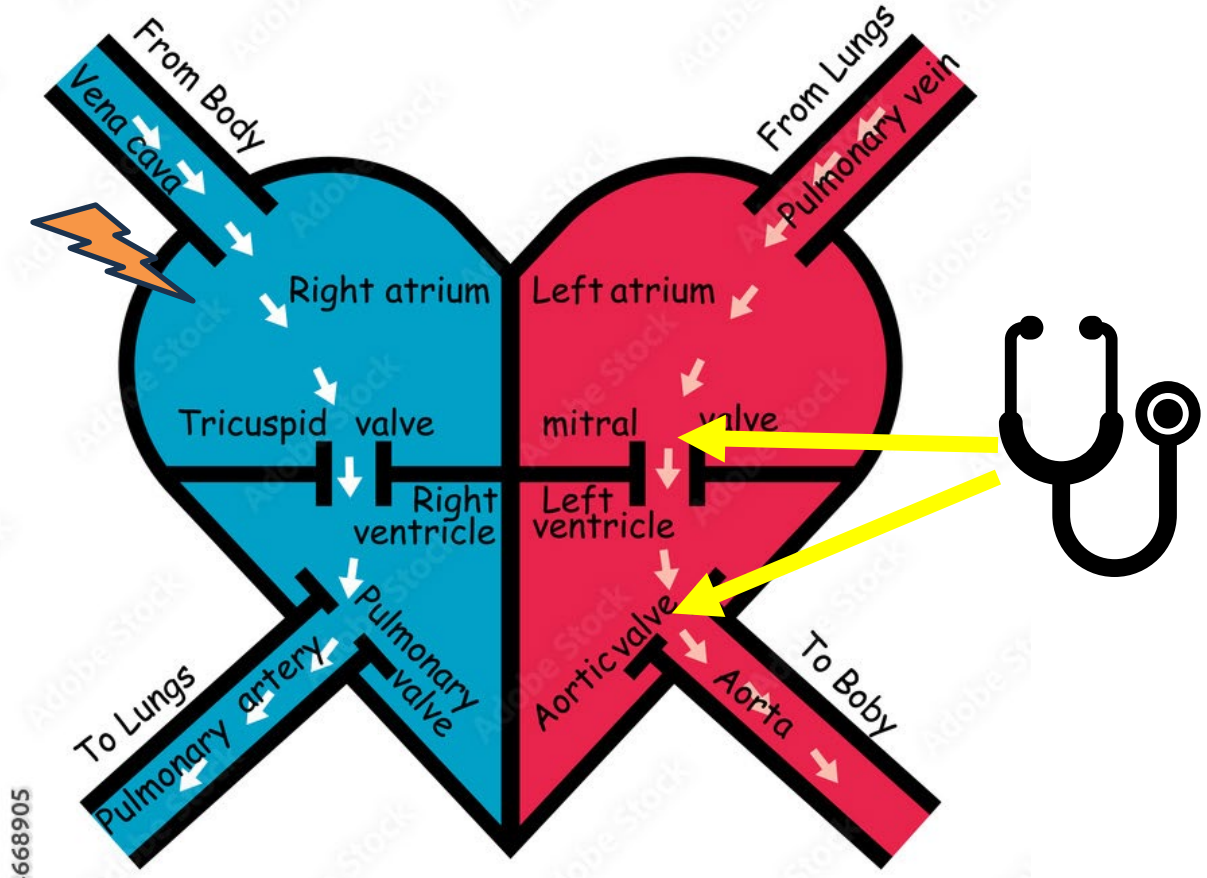
CARDIAC CONDUCTION



Quick Review: Cardiac Conduction



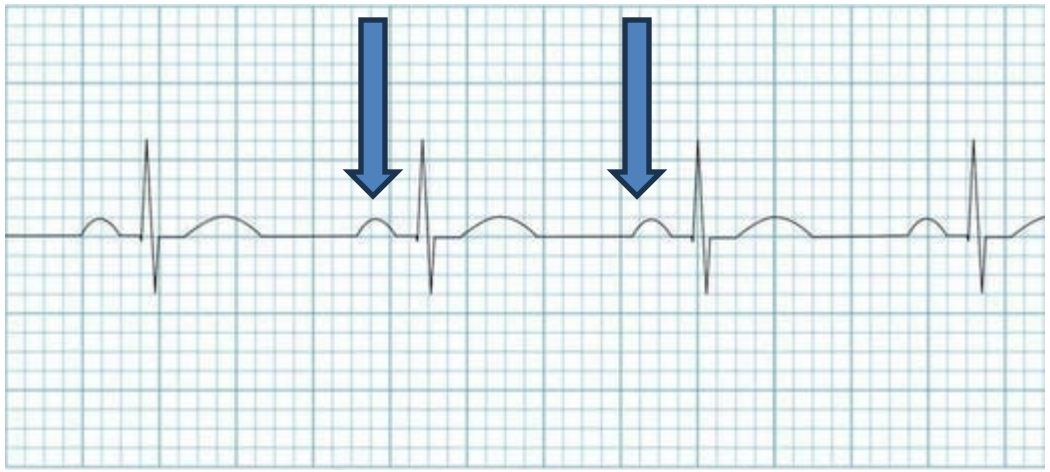
Blood flow/Pump flow



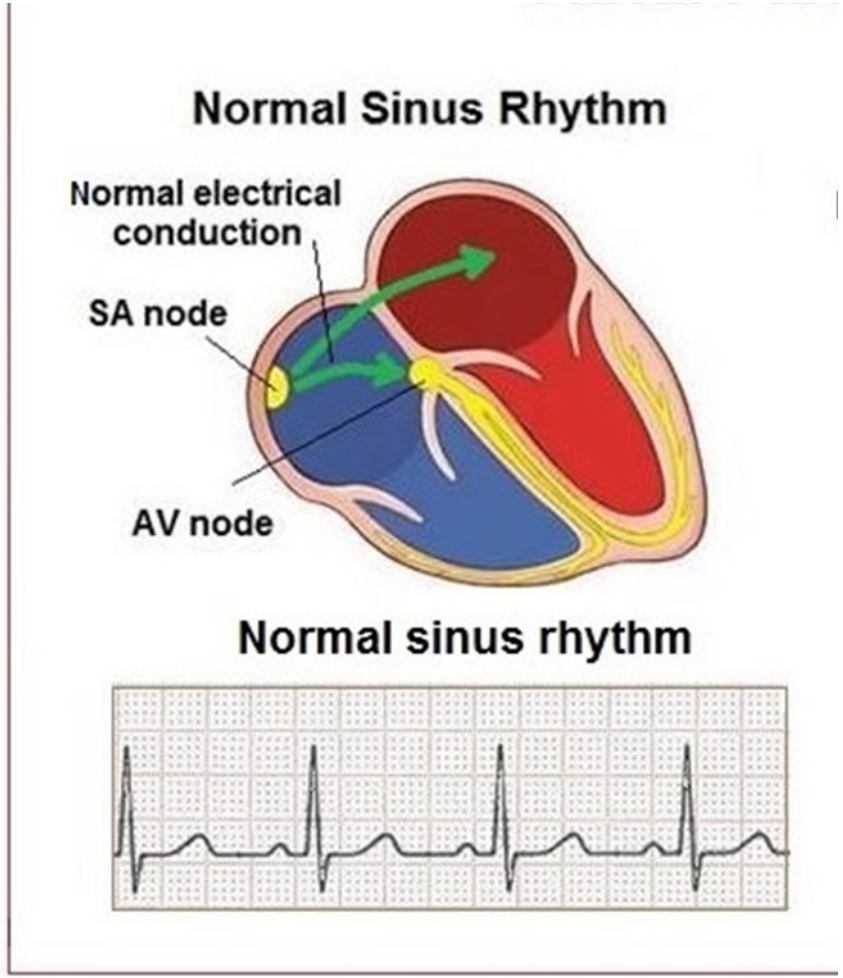
Feel the pulse =force of ventricle/fluid column on the vessel wall


A LITTLE EKG
STUFF

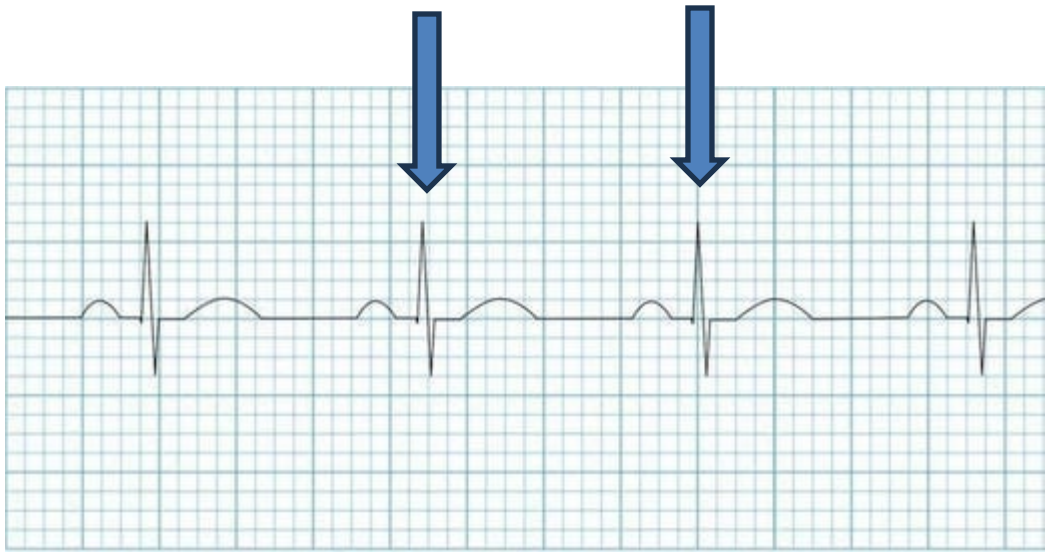
The “P” wave- Atria contract

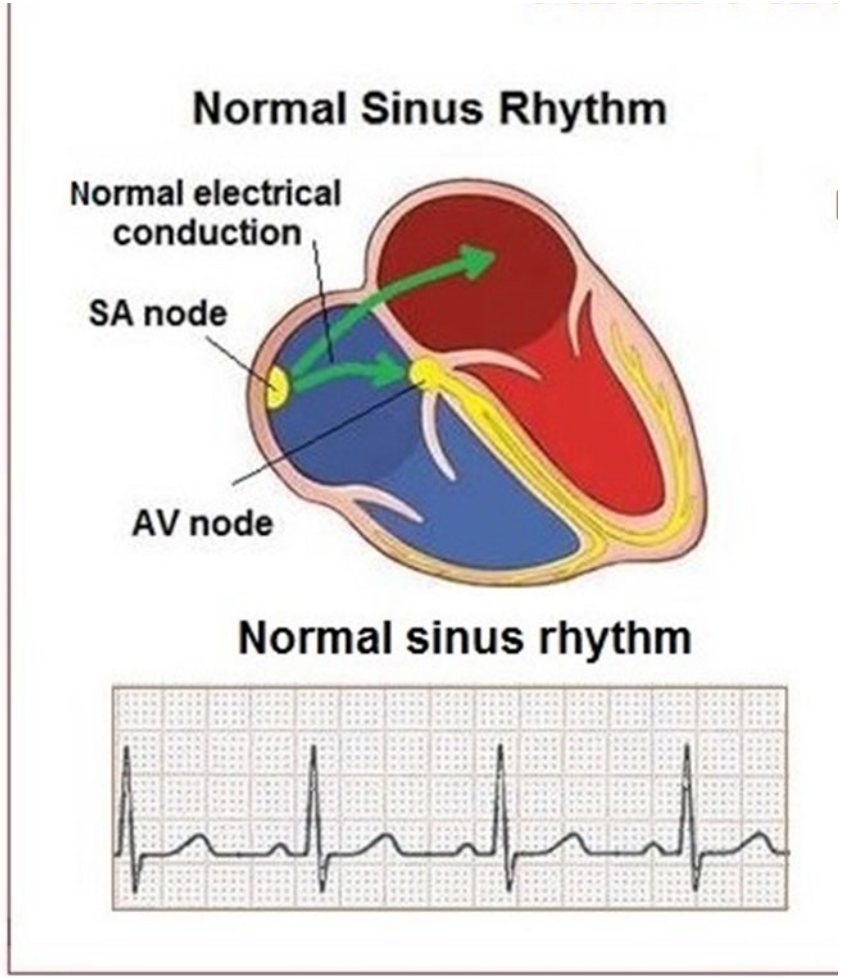


Atria = thin-walled kind of weak muscles
Most blood flows passively into the ventricles
Prime the main pump= Ventricles



The “QRS” -Ventricles contract



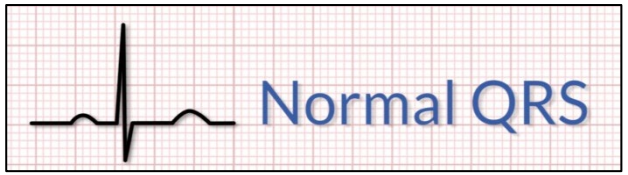


Ventricle = thick-walled, main pump
Peripheral circulation dependent on ventricular function
Produces the pulse we feel

