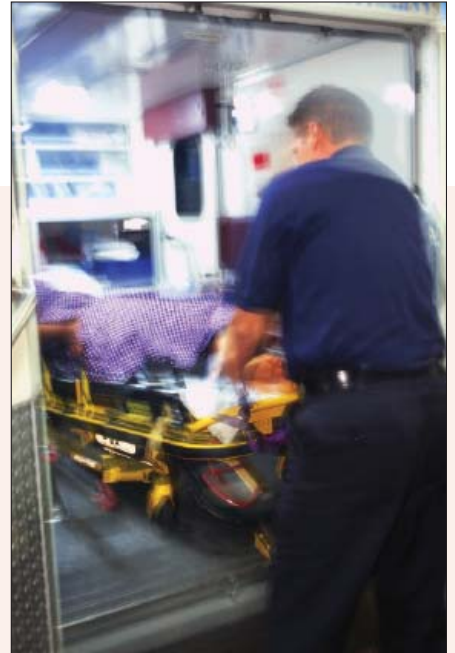


**Study Guide for
Advanced Cardiac
Life Support
HeartCode™ System**



Disclaimer:

This document is solely produced by Huntsville Hospital based on the American Heart Association 2010 Guidelines. However, this ACLS review does not warrant or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, or process disclosed.

Dear ACLS Renewal Course student:

Welcome to the ACLS Renewal with HeartCode computer system course.

HOW TO GET READY:

HeartCode System is a computerized, self-paced learning experience that, when completed, results in a AHA ACLS card for renewal purposes.

Prior to attending the class, you will need to review the following study guide and pass an online ACLS PRETEST.

To access the test, go to www.heart.org/eccstudent, type “compression” in the window, click ‘submit’, choose “pre-course Self assessment” and proceed with the test.

Students will receive BLS Healthcare Provider Renewal certification during their ACLS course. Please prepare by reviewing the BLS study Guide. You will have to demonstrate your BLS skills and take the written exam.

AHA ACLS Heartcode sessions are offered Monday thru Thursday and last approximately seven hours.

If you have any questions, please call 256.265.8025.

SCENARIOS

RESPIRATORY DISTRESS

A/

You have just walked into a room of a 69 year-old male who is a 4-pack-per-day smoker. His wife says that he has been short of breath the last few days and quit breathing one minute ago. He has been on a ventilator in the past. Describe how you would direct the management of this patient.

B/

A 60-year-old female who underwent a Bronchoscopy 24 hours earlier complains of increased chest pain. When the nurse leaves the room to consult a physician, the patient presses her call button again. The doctor enters a few minutes later and finds her lying in bed unconscious and unresponsive. Describe what the doctor should do immediately. How should she direct the other rescuers as they enter the room.

BRADYCARDIA

A/

A 67-year-old female who has had chest pain for 2 hours, has just been admitted at the ED. She presses the call button because she feels nauseated. She is pale and sweaty. Describe how you would direct the management of this patient.

B/

You are on duty as a nurse in the ED. A 59-year-old female with unstable angina is being admitted by her general practitioner. She slumps onto the bed drowsy, pale, and sweaty. Describe your care for this patient.

SUPRA VENTRICULAR TACHYCARDIA

A/

A 62-year-old male comes to the ED complaining of palpitations. Nurse finds him alert, friendly, and complaining of palpitations but dyspnea or chest pain. Physical examination reveals a heart rate of 184 beats per minute, and blood pressure 118/72 mm Hg. Lungs are clear. There are no carotid bruits. The ECG monitor shows SVT. Describe the proper treatment for this patