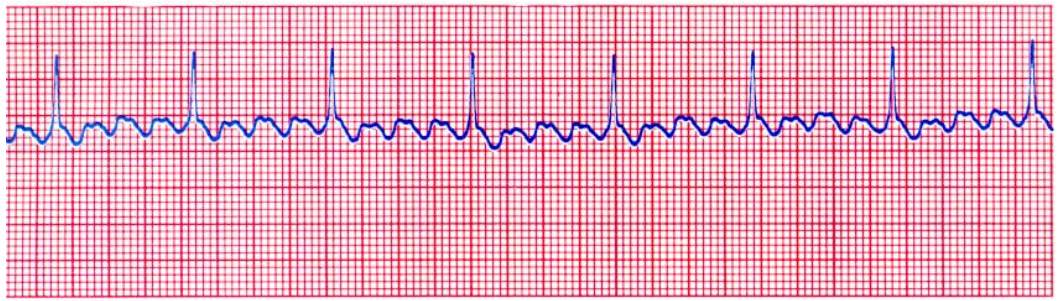
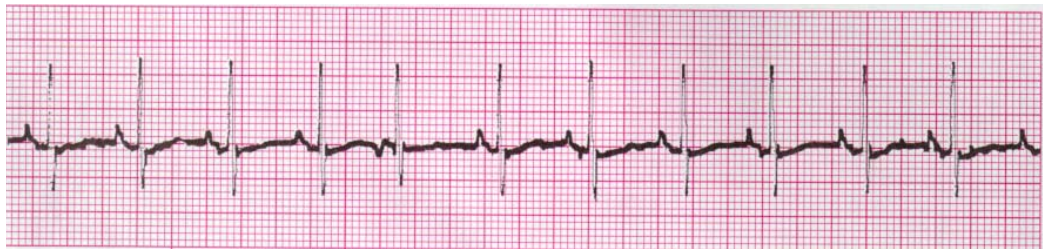
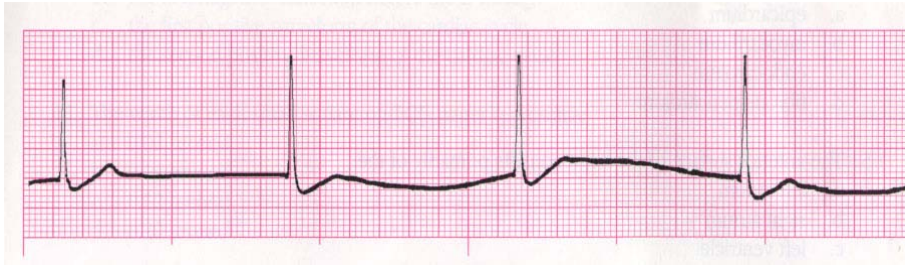
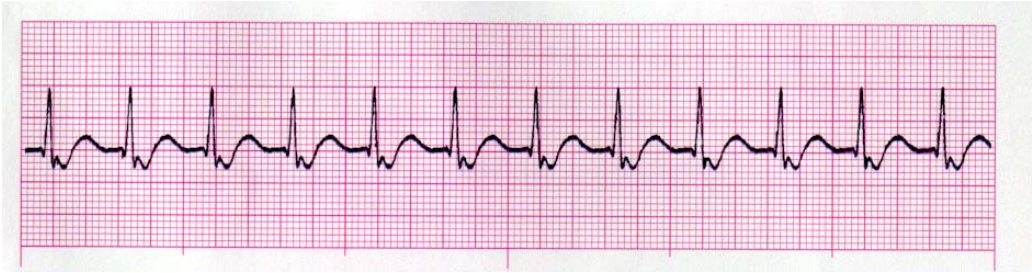
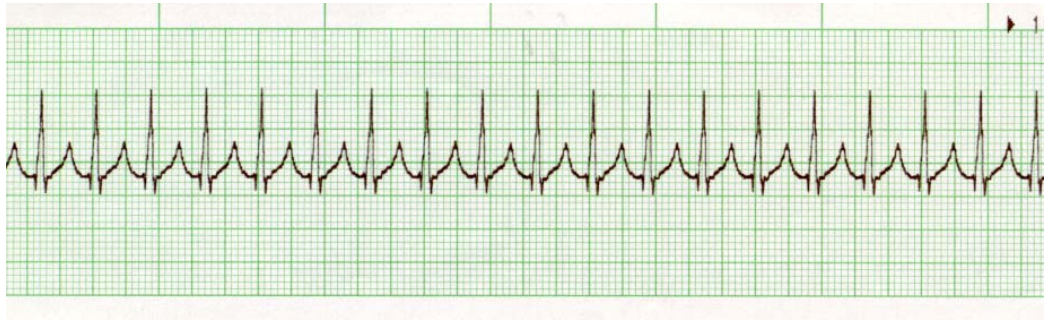
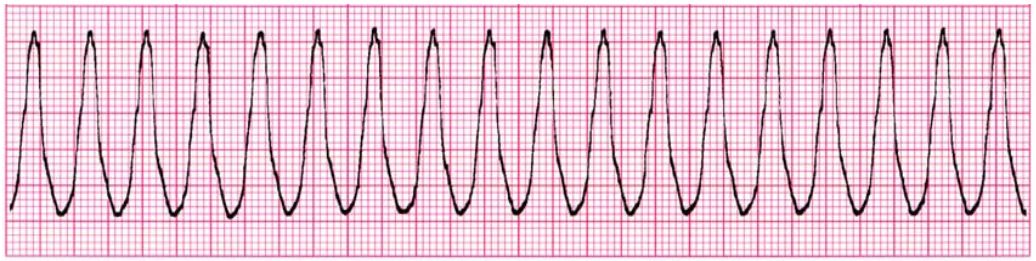
Rhythm	ECG Characteristics	Example
Normal Sinus Rhythm (NSR)	**Rate:** 60-100 per minute **Rhythm:** R- R = **P waves:** Upright, similar **P-R:** 0.12 -0 .20 second & consistent **qRs:** 0.04 – 0.10 second **P:qRs:** 1P:1qRs	
Sinus Tachycardia Causes: ❑ Exercise ❑ Hypovolemia ❑ Medications ❑ Fever ❑ Hypoxia ❑ Substances ❑ Anxiety, Fear ❑ Acute MI ❑ Fight or Flight ❑ Congestive Heart Failure	**Rate:** > 100 **Rhythm:** R- R = **P waves:** Upright, similar **P-R:** 0.12 -0 .20 second & consistent **qRs:** 0.04 – 0.10 second **P:qRs:** 1P:1qRs	
Sinus Bradycardia Causes: ❑ intrinsic sinus node disease ❑ increased parasympathetic tone ❑ drug effect.	**Rate:** < 60 **Rhythm:** R- R = **P waves:** Upright; similar **P-R:** 0.12 -0 .20 second & consistent **qRs:** 0.04 – 0.10 second **P:qRs:** 1P:1qRs	