Two Classifications: Ventricular Electrical Activity

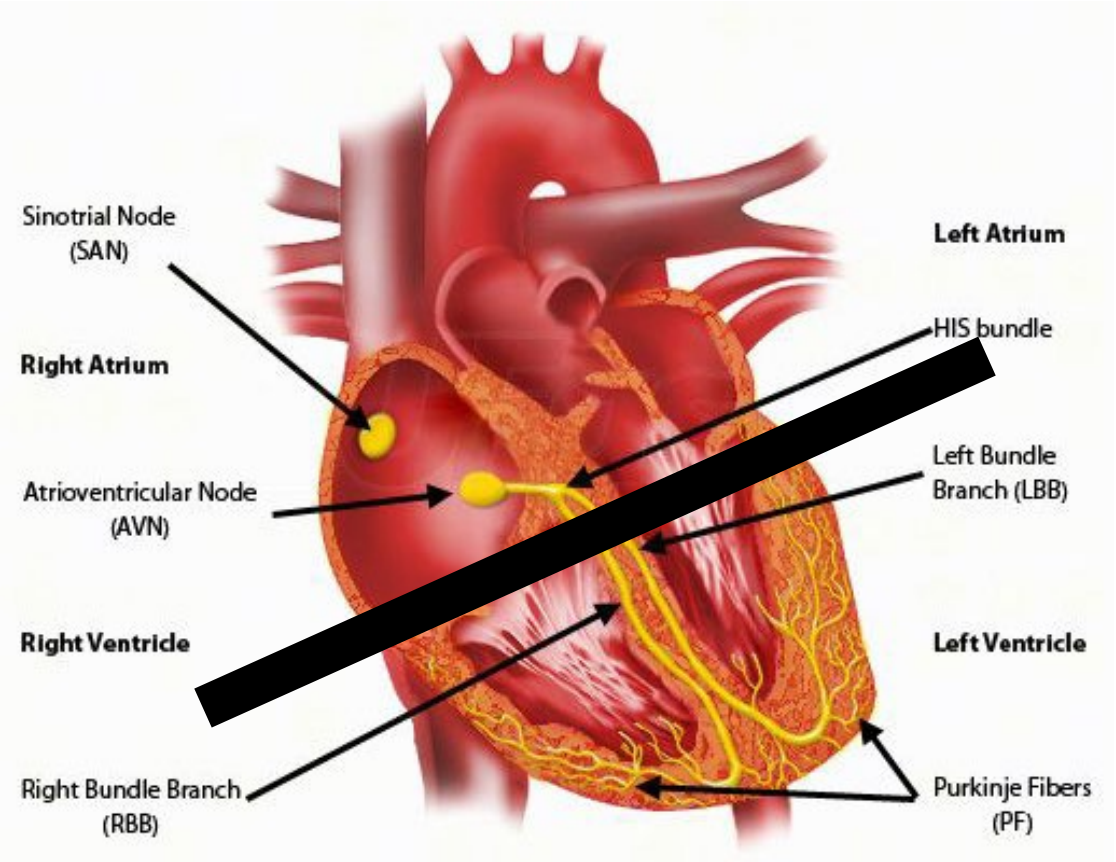
1. Narrow

- Narrow QRS



2. Wide

- Wide QRS



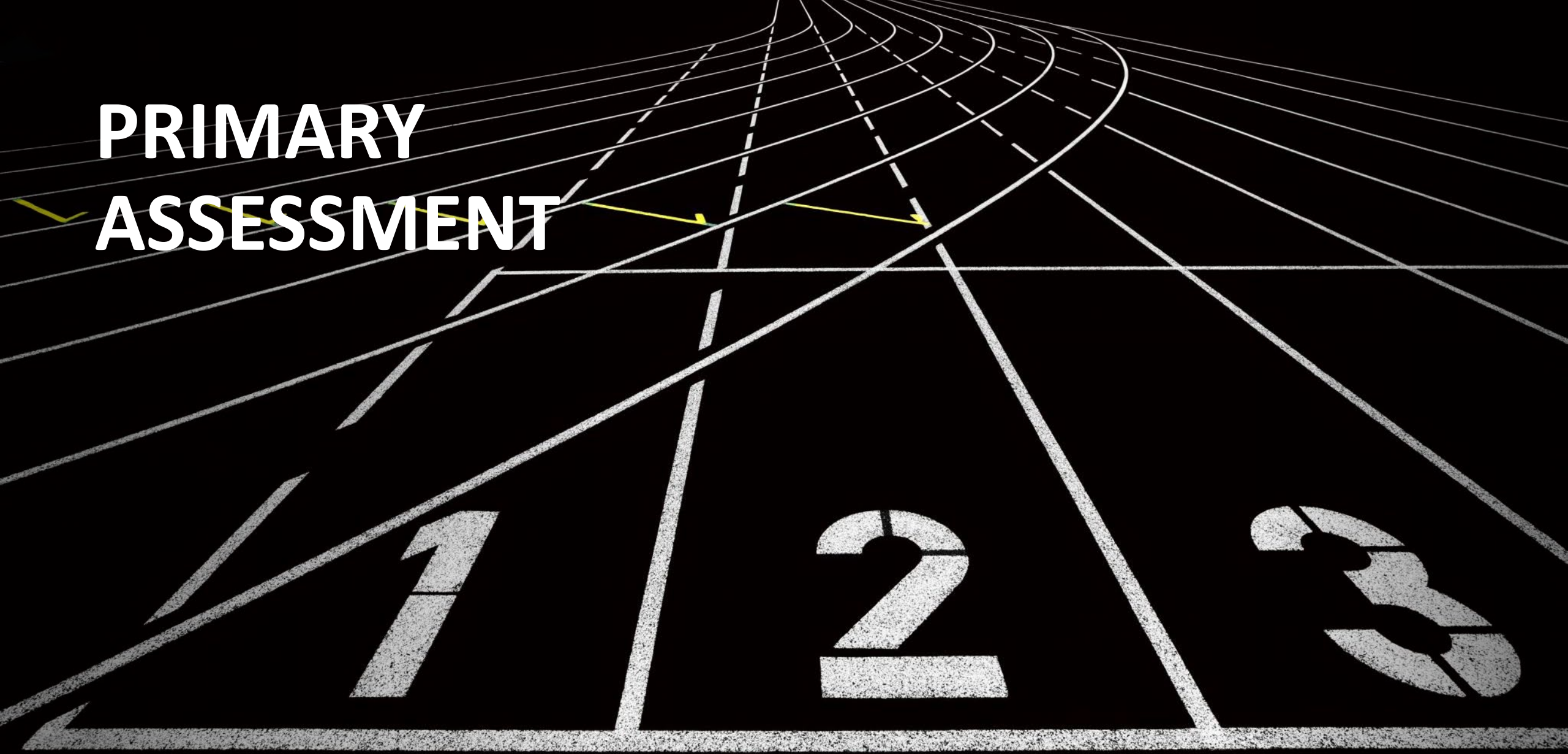
What's the problem with fast?

