

EKG Refresh and Practice

Normal Sinus Rhythm

- Rate: 60 – 100 beats per minute
- Rhythm: Atrial - Regular
Ventricular – Regular
- P waves: Uniform in appearance
Upright w/ normal shape
One preceding each QRS
Nor more than .10 second
- PR interval: 0.12 – 0.20 second
- QRS: 0.10 second or less

P-Waves:

Should be no more than 2.5 mm in height, and no more than .10 second in width

PR Interval:

Includes the p-wave as it leaves the baseline and ends at the beginning of the QRS complex

QRS Complex:

Measured from the beginning of the QRS complex (as the first wave leaves the baseline) to the end of the QRS complex (when the last wave begins to level out into the ST segment). The end of the QRS complex is called the J-point.

Normally positive in lead II

ST Segment:




Begins with the end of the QRS complex and ends with the onset of the T-wave. Normally flat. Considered elevated if it is above the baseline and depressed if it is below the baseline. An elevated ST segment is a sign of myocardial infarct.

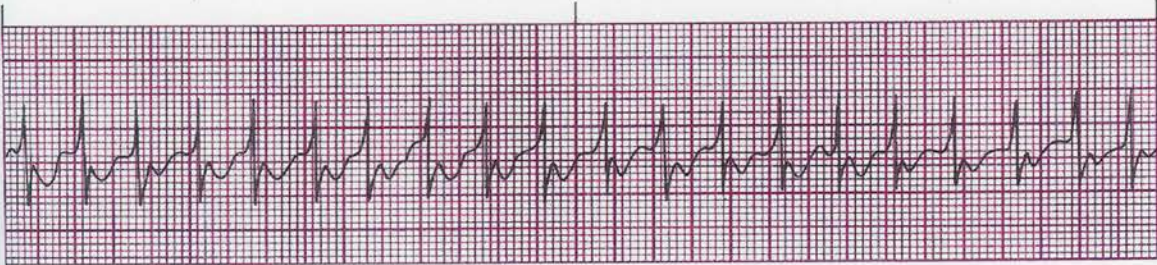
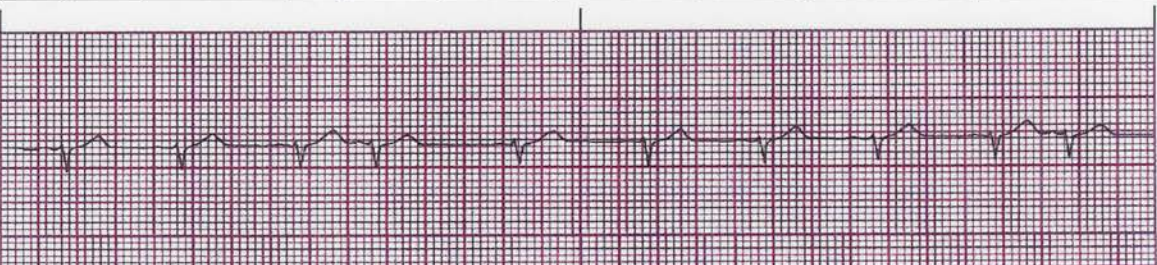
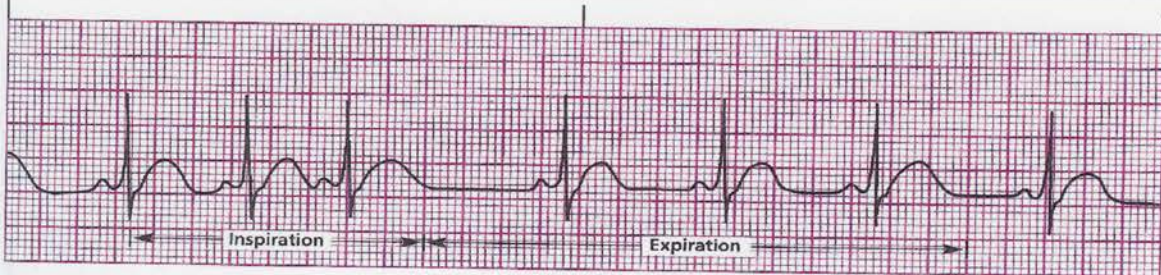
T-Wave:

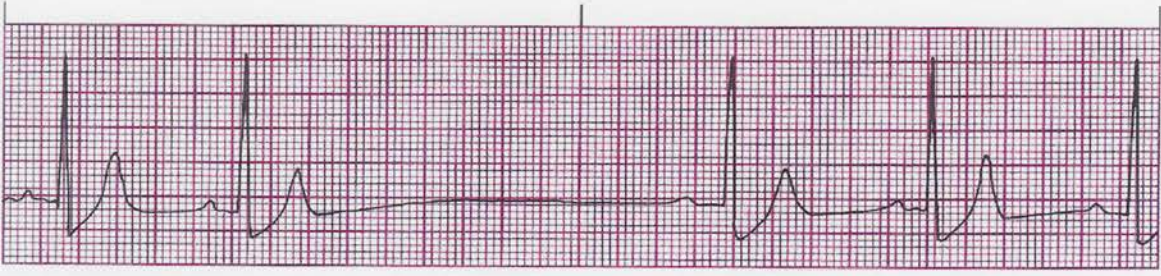
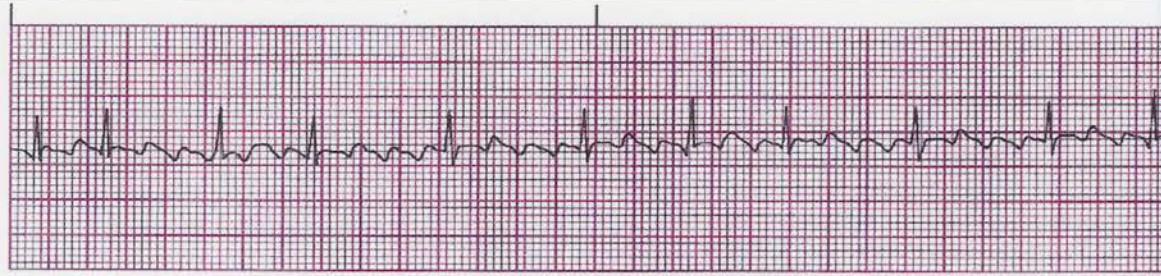

Begins as the deflection gradually slopes upward from the ST segment and ends when the waveform returns to baseline. Should be positive in a Lead II.

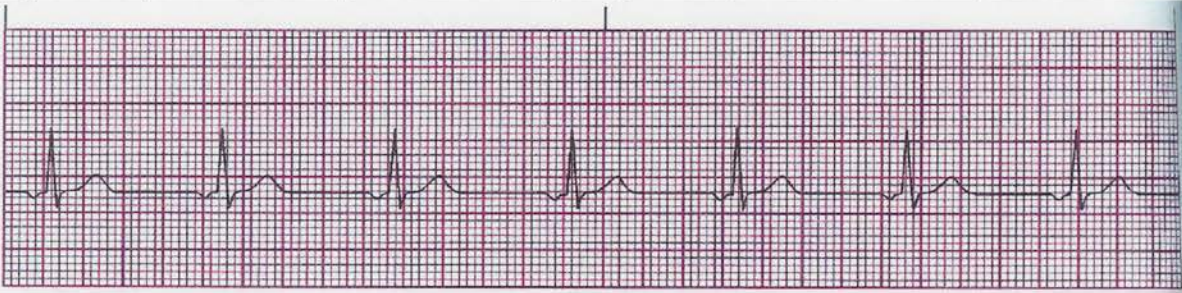
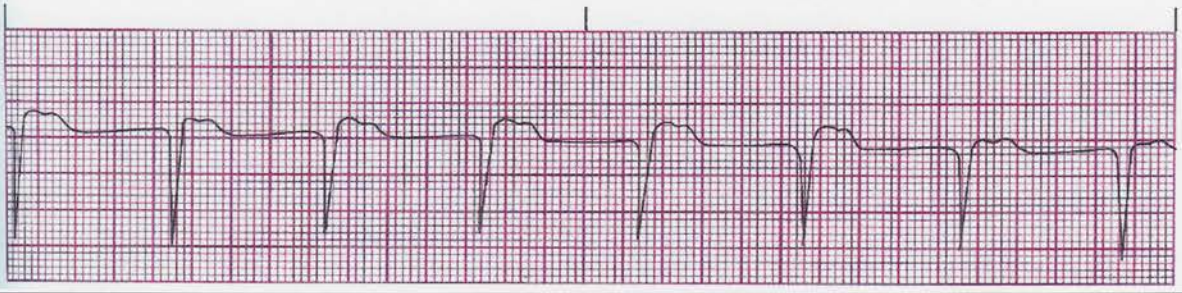
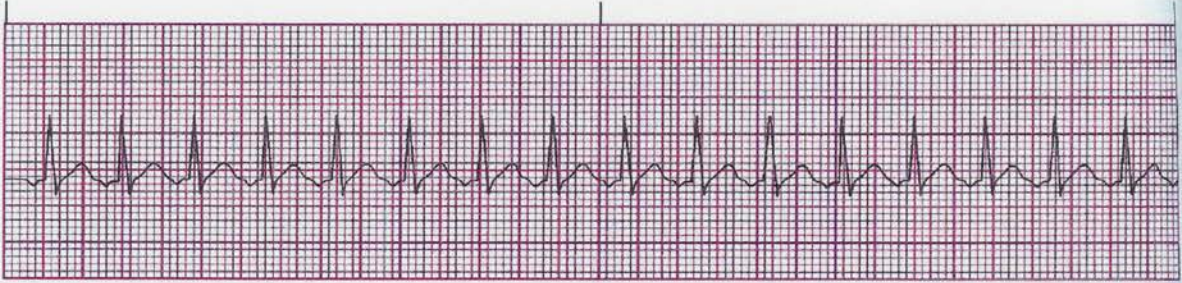
Analyzing a Rhythm Strip