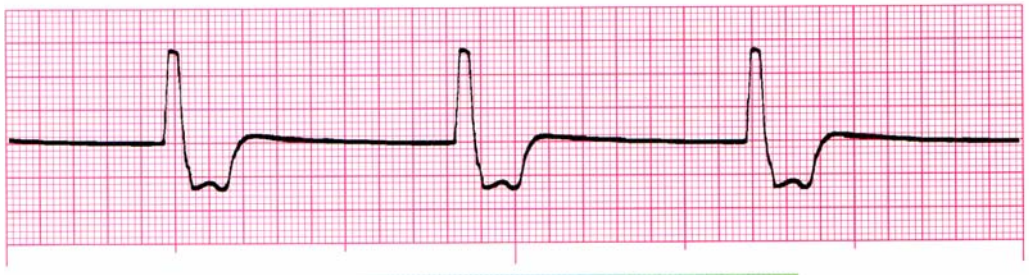
Rhythm	ECG Characteristics	Example
Premature Atrial Contractions (PAC) Causes: ❑ normal ❑ excessive use of caffeine, tobacco, or alcohol ❑ CHF ❑ Myocardial ischemia or injury ❑ Hypokalemia, Dig toxicity ❑ COPD	**Rate:** usually < 100, dependant On underlying rhythm **Rhythm:** irregular **P waves:** Early & upright, different from Sinus **PR:** 0.12 – 0.20 second; different from Sinus **qRs:** 0.04 – 0.10 second **P:qRs** = 1:1	
Atrial Flutter Causes: ❑ ischemic heart disease ❑ Hypoxia ❑ Acute MI ❑ Dig Toxicity ❑ Mitral or Tricuspid valve disease ❑ Pulmonary embolism	**Rate:** Atrial rate 250-350 Vent 150 common **Rhythm:** Atrial = Regular Vent = Reg. or irreg **P waves:** Not identifiable **F waves:** Uniform (sawtooth or picket fence) **PRI:** not measurable **qRs:** 0.04 – 0.10 second	
Atrial Fibrillation ❑ Ischemic heart disease ❑ Hypoxia ❑ Acute MI ❑ Digitalis toxicity ❑ Mitral or tricuspid disease	**Rate:** Atrial: 400-700 Vent. 160-180/minute **Rhythm:** Atrial: irregular; Vent.: irregular **P waves:** No identifiable Ps **f waves:** may be seen. **PRI:** unable to measure (No identifiable P) **qRs:** usually normal	

