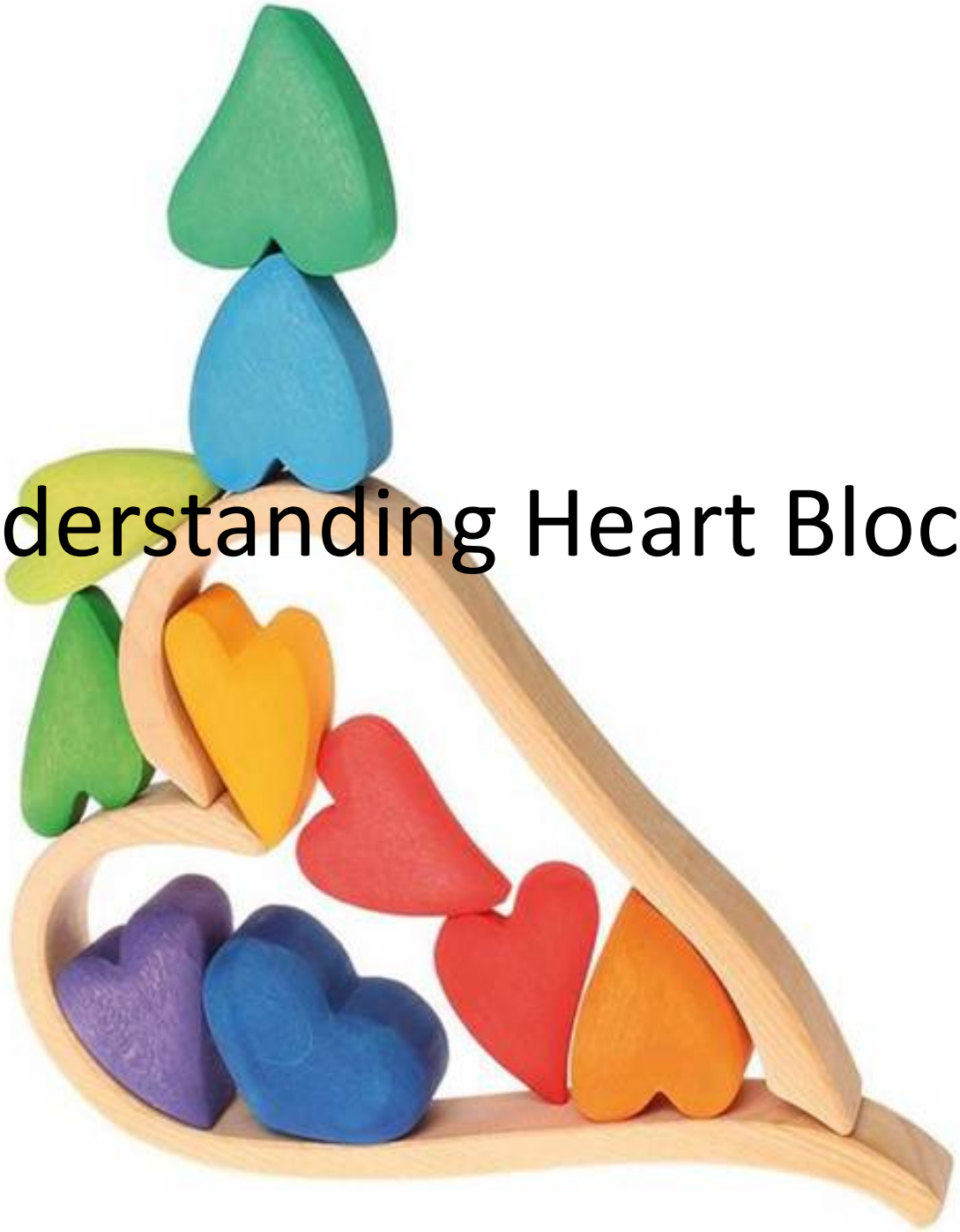
Understanding Heart Blocks



Objectives

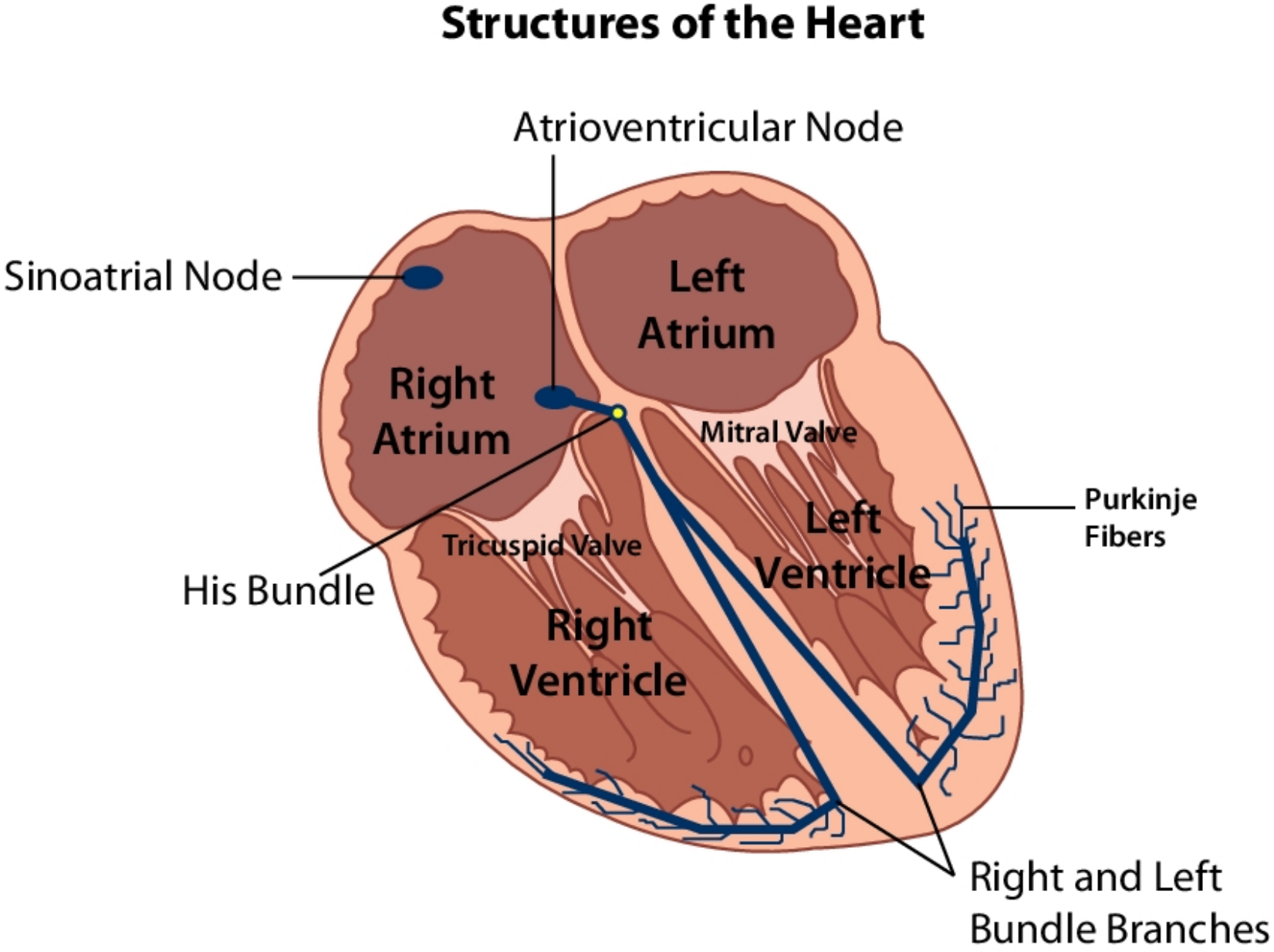
- Review anatomy of the electrical system of the heart
- Discuss 4 major heart blocks
- Provide a means to remain how to keep from getting them confused
- Discuss treatment options for patients experiencing a heart block

Assumptions and Disclosures

- Traditional terms will be used – not trying to offend anyone, SO…
- Thicken your skin
- Have fun with it
- Always remember…