- What is the rate?
- Is it regular or irregular?
- If irregular, is there a pattern of irregularity?
- Are there P-waves? ...are they all the same?
- If so, is the P-R interval of normal length and are they all the same?
- Is there only one P-Wave for every QRS complex?

Rhythm	Regularity	Rate	P Waves	QRS Complex
Normal Sinus Rhythm (NSR)	Regular	60 to 100	Positive; Rounded; Normal PR Interval; One P wave for each QRS complex	Narrow
				
Sinus Bradycardia	Regular	Less than 60	Positive; Rounded; Normal PR Interval; One P wave for each QRS complex	Narrow
				
Sinus Tachycardia	Regular	100 to 170	Positive; Rounded; Normal PR Interval; One P wave for each QRS complex	Narrow
				

Rhythm	Regularity	Rate	P Waves	QRS Complex
Supraventricular Tachycardia (SVT)	Regular	Over 170	Not visible, though may be present burried in QRS complex or T waves	Narrow
				
Premature Atrial Contraction (PAC)	Regular with Isolated Anomaly	That of Underlying Rhythm	Positive; Rounded; Normal PR Interval; One P wave for each QRS Complex	Narrow
				
Sinus Arrhythmia	Irregular	60 to 100	Positive; Rounded; Normal PR Interval; One P wave for each QRS Complex	Narrow
				

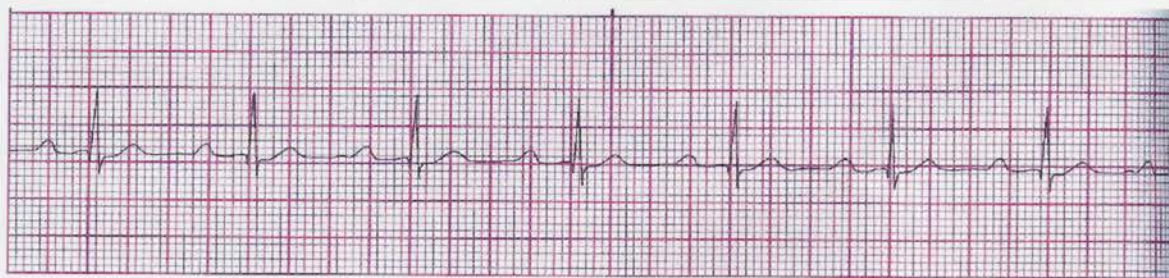
Rhythm	Regularity	Rate	P Waves	QRS Complex
Sinus Block or Sinus Arrest	Regular with Sudden Pause	60 to 100	Positive; Rounded; Normal PR Interval; May see one non-conducting P before pause	Narrow
				