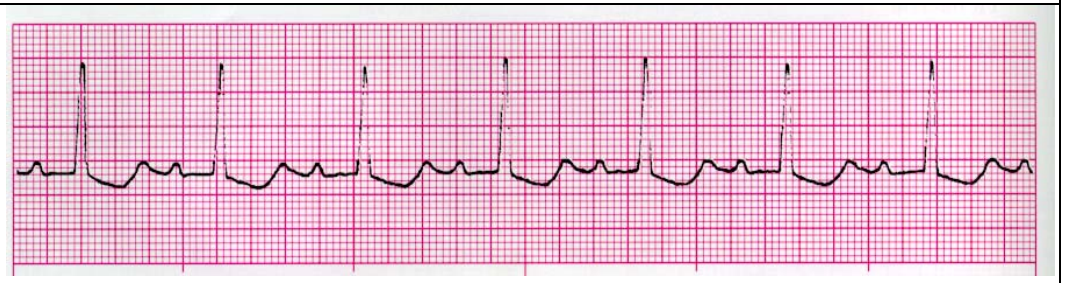
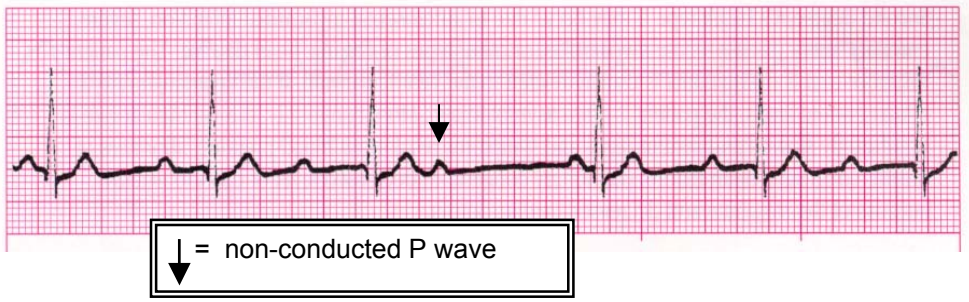
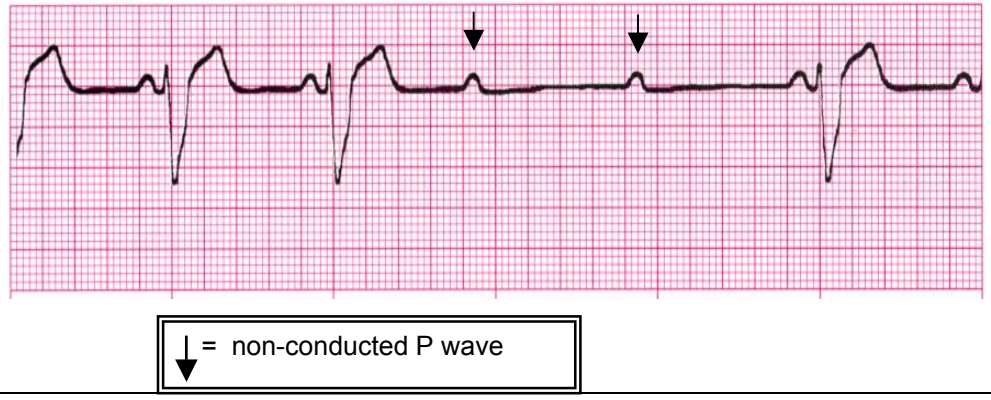
Rhythm	ECG Characteristics	Example
Paroxysmal Atrial Tachycardia Causes: ❑ Same as PACs	**Rate:** usually 160-220 **Rhythm:** Regular **P waves:** differ in shape from Sinus Ps; usually difficult to identify (rate related) **PR Interval:** Normal when the Ps can be identified; short if WPW present **qRs:** usually normal **Other:** Onset sudden, often initiated by a PAC	
Premature Junctional Contraction (PJC) Causes: ❑ Same as PACs	**Rate:** usually < 100, dependant on the underlying rhythm **Rhythm:** irregular **P waves:** Inverted before or after qRs or not visible **PR interval:** < 0.12 second when inverted P is before qRs **qRs:** 0.04 – 0.10 second **P:qRs** = 1:1 if Ps are visible	

