

# 4

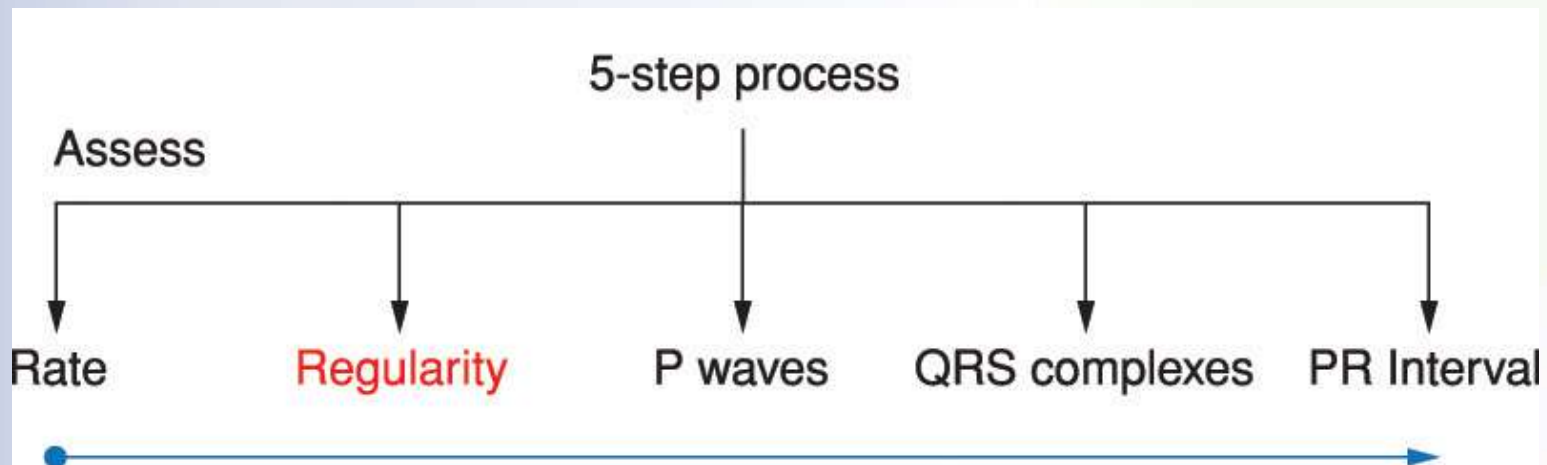
## Regularity

Fast & Easy ECGs – A Self-Paced  
Learning Program



# Regularity

- Second step of analyzing an ECG rhythm is determining its regularity



# Regularity

- Normally the heart beats in a regular, rhythmic fashion
- Distance between consecutive P waves and consecutive QRS complexes should be the same



# Regularity

- If the distance of the R-R intervals and P-P intervals is the same the rhythm is *regular*
- If the distance differs, the rhythm is *irregular*
- Irregular rhythms are considered abnormal

# Regularity

In this rhythm, each R-R and P-P interval is 21 small boxes apart. For this reason it is considered regular.



In this rhythm, the number of small boxes differs between some of the R-R and P-P intervals. For this reason it is considered irregular.



# Determining Irregularity

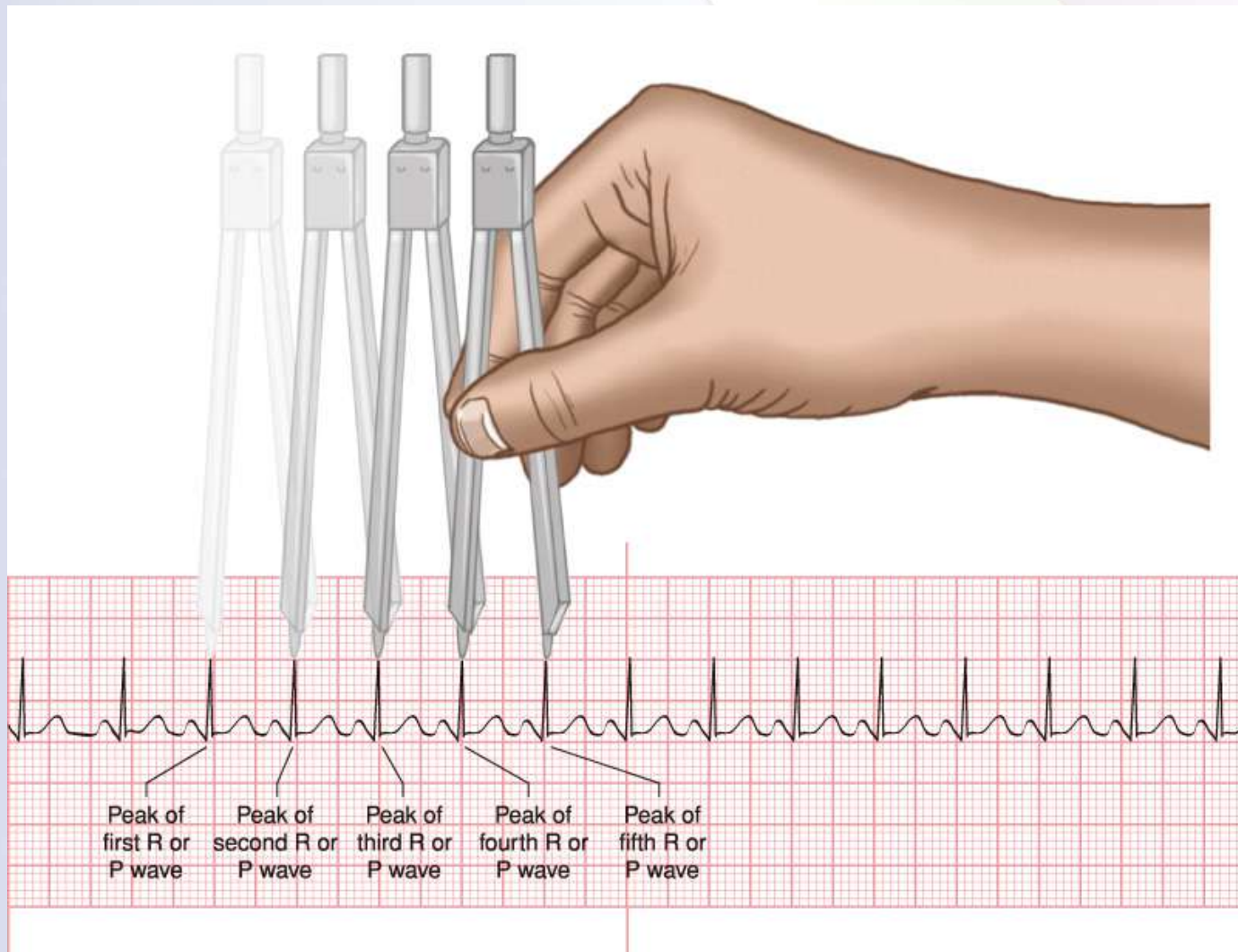
- Several methods can be used to determine rhythm regularity including:
  - Caliper Method
  - Paper and Pen Method
  - Counting the Small Squares Method



# Caliper Method

- Place ECG tracing on a flat surface
- Position one point of caliper on a starting point
- Open calipers by pulling the other leg until the point is positioned on the next R wave or P wave
- With the calipers open in that position and keeping the point positioned over the second P wave or R wave rotate the calipers across to the peak of the next consecutive (the third) P wave or R wave

