1 **Rate Measurement**

2 **Six-Second Method**

- Ventricular rate
  - Count the number of complete QRS complexes within a period of 6 seconds
  - Multiply that number by 10 to determine the number of QRS complexes in 1 minute
- May be used for regular and irregular rhythms

3

4 **Large Box Method**

- Count the number of large boxes between two consecutive waveforms (R-R interval or P-P interval) and divide into 300
- Best used if the rhythm is regular

5 **Large Box Method**

6 **Small Box Method**

- Count the number of small boxes between two consecutive waveforms (R-R interval or P-P interval) and divide into 1500
- Time consuming, but accurate

7 **Sequence Method**

- Select an R wave that falls on a dark vertical line
  - Number the next 6 consecutive dark vertical lines as follows:
    - 300, 150, 100, 75, 60, and 50
  - Note where the next R wave falls in relation to the 6 dark vertical lines already marked—this is the heart rate

8 **Rhythm/Regularity**

9 **Rhythm/Regularity**

- When analyzing a rhythm strip, determine:
  - Atrial (P-P intervals) rhythm
  - Ventricular (R-R intervals) rhythm
- If the rhythm is regular, the R-R intervals (or P-P intervals if assessing atrial rhythm) are the same
  - Generally, a variation of plus or minus 10% is acceptable

10 **Terminology**

- Essentially regular rhythm
- Irregular rhythm
- Regularly irregular rhythm
- Irregularly irregular rhythm

11 **Analyzing a Rhythm Strip**

12 **Assess the Rate**

- What is the rate?
  - Determine ventricular rate (R-R intervals)
  - Determine atrial rate (P-P intervals)
- A “tachycardia” exists if the rate is greater than 100 bpm
- A “bradycardia” exists if the rate is less than 60 bpm

13 **Assess Rhythm/Regularity**

- Ventricular rhythm
  - Measure the distance between two consecutive R-R intervals
  - Compare with other R-R intervals

- Atrial rhythm
  - Measure the distance between two consecutive P-P intervals
  - Compare with other P-P intervals
- Variation of plus or minus 10% is acceptable

14 **Identify & Examine P Waves**

- Look to the left of each QRS complex
- Normally:
  - One P wave precedes each QRS complex
  - P waves occur regularly and appear similar in size, shape, and position

15 **PR Interval (PRI)**

- Measured from the point where the P wave leaves the baseline to the beginning of the QRS complex
- Normal PR interval is 0.12 to 0.20 second
- If the PR intervals are the same, they are said to be constant
- If the PR intervals are different, is there a pattern?
  - Lengthening
  - Variable (no pattern)

16 **QRS Complex**

- Identify the QRS complexes and measure their duration
  - Narrow (normal) if it measures 0.10 second or less
  - Wide if it measures more than 0.10 second

17 **QT Interval**

- Measure in the leads that show the largest amplitude T waves
  - Measured from the beginning of the QRS complex to end of the T wave
  - If the measured QT interval is less than half the R-R interval, it is probably normal

18 **ST Segment**

- Usually isoelectric in the limb leads
- To determine ST segment elevation or depression, measure at a point 0.04 second (one small box) after the end of the QRS complex
  - Use the PR segment as the baseline

19 **T Waves**

- Are the T waves upright and of normal height?
- The T wave following an abnormal QRS complex is usually opposite in direction of the QRS
- Negative T waves suggest myocardial ischemia
- Tall, pointed (peaked) T waves are commonly seen in hyperkalemia