- Cardiac output = HR x Stroke Volume
  - If your heart rate increased significantly
  - Decreased ventricular filling time
  - Decreased cardiac output
- Any extra disease will decrease tolerance for tachycardia
  - Atrial
  - Ventricular

AN APPROACH TO TACHYCARDIA

One way to think about the things before the EKG- none of it requires a paramedic, just a thoughtful assessment

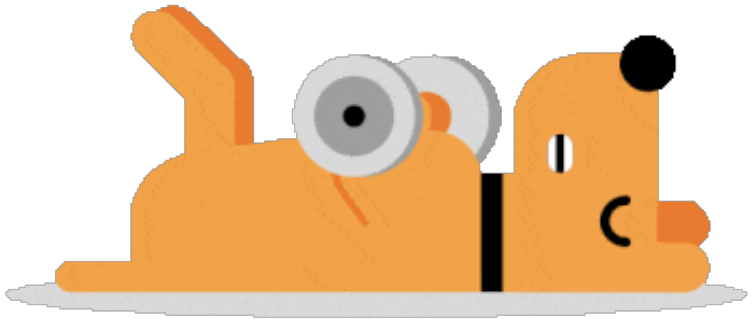
PRIMARY ASSESSMENT



Do I need to intervene on something now?

Is my patient “unstable”?

- Unstable= evidence of poor perfusion
- Is usually Hypotensive **+**
  - ❖ altered
  - ❖ pale
  - ❖ sweaty
  - ❖ unresponsive
  - ❖looks bad
- Sort of like the sick not sick question but a little more specific to circulation



If the answer is yes

- Do your normal things first
- Consider if you need to/should/can activate additional resources
- If you think its cardiac- Early placement of pads

Case

- 67 yo male with history of heart disease, Afib, on apixaban, CHF, DM
- Chest pain, shortness of breath
- General: diaphoretic, uncomfortable appearing, complaining of chest pain, shortness of breath
- 88/60 140-180 26 90% with poor waveform

- Stable/unstable? Initial interventions?

Is my patient tachycardic?

Tachycardia Question #1:

Is my patient tachycardic?

Rates and descriptions

- Fast rates= tachycardia
- Slow rates = bradycardia
- What is your heart rate?

Tachycardia

Heart Rate > 100 in adults

Kids→ use your reference material!

Does it look fast, feel fast or both?

1. **Is my patient tachycardic?**

Tachycardia Question #2:

Does my patient have an obvious or likely cause for their tachycardia?

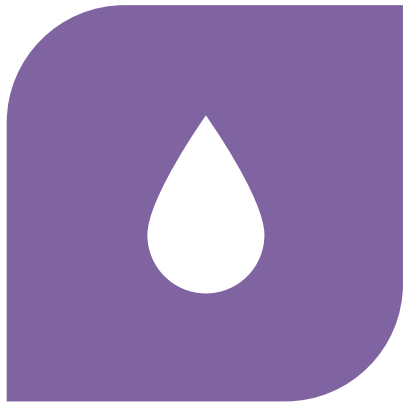
Tachycardia can be a normal response to variety of stressors

- Fever
- Exercise/increased demand
- Volume problems: low intake high output
- Anxiety/Fear
- Substances

Consider the tools to help answer the question

HISTORY

EXAM



VITALS

History pearls

Chief complaint/Events

- Onset- fast or slow
- Associated symptoms

Past medical history

- Rhythm things: Atrial fibrillation, Pacemaker or AICD, others
- Other heart things: MI etc
- Other diseases
- Risk factors: substance use/withdrawal, med changes

Medications

- Cardiac meds (digoxin, beta blockers, diltiazem)
- Anticoagulation
- Ask your patients specifically

Vital signs are vital

- Heart rate (what is the actual rate other than just fast)
- Blood pressure- did you check a manual?
- O2 sat- because- hypoxia
- Temperature- but don’t out-think your history and exam
- +/- glucose
- +/- EtCO2

Exam clues

- Pulse or cardiac exam
  - Is it **regular** (comes at predictable times)
  - Is it **irregular** (can't predict when the next beat comes)
  - Is it *really* fast or just kind of fast
- Other signs of causes of tachycardia
  - Substance use clues
  - Volume depletion clues
  - Infection clues
  - Others…

Case

- 67 yo male with history of heart disease, Afib, on apixaban, CHF, DM
- Chest pain, shortness of breath
- General: diaphoretic, uncomfortable appearing, complaining of chest pain, shortness of breath
- 88/60 140-180 26 90% with poor waveform

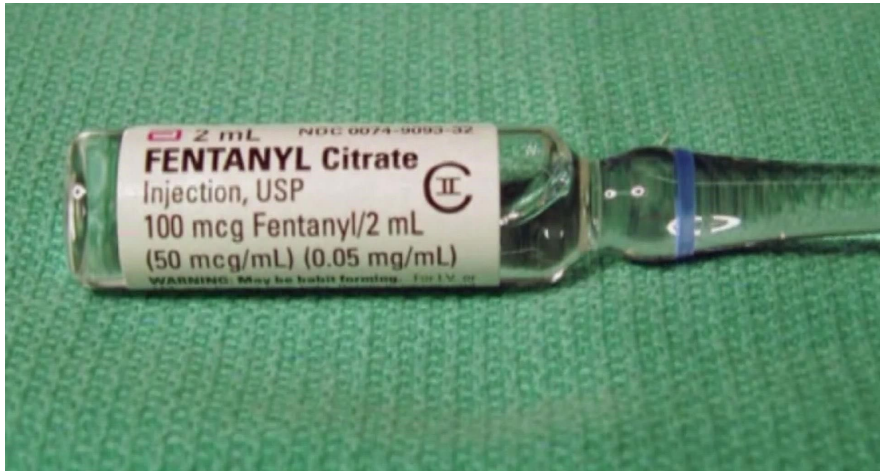
- Stable/unstable? Initial interventions?
- Tachy?
- Cause for tachycardia?

More info

- History:
  - 2 days of increased cough, shortness of breath, fatigue, feels flushed/warm
  - Chest pain with coughing, 5/10
  - Hasn’t been taking his meds because he feels so bad
  - No substance use history, no trauma,
- Vitals: Temp 100, O2
- Exam
  - Sweaty/diaphoretic
  - + crackly breath sounds bilaterally
  - Pulse present, feels fast, irregular
  - No edema

Differential/List of things this could be

- Infection/fever: pneumonia, symptoms of other infections?
- Dehydration: from poor oral intake (did I ask about vomiting or diarrhea?)
- Hypoxia: from pneumonia, from blood clot, from pulmonary edema…
- Heart function/muscle problems (muscle/pump problem): heart attack, heart failure exacerbation
- Primary rate (electrical) problem…



REGARDLESS OF THE ANSWERS TO ANY OF THE NEXT QUESTIONS

Initiate treatment for the likely cause if one exists

Tachycardia Question #3:

1. **Is my patient tachycardic?**
2. **Does my patient have an obvious or likely cause for their tachycardia?**

Based on all the previous, is it possible my patient's primary problem is their tachycardia?

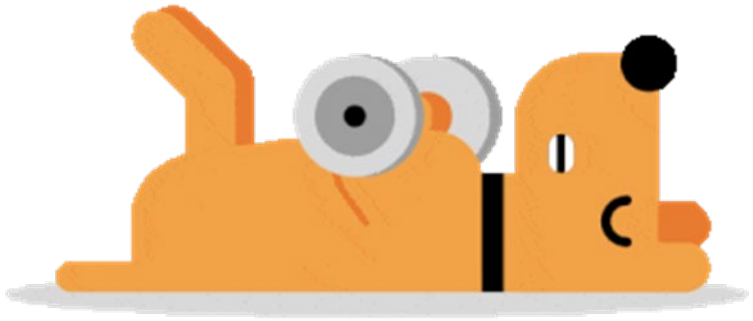
In other words

Are they having their current symptoms BECAUSE their heart is going so fast

Is this an electrical problem that is causing pump issues?

If unstable, remember

- Do the normal stabilization things (ABCS)
- Initiate treatment for possible causes of tachycardia
  - Fluid
  - Bleeding control
  - Fever control
  - Help with anxiety, pain
- Consider early placement of pads if suspicious



Why the actual rate helps: Remember 150 ish

In an UNSTABLE patient

Slower than 150= some other problem, not the rate itself	Faster than 150= increased **chance** its from the rate

In a stable patient all this is still important but much less pressing to figure out

There is almost always time for one more question

- Don’t hesitate especially if the answer will impact your management
  - History of abnormal rhythms
  - Medication compliance
  - Anticoagulation
  - Has this ever happened before

- 65 yo woman
- Called for palpitations. Felt normal this morning. Started suddenly.
- Awake, looks uncomfortable
- 98/66 180 22 95% room air

- Stable/unstable
- Tachycardic?
- Other cause?
- Is it possible the primary problem is the rhythm/rate?
  - Has a history of supraventricular tachycardia

1. **Is my patient tachycardic?**
2. **Does my patient have an obvious or likely cause for their tachycardia?**
3. Based on all the previous, is it possible my patient's primary problem is their tachycardia?

What is with these questions?

Goal

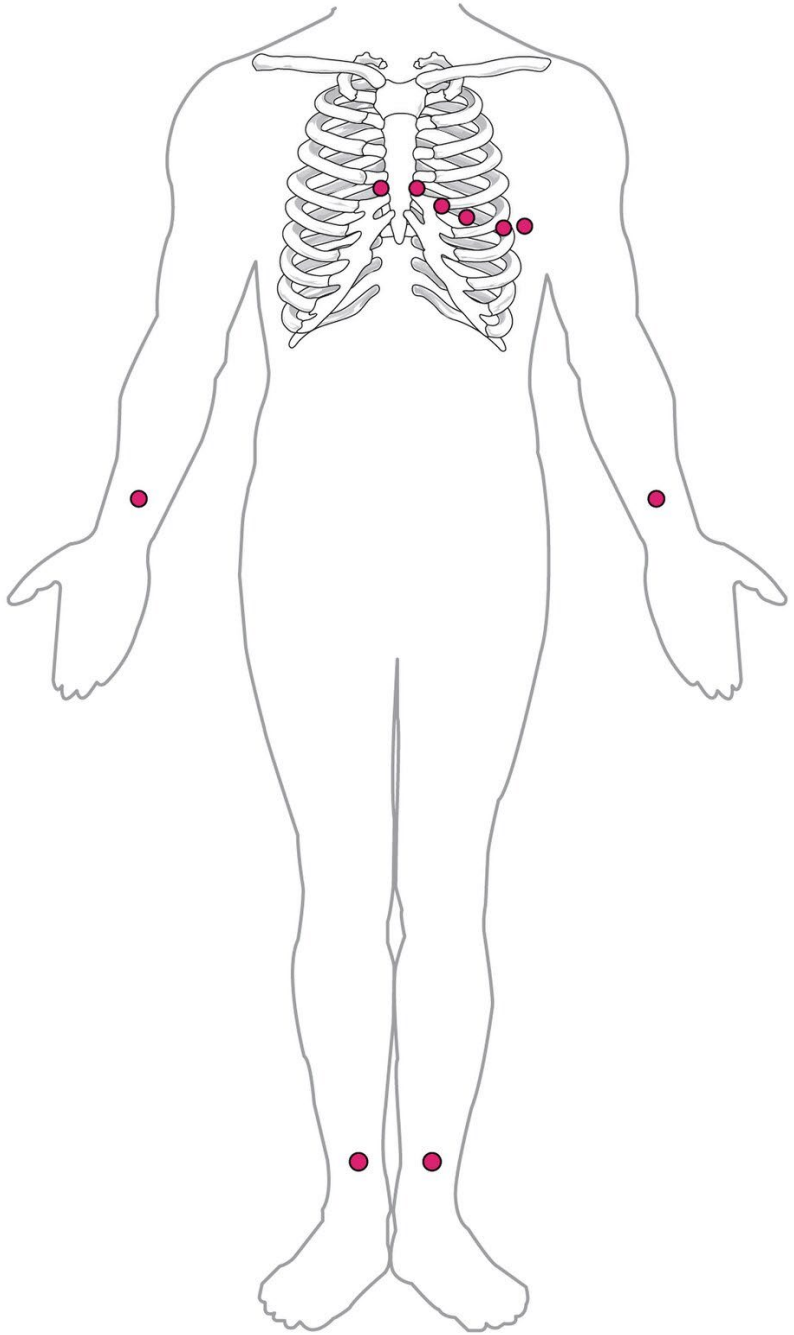
Is there some process that is causing the tachycardia?

Is the tachycardia actually the problem we need to investigate?