# Caliper Method

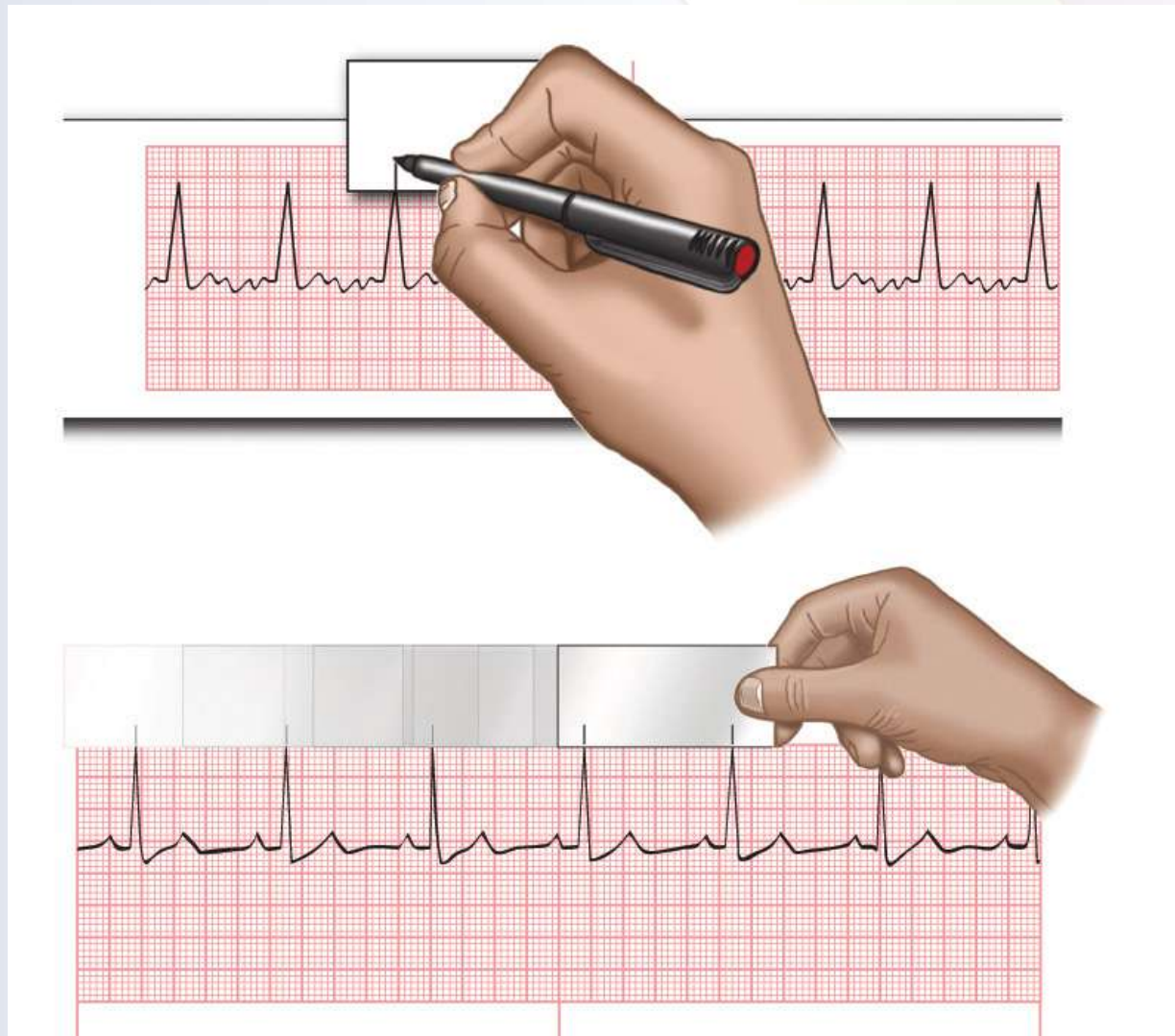




# Paper and Pen Method

- Place the straight edge of a piece of paper above or over the ECG tracing so that the intervals are still visible
- Identify a starting point and place a mark on paper in the corresponding position above it
- Find peak of the next consecutive R wave or P wave and place a mark on the paper in the corresponding position above it.
- Move the paper across the ECG tracing, aligning the two marks with succeeding R-R intervals or P-P intervals