Rhythm	ECG Characteristics	Example
Junctional escape Rhythm Causes: ❑ healthy athlete at rest ❑ related to medications- Beta Blockers, Calcium Channel Blockers, Dig Toxicity ❑ or increased parasympathetic tone ❑ Acute Inferior Wall MI ❑ Rheumatic Heart Disease ❑ Post-Cardiac Surgery ❑ Valvular Disease ❑ SA Node Disease ❑ Hypoxia	**Rate:** 40-60 61 – 100 (accelerated) **Rhythm:** Regular **P waves:** Inverted before or after qRs or not visible **PR interval:** < 0.12 second when inverted P is before qRs **qRs:** 0.04 – 0.10 second **P:qRs** 1:1 if Ps are visible	
Junctional Tachycardia Causes: ❑ Same as Paroxysmal Atrial Tachycardia (PAT)	**Rate:** 101-200 Same as Junctional Escape Rhythms.	
Supraventricular Tachycardia (SVT) An umrella term used when unable to distinguish which rhythm is present. Causes: Same as Sinus, Atrial, and Junctional Tachycardia, and Atrial Flutter	**Rhythm:** Absolutely regular **Rate:** > 150 per minute **P Waves:** Not visible (PRI not measurable) **qRs:** **normal** 0.04 – 0.10 sec	

Rhythm	ECG Characteristics	Example
Premature Ventricular Complex (PVC) Causes: ❑ Gastric overload ❑ Stress ❑ Caffeine, Alcohol, Nicotine ❑ Heart Disease ❑ Acid-Base Imbalance ❑ Electrolyte Imbalance ❑ Cyclic Antidepressants ❑ Hypoxia ❑ Acidosis ❑ Acute MI	**Rate:** Dependent upon underlying rhythm **Rhythm:** R – R ≠ **P waves:** Usually absent, if present, not associated with PVC **qRs:** 0.12 second or greater; bizarre and notched **ST & T:** Often opposite in direction to the qRs. **Timing** One on a strip = Rare One in a row = Isolated Two in a row = Pair, couplet Three in a row = V Tachycardia **Pattern** Every other = Bigeminy Every third = Trigeminy **Morphology** Similar shape = Uniformed Different shape = Multiformed **Location** R – on – T = PVC falls on the T wave of the complex before the PVC	

Rhythm	ECG Characteristics	Example
Ventricular Tachycardia Causes: ❑ Same as PVCs ❑ R on T Phenomenon	**Rate:** > 100 per minute and usually not > 220 **Rhythm:** Usually regular **P Waves:** ∅ P waves or if present, not associated with qRs **qRs:** Wide (≥ 0.12 sec), bizarre **ST/T wave:** Opposite direction of qRs A group of three PVCs in a row or more at a rate greater than 100/ minute or more constitutes Ventricular Tachycardia.	
Ventricular Fibrillation Causes: ❑ Acute Myocardial Infarction ❑ Untreated Ventricular Tachycardia ❑ Hypothermia ❑ R-on-T PVCs ❑ Electrolyte imbalance ❑ Electrical shock	**Rate:** ∅ **Rhythm:** ∅ regularity, chaotic undulating waves **P Waves:** ∅ **qRs:** ∅ **ST/T Wave:** ∅ **Organized activity:** ∅ No Cardiac Output or Pulse	

Rhythm	ECG Characteristics	Example
Idioventricular Rhythm Causes: ❑ Myocardial Infarction ❑ Digitalis toxicity ❑ Metabolic imbalances ❑ Post resuscitation rhythm	**Rate:** 20-40 per minute **Rhythm:** R – R = **P waves:** No P waves associated to qRs **qRs:** > 0.12 sec, notched, bizarre appearance **ST/T :** Opposite direction of qRs Rate > 40 to 100 = Accelerated	
Asystole Causes: ❑ Extensive myocardial damage ❑ Acute respiratory failure ❑ Ischemia or Infarction ❑ Traumatic cardiac arrest ❑ Ventricular aneurysm ❑ Countershock ❑ Hypoxia, Hypothermia ❑ Hyperkalemia, Hypokalemia ❑ Preexisting acidosis ❑ Drug overdose	**Rate:** Ventricular rate = 0 **Rhythm:** ∅ unless Ps are present, then regular or irregular **P waves:** may be present **qRs:** ∅ **P:qRs** ∅	 

Rhythm	ECG Characteristics	Example
1st degree AV Block	◆ 1P : 1 qRs ◆ Prolonged PRI (> 0.20 sec not > 0.40 sec)	
2nd degree AV Block, Type I	◆ More P waves than qRs ◆ PRI progressively increases in a cycle until P appears w/o qRs. ◆ Cyclic pattern reoccurs ◆ R – R ≠	
2nd degree AV Block, Type II	More P waves than qRs ◆ PRI consistent ◆ qRs normal or wide (bundle branch block) ◆ R - R≠ or R – R =	

Rhythm	ECG Characteristics	Example
3rd degree AV Block	◆ More P waves than qRs ◆ P not r/t qRs (P too close, P too far) ◆ PRI varies greatly ◆ qRs normal or wide ◆ R – R =