Of note, we haven't even looked at an EKG yet…

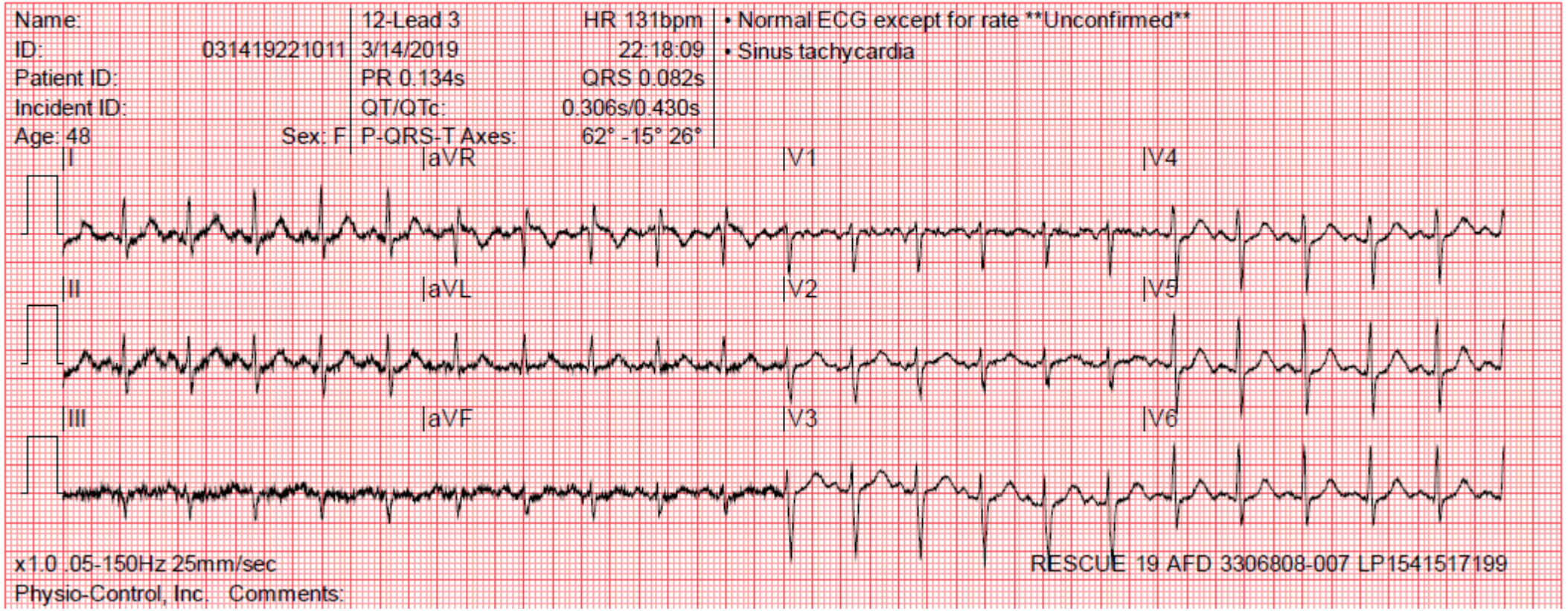
Can I get the EKG already?

YES!	In parallel to answering the previous questions
Even	Even if there is another reason for the tachycardia you identify
But	The EKG is just one data point. Don't get distracted by the EKG