# Paper and Pen Method



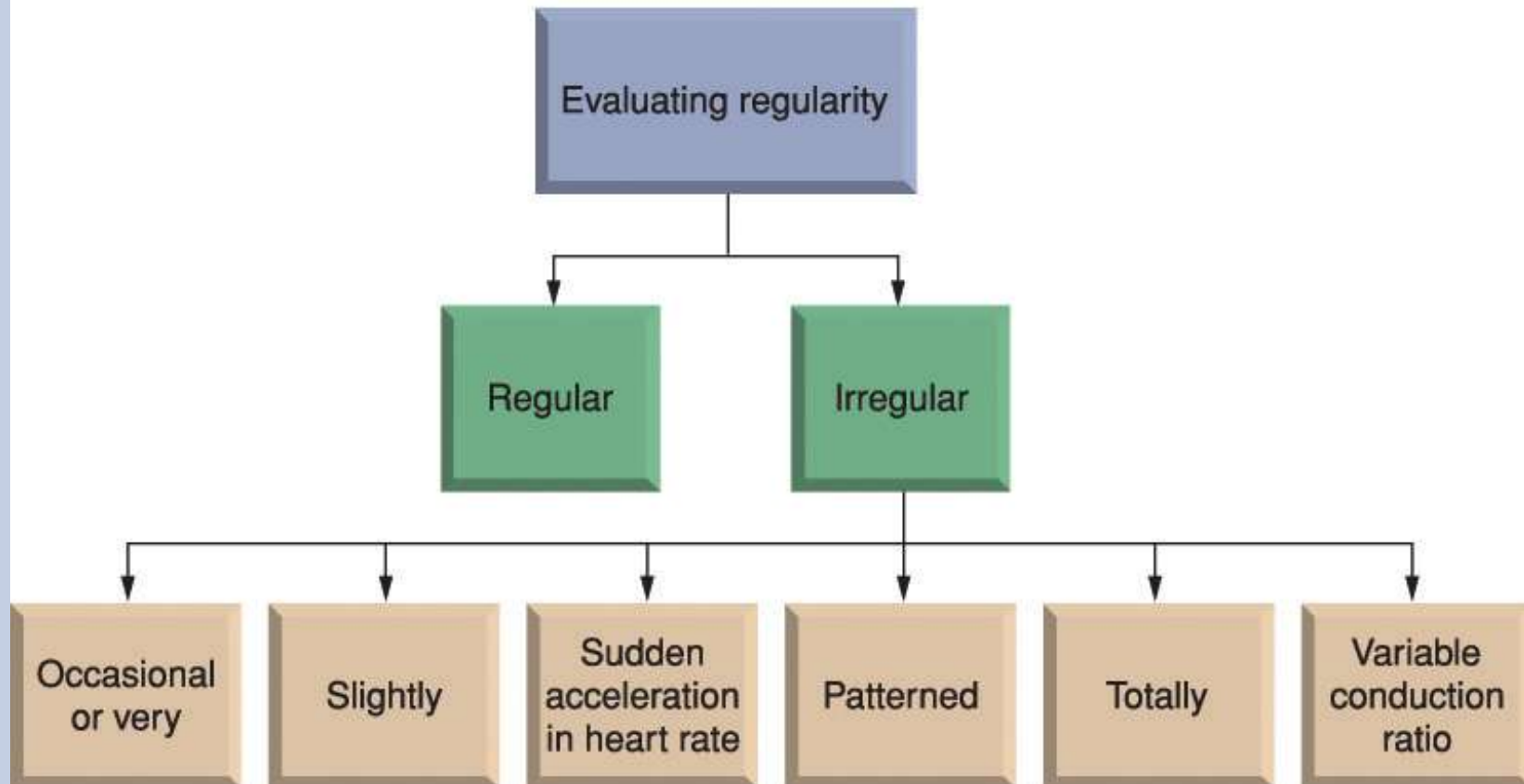
# Counting the Small Squares Method

- Count the number of small squares between the peaks of two consecutive R waves (or P waves) and then compare to the other R-R (or P-P) intervals
- If the number is the same, the rhythm is regular, if it isn't it is irregular



For this figure, we started counting from the last R wave because it fell on the bold line making counting of the small squares easier.