Atrial Flutter	Regular or Irregular	Atrial: 250-400; Ventricular usually 60-100	Positive; Peaked or "Sawtooth" Appearance to Baseline; Unable to measure PR Interval	Narrow
				
Atrial Fibrillation	Irregular	Atrial: No coordinated systole; Ventricular usually 60-100	None; Wavy deflections affecting baseline as atria quiver	Narrow
				

Rhythm	Regularity	Rate	P Waves	QRS Complex
Junctional Rhythm	Regular	40 to 60	Inverted; May occur before/after QRS complex or be hidden	Narrow
				
Accelerated Junctional	Regular	60 to 100	Inverted; May occur before/after QRS complex or be hidden	Narrow
				
Junctional Tachycardia	Regular	More than 100	Inverted; May occur before/after QRS complex or be hidden	Narrow
				

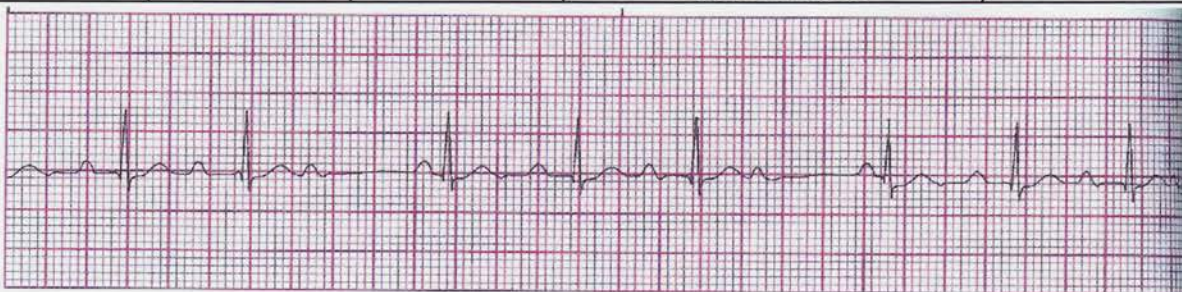
Rhythm	Regularity	Rate	P Waves	QRS Complex
Premature Junctional Contraction (PJC)	Usually Regular with Isolated Anomaly	That of Underlying Rhythm	That of Underlying Rhythm; PJC will have Inverted or hidden P wave	Narrow



1° AV Block	Regular	That of Underlying Rhythm; Usually 60 to 100	Positive; Rounded; PR Interval more than 0.20sec; One P wave for each QRS Complex	Narrow
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2° AV Block, Mobitz I (Wenckebach)	Regularly Irregular	Usually 60 to 100, May be Bradycardic	Positive; Rounded; PR Interval WNL at first but lengthens progressively until P does not conduct to QRS	Narrow
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Rhythm	Regularity	Rate	P Waves	QRS Complex
2° AV Block, Mobitz II	Usually Regular, May be Irregular	Atrial: Varies, Ventricular: Usually Less Than 60	Positive; Rounded; PR Interval for conducting beats is always WNL; More than 1 P wave for each QRS Complex	Usually Narrow