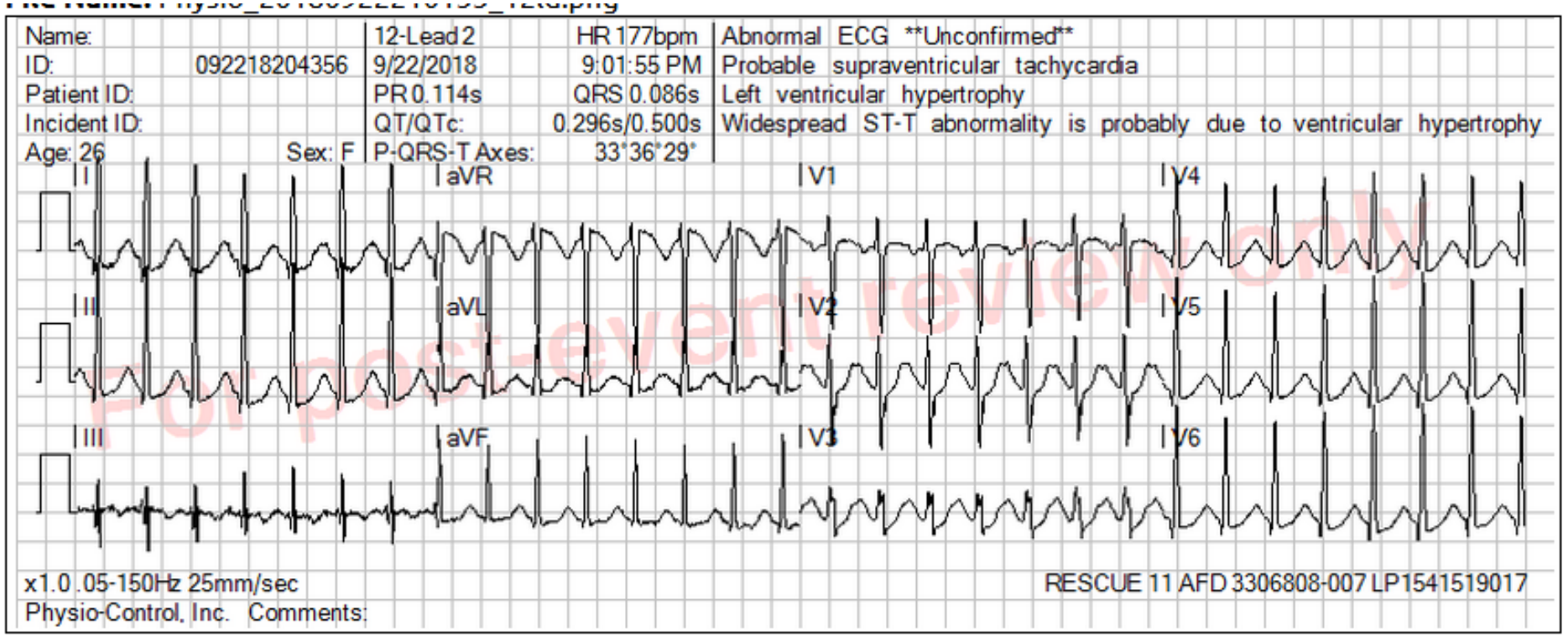


TACHYCARDIC PATIENTS SHOULD GET 12 LEAD EKGS

And the monitor says…



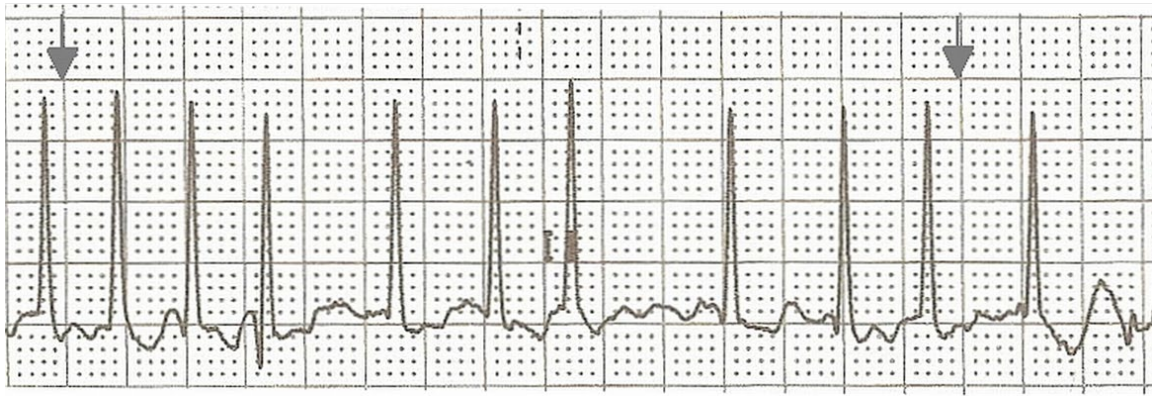
SINUS TACHYCARDIA= PROBLEM IS LIKELY SOMETHING ELSE- GO SEARCHING



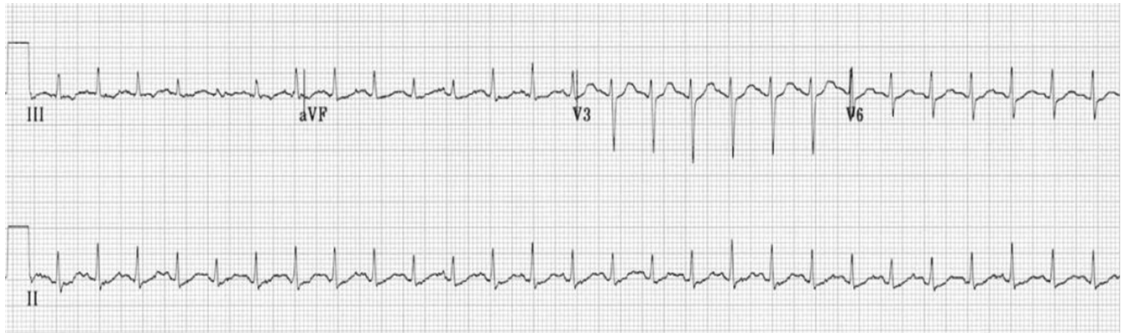
SUPRAVENTRICULAR TACHYCARDIA= PROBLEM

COULD BE THE ELECTRICITY

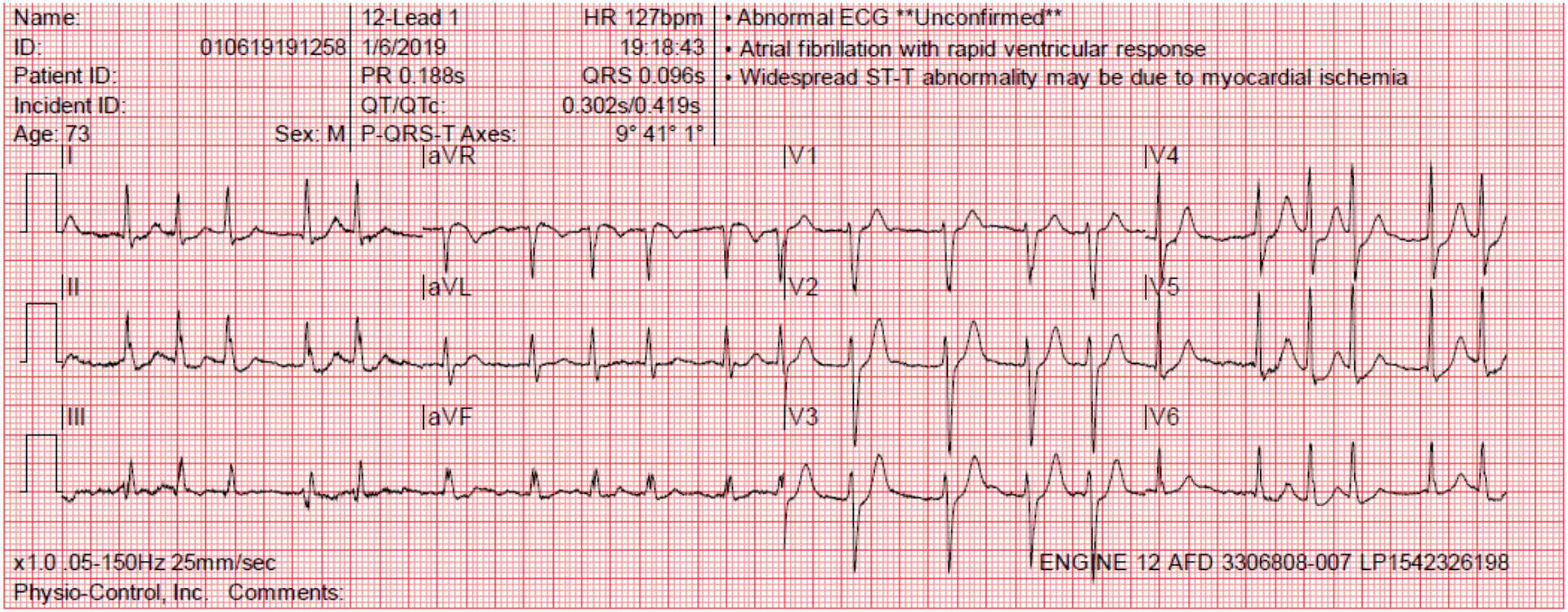
Visually different and Clinically



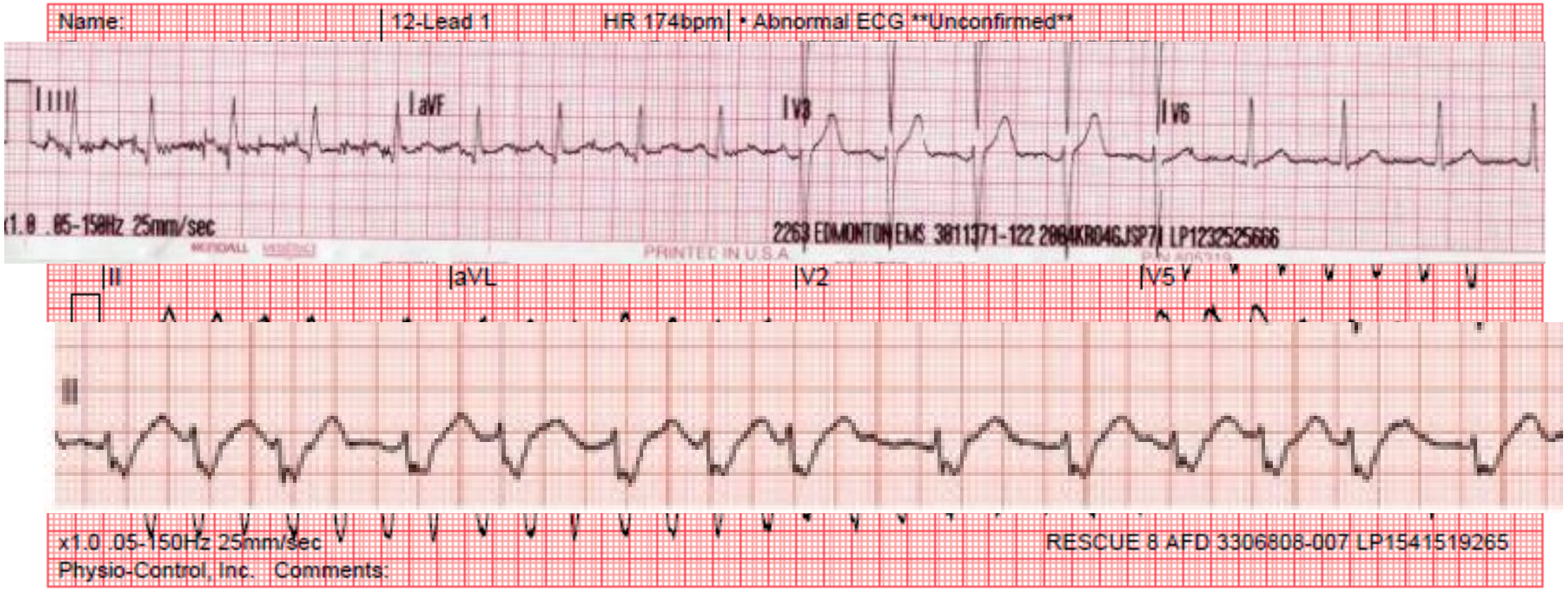
All over the place



Regular



ATRIAL FIBRILLATION WITH RVR= NO MAN'S LAND- NEED A REALLY GOOD HISTORY/EXAM



LOOKS WIDE (JANKY)= INCREASED LIKELY ELECTRICAL PROBLEM+, PLACE PADS, BE READY

You don’t have to be a paramedic to work up the tachycardic patient

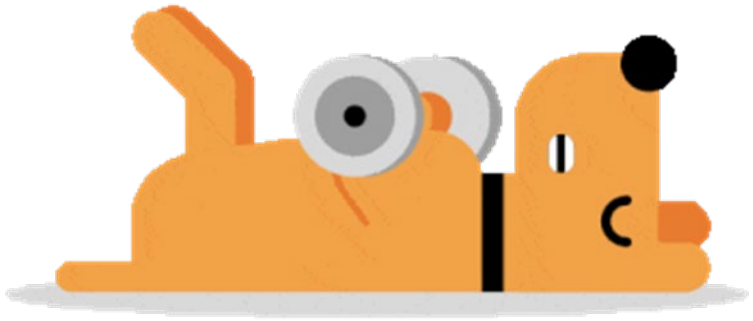
SUMMARY

1. **Is my patient tachycardic?**
2. **Does my patient have an obvious or likely cause for their tachycardia?**