# Types of Irregularity



# Occasionally or Very Irregular

## *Occasionally irregular*

- Mostly regular but from time to time there is an area of irregularity

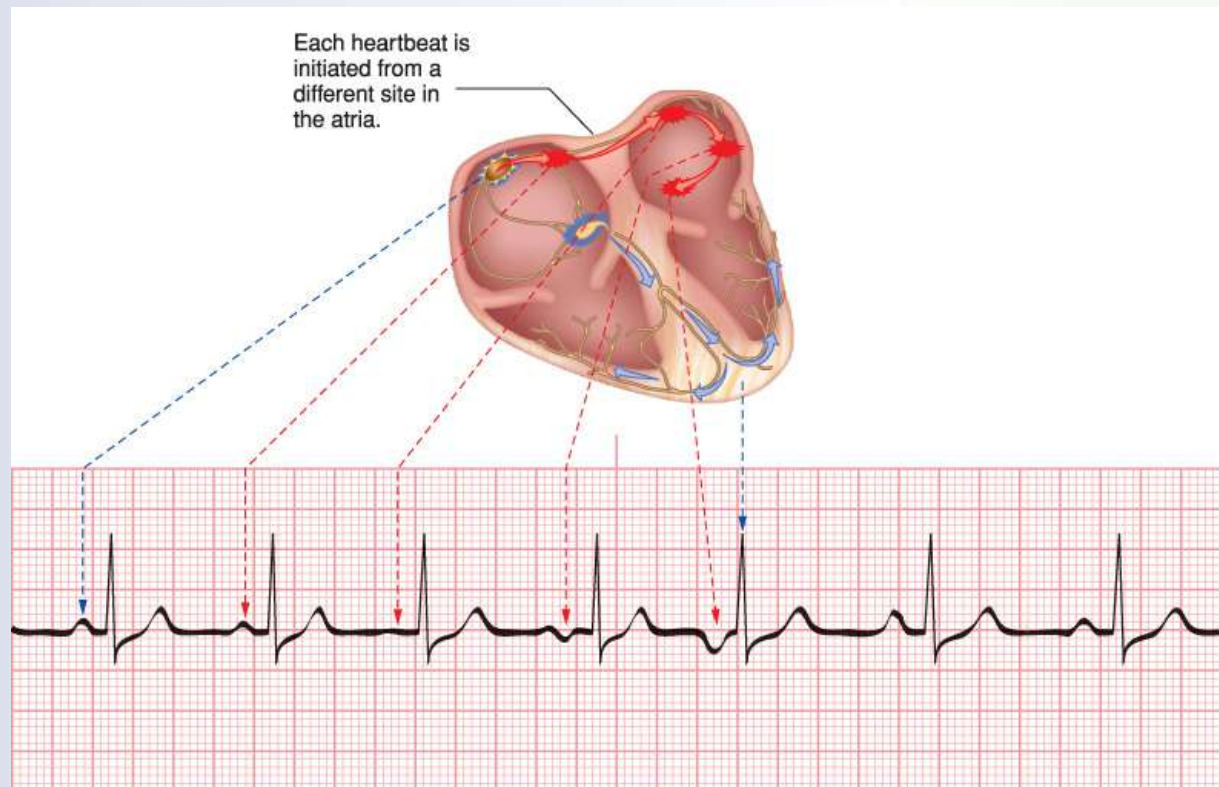
## *Very irregular*

- Has many areas of irregularity



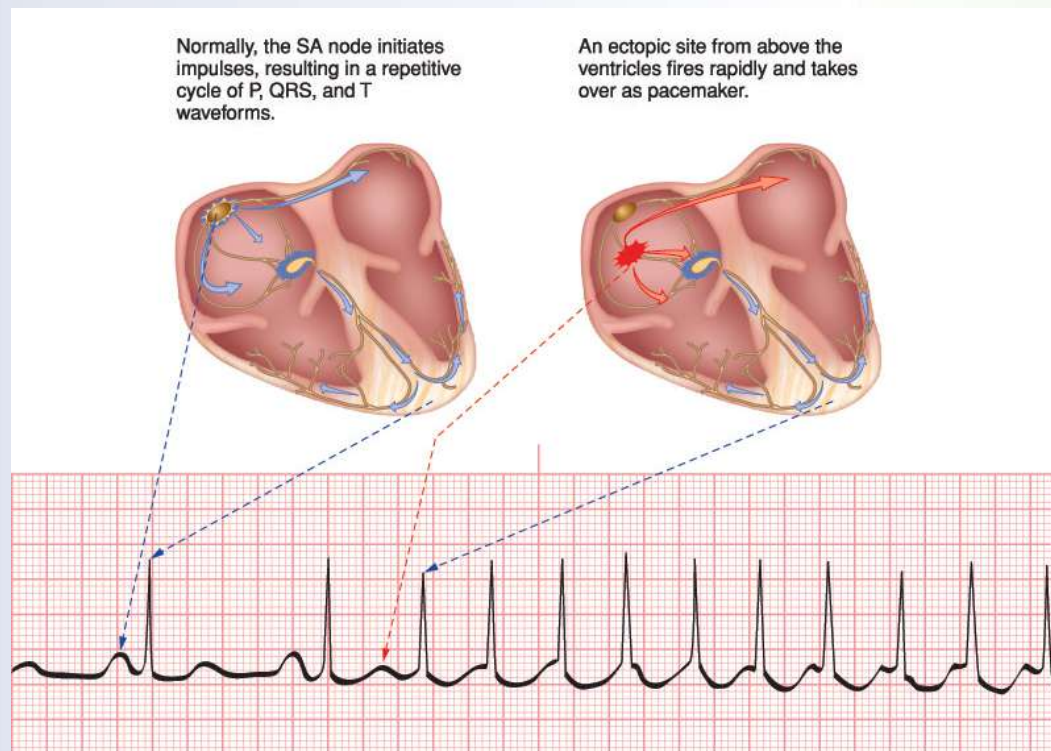