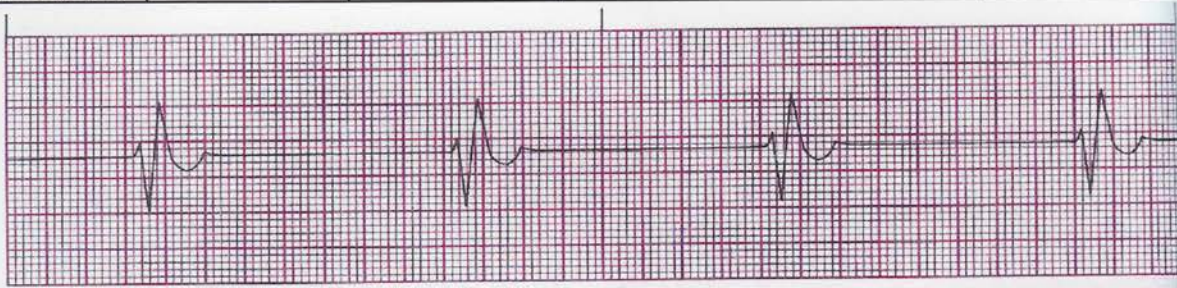
3° AV Block (Complete Heart Block)	Atrial and Ventricular Regular but not Corresponding	Atrial: 60 to 100, Ventricular: Usually 20-40	Positive; Rounded; Unable to Measure PR Interval; P:QRS Ratio variable; P waves may be hidden in QRS or T waves	Typically Widened
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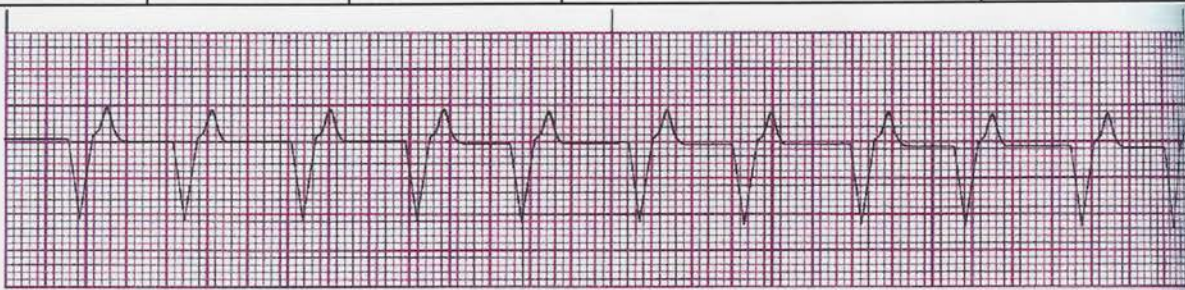
Bundle Branch Block	That of Underlying Rhythm	That of Underlying Rhythm	Positive; Rounded; Normal PR Interval; One P wave for each QRS Complex	Borderline Wide: 0.10-0.14 sec; Usually Notched (QRR'S)
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Rhythm	Regularity	Rate	P Waves	QRS Complex
Idioventricular Rhythm (IVR)	Regular	20 to 40	Absent	Wide

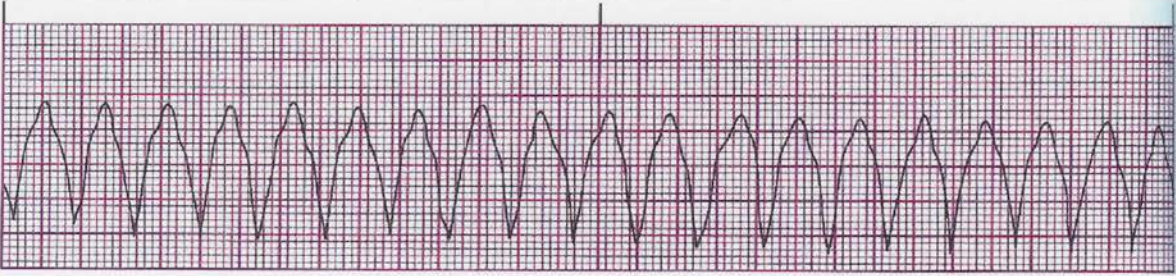



Accelerated IVR	Regular	40 to 100	Absent	Wide
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Premature Ventricular Contraction (PVC)	That of Underlying Rhythm with Isolated Anomaly	That of Underlying Rhythm	That of Underlying Rhythm; No P Wave Preceding PVC	That of Underlying Rhythm; PVC Wide and May Have Opposite Deflection from Underlying Rhythm
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Rhythm	Regularity	Rate	P Waves	QRS Complex
Ventricular Tachycardia	Regular	100 to 250	Usually Absent; If Present Will Not Correlate with QRS Complex	Wide; QRS Adjacent to QRS or Only T Waves Visible Masking Baseline
				
Ventricular Fibrillation	Irregular	Zero	No Coordinated Systole; Wavy Deflections Affecting Baseline as Ventricular Quiver	Absent
				
Asystole	None	Zero	Lack of Electrical Activity; Baseline Usually Flat or Nearly Flat (Mild Deflections Will Be Less Than 2mm in Height)	Absent