3. Based on all the previous, is it possible my patient's primary problem is their tachycardia?

Stable vs. Unstable
Ask your questions
Initiate treatments
Get an EKG

Interventions

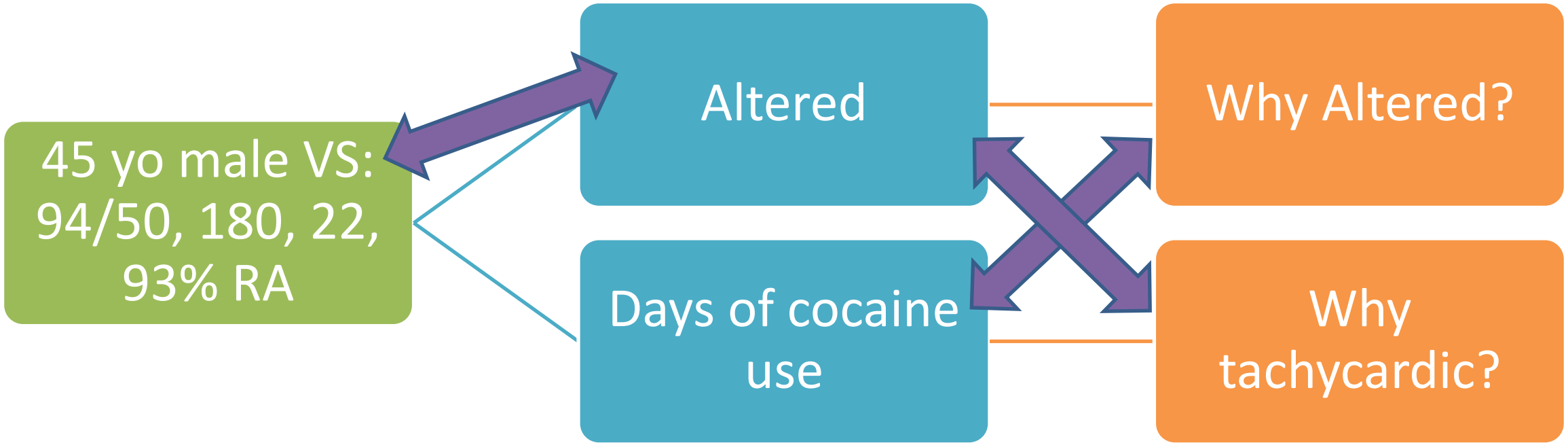
- Do the normal stabilization things (ABCS)
- Initiate treatment for possible causes of tachycardia
  - Oxygen
  - Fluid
  - Hemorrhage control
  - Fever control
  - Help with anxiety and pain
- Consider early placement of pads if suspicious for electrical problems
- Get an EKG
- Consider if you need ALS resources



EMS CONSORTIUM

Questions?

More complicated



Questions

Stable or Unstable?

Is my patient tachycardic?

Is there a reason they are tachycardic?

Is it possible the **primary** issue is the tachycardia (heart rhythm) not something else?

Rate 160s-170s – sinus tachycardia