# Slightly Irregular

- Pacemaker changes location from site to site producing a slightly irregular rhythm
- Referred to as wandering atrial pacemaker



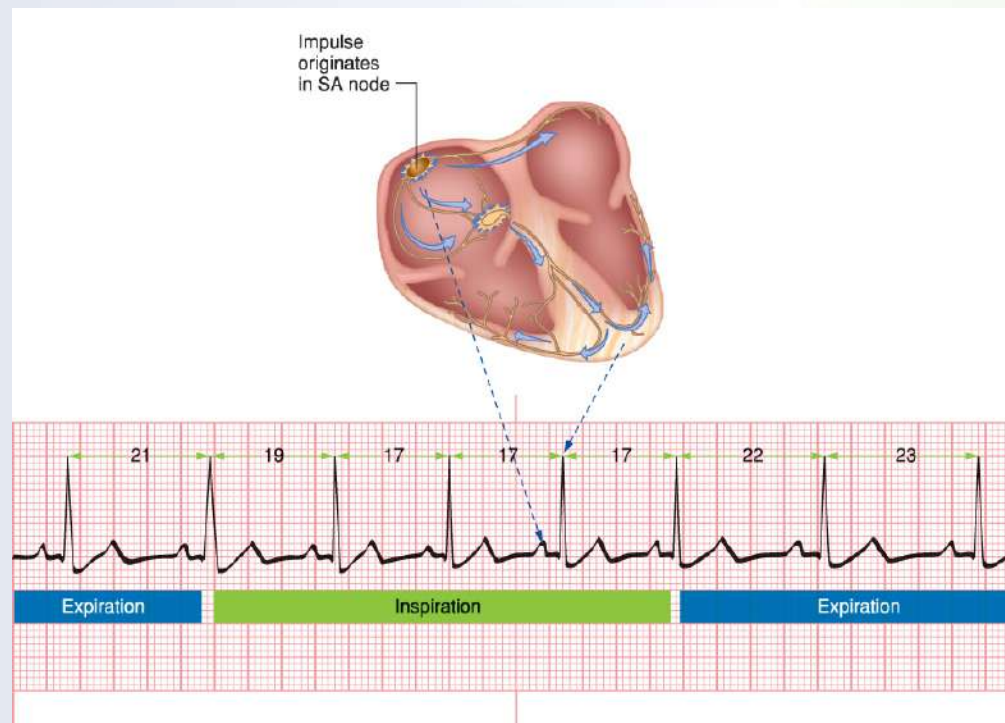
# Sudden Heart Rate Acceleration

- A normal rate that suddenly accelerates to a rapid rate producing an irregularity in the rhythm
- Referred to as paroxysmal tachycardia