  Its ALWAYS the guy's fault

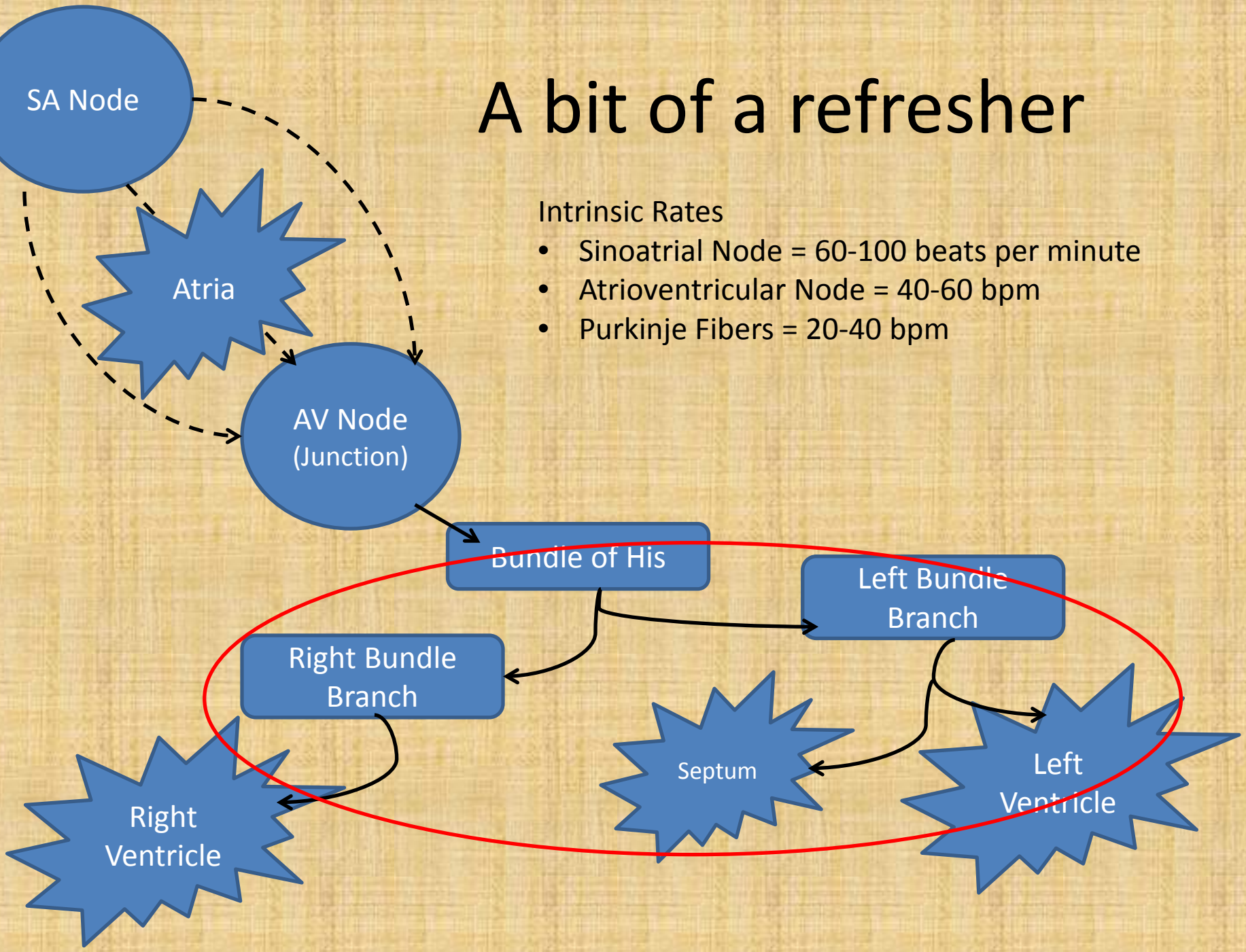
Review of the anatomy



A bit of a refresher

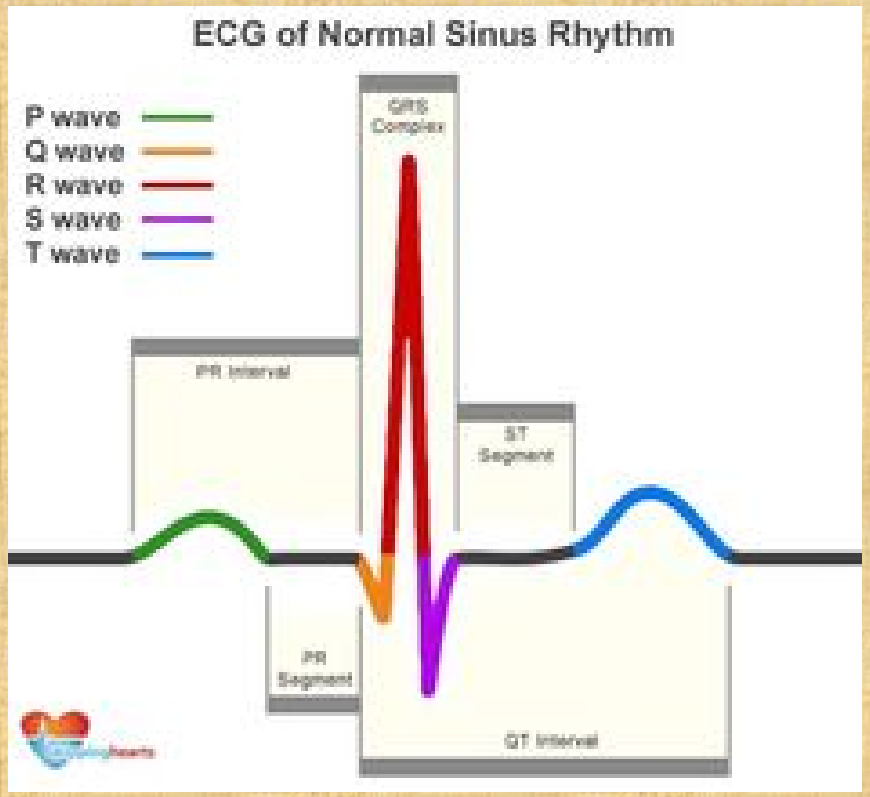
Intrinsic Rates

- Sinoatrial Node = 60-100 beats per minute
- Atrioventricular Node = 40-60 bpm
- Purkinje Fibers = 20-40 bpm



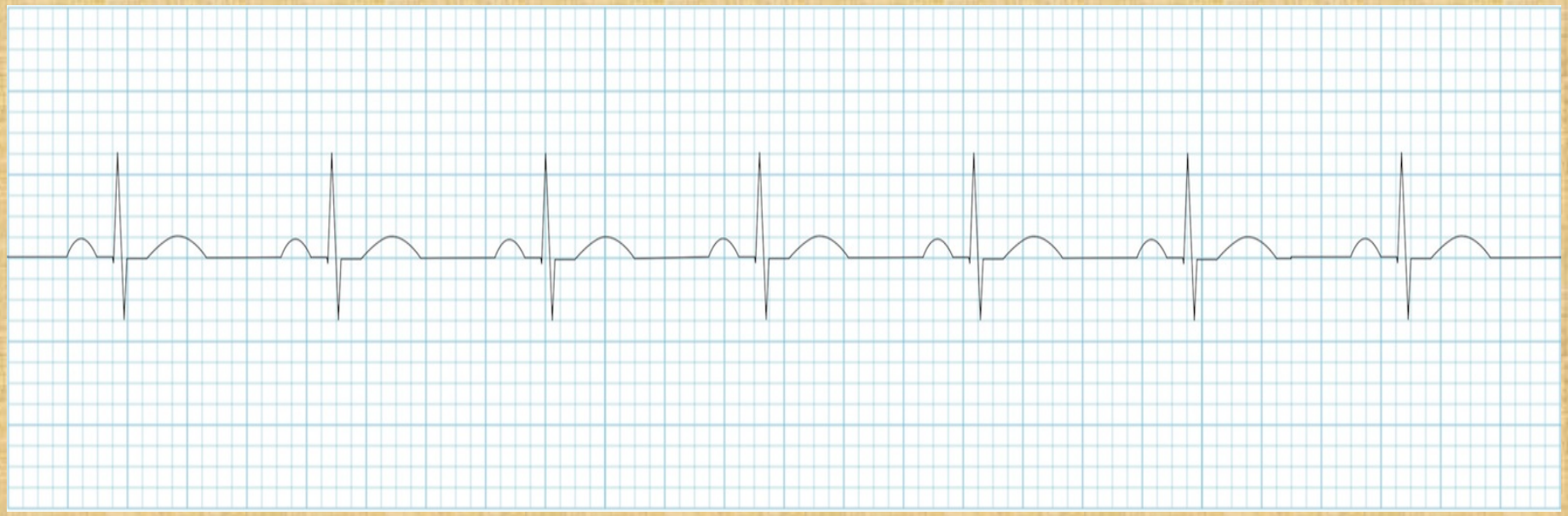
The Norms – Meet P and QRS

Normal Sinus Rhythm



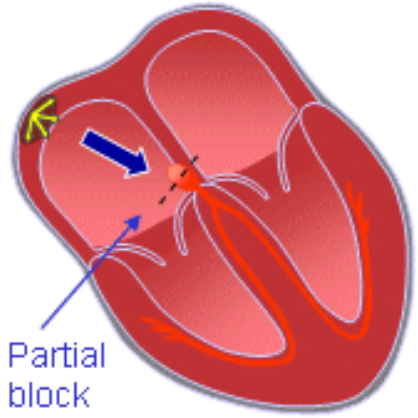
– Regular rhythm
– 60 – 100 bpm
– P wave for each QRS
– PR interval between .12 and .20 seconds
– QRS is less than .12 seconds

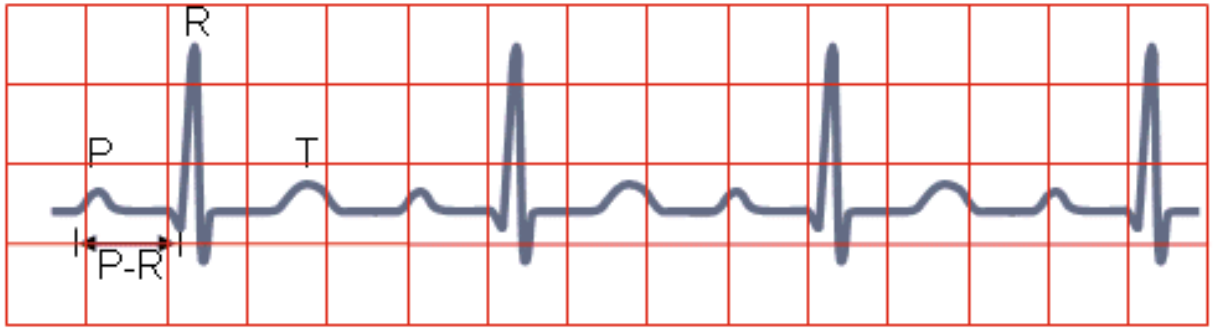
Normal Sinus Rhythm



- The default heart rhythm
- P wave is there and QRS follows each time and in a predictable manner
- PR interval is constant
- Perfect symmetry for our couple

1st Degree Heart Block

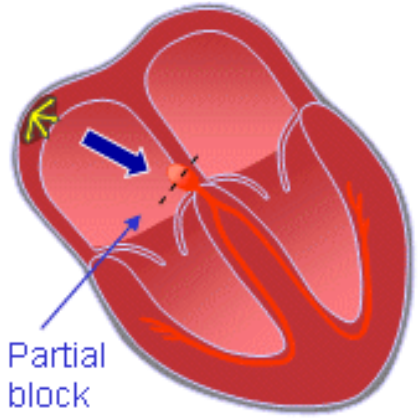


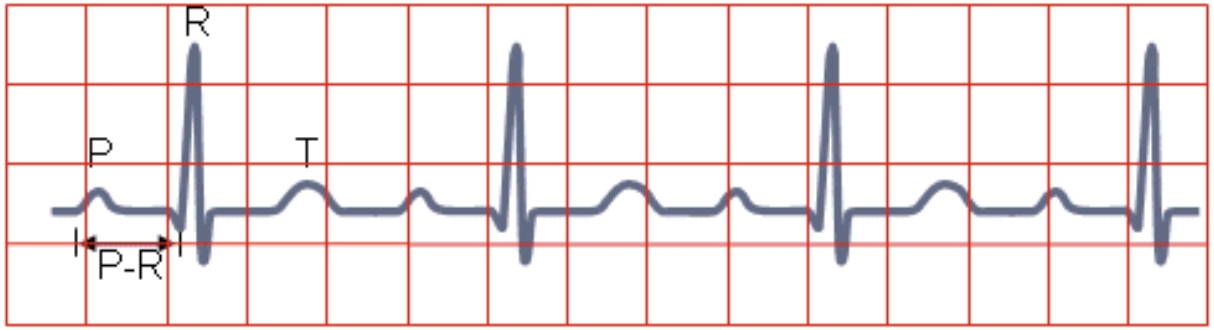


P-wave precedes each QRS-complex but interval is > 0.2 s

- Transmission is slowed through the junction
- Creating prolonged PR interval → PR interval is > .20 seconds

1st Degree Heart Block





P-wave precedes each QRS-complex but interval is > 0.2 s

- Relationship between P and QRS has changed
  - QRS is coming home later than usual, but at the same time every night

1st Degree Heart Block

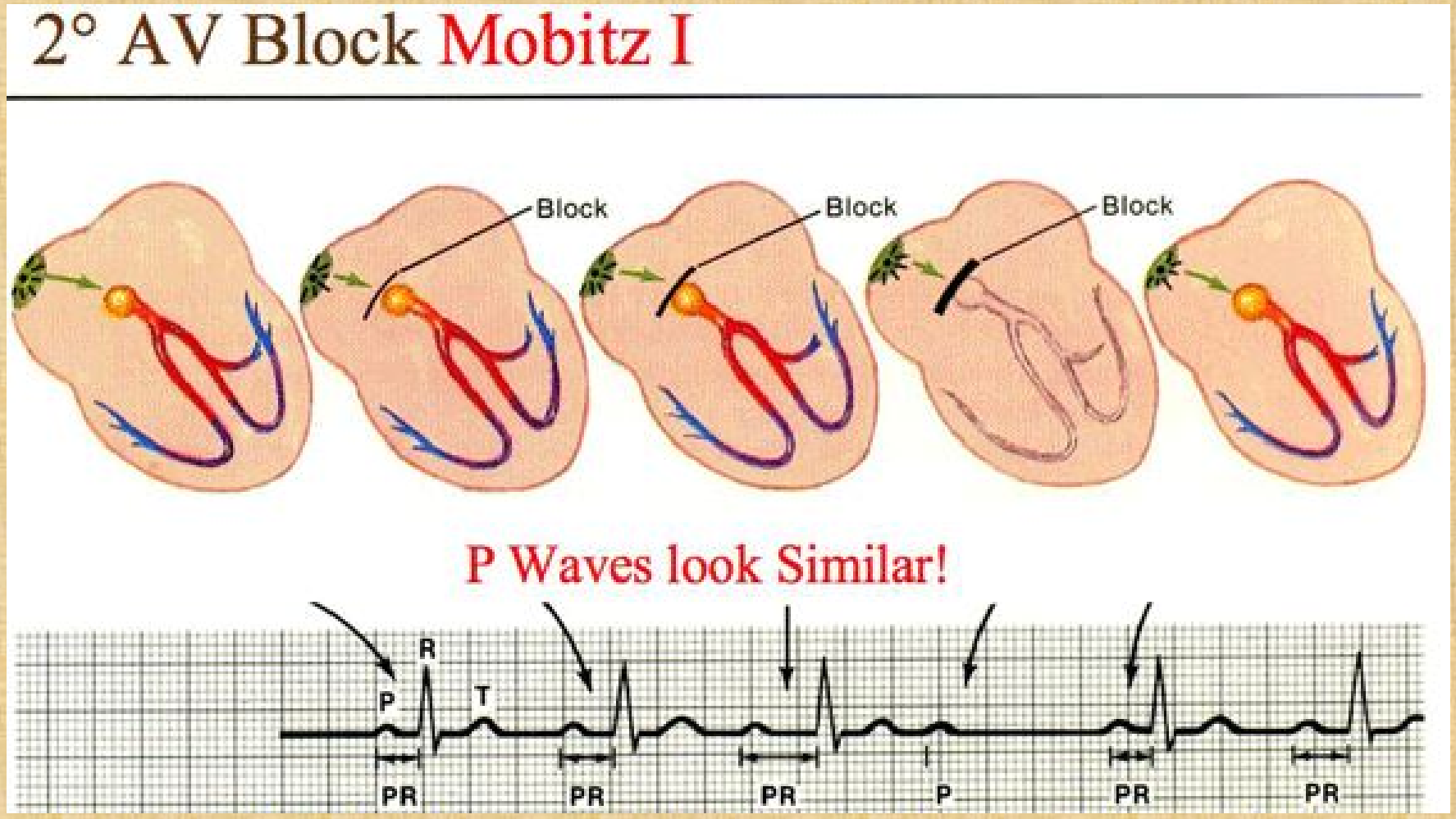
Symptoms

- May be asymptomatic
- Nausea
- Vomiting
- Chest Pain

Treatment

- May not require treatment
- Patient may not know this is their underlying rhythm
- Treat symptoms
- Generally require prolonged monitoring of ECG (in or out of hospital)

2nd Degree Heart Block Type 1



2nd Degree Heart Block Type 1 Wenckebach

- Transmission of impulse through the AV node is progressively delayed until there is a dropped ventricular beat
  - This resets itself after the dropped beat
- Becomes a predictable conduction manner
  - 3:1, 4:1, etc.

2nd Degree Heart Block Type 1

- The relationship has changed
  - QRS is staying out longer and longer until it is dropped
  - After the dropped beat, QRS returns to P at a normal time but then stays out longer and longer again
  - Predictable manner, once the pattern is identified

2nd Degree Heart Block Type 1

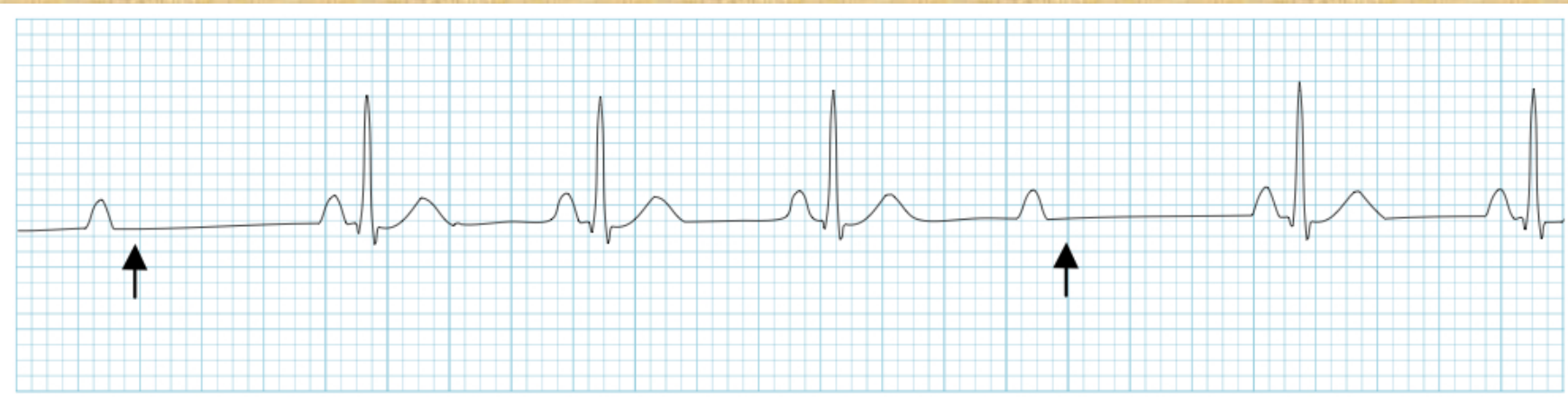
Symptoms

- May be asymptomatic (athletes and patients with no structural heart disease)
- Light-headed or dizzy
- Chest pain
- Regularly irregular heartbeat
- Bradycardia may be present
- Hypotension

Treatment

- Treat symptoms
- Monitor for additional signs of ischemia
- Symptomatic bradycardia should be managed by increasing the heart rate with TCP (preferred) or Atropine (with caution if suspecting MI)

2nd Degree Heart Block Type 2



- PR interval in the conducted beats remains constant
- P waves march out
- RR interval surrounding the dropped beat is exactly the same from the preceding RR interval; however, dropped beat(s)

2nd Degree Heart Block Type 2

- Usually a result of structural damage (ischemia) causing a failure of the conduction system at or below the Bundle of His
- Narrow QRS = block is within the Bundle of His (approx. 25%)
- Wide QRS = block is distal to the Bundle of His
- There may or may not be a pattern associated with the blocked complexes

2nd Degree Heart Block Type 2

- The relationship continues to get worse…
  - QRS is staying out more frequently and without warning
  - When QRS comes home it is at the same time, it may be later than expected or within a normal time

2nd Degree Heart Block Type 2

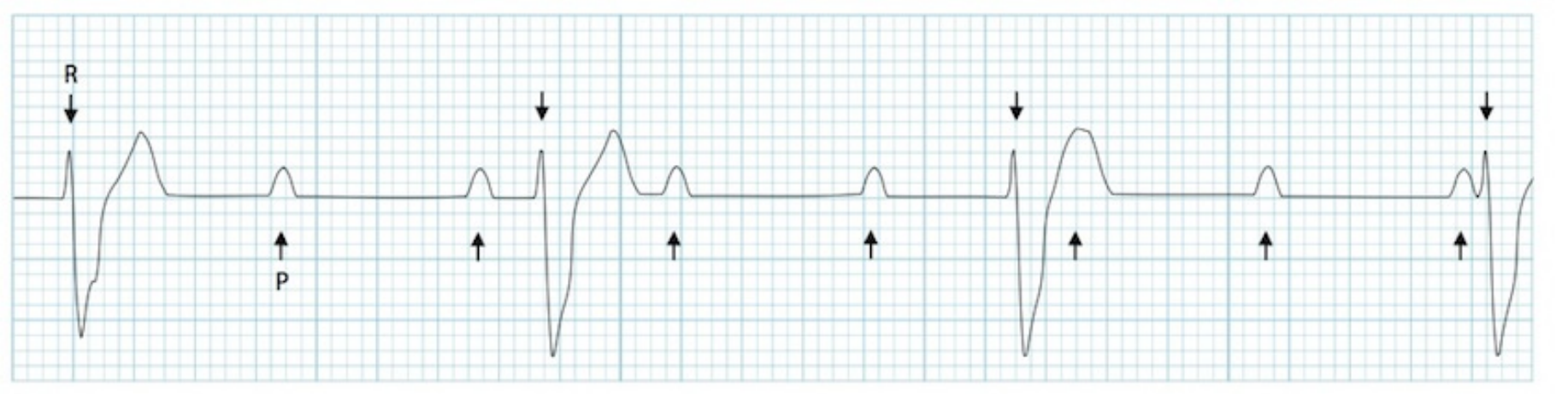
Symptoms

- May be asymptomatic (rare)
- Light-headed or dizzy
- Syncope
- Chest pain
- Regularly irregular heartbeat
- Bradycardia may be present
- Hypotension

Treatment

- Place pacer pads on patient
- Treat symptoms if they remain stable
- Monitor for additional signs of ischemia
- If symptomatic, do not delay in pacing

3rd Degree Heart Block



- Complete absence of AV conduction to the ventricles – “Complete Heart Block”
- Perfusing rhythm is maintained by a junctional or ventricular escape rhythm

3rd Degree Heart Block

- Atrial rate represented by P waves, ventricular rate results in bradycardia
- May be a result of progressive fatigue of AV nodal cells or a sudden onset of complete conduction failure throughout the Bundle of His/Purkinje fiber system

3rd Degree Heart Block

- The relationship is no longer existing
- QRS is now coming and going as he pleases
- P continues to fire at a regular rate, trying “to do the right thing”
- QRS usually changes in appearance (wide complex, since impulse is orginating from the ventricles)

3rd Degree Heart Block

Symptoms

- Light-headed or dizzy
- Syncope
- Chest pain
- Bradycardia is usually present
- Hypotension

Treatment

- Place pacer pads on patient and begin pacing to maintain blood pressure
- Treat additional symptoms during transport

Let’s practice

Thank you for your time

Questions?

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