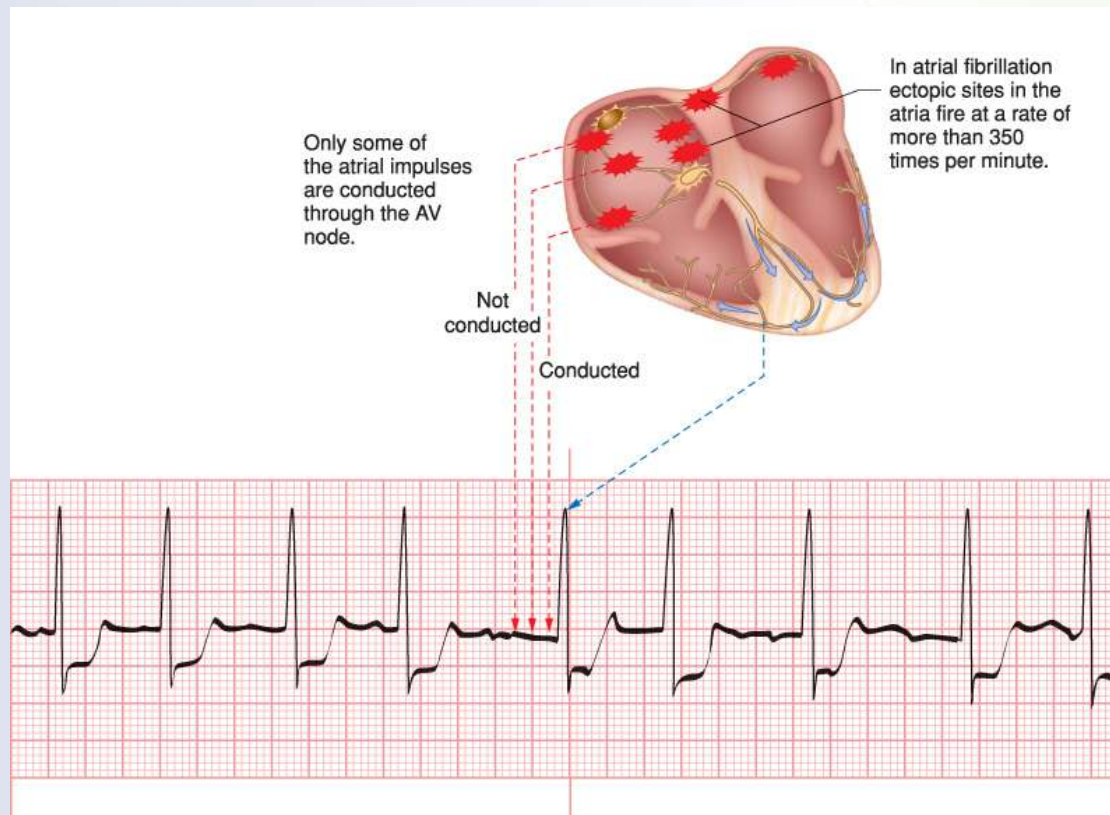
# Patterned Irregularity

- Irregularity repeats itself in a cyclic fashion
- Examples are sinus dysrhythmia, 2<sup>nd</sup>-degree AV heart block, Type I



# Totally Irregular

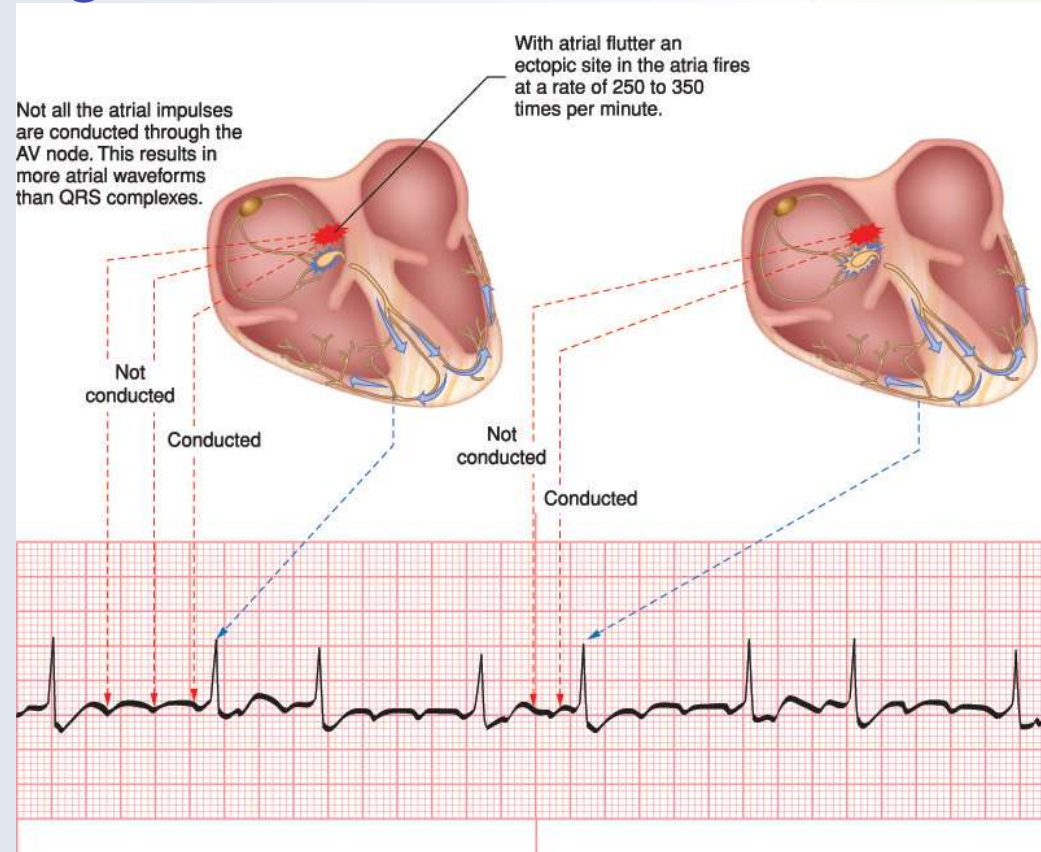
- No consistency to the irregularity
- Typically atrial fibrillation





# Another Type of Irregularity

- Irregularity can also be seen in dysrhythmias with a varying atrial to ventricular conduction ratio





# Practice Makes Perfect

- Determine the regularity



# Practice Makes Perfect

- Determine the regularity



# Practice Makes Perfect

- Determine the regularity





# Practice Makes Perfect

- Determine the regularity



# Practice Makes Perfect

- Determine the regularity





# Summary

- Determining regularity is the second step of analyzing an ECG rhythm.
- Irregular rhythms are considered abnormal and can be caused by a variety of conditions.
- If the distance of the R-R intervals or P-P intervals is the same, the rhythm is regular – if the distance differs, the rhythm is irregular.

# Summary

- Several methods can be used to determine rhythm regularity, including using calipers, marking a paper with a pen, and counting the small squares between each R-R interval.
- Irregularity may be occasionally irregular, very irregular, or slightly irregular.
- A normal rate that suddenly accelerates to a rapid rate produces irregularity in the rhythm.

# Summary

- Patterned irregularity is where the irregularity repeats in a cyclic fashion.
- A totally irregular rhythm has no consistency to the irregularity (atrial fibrillation).
- Irregularity can also be seen in dysrhythmias that have a varying atrial-to-ventricular conduction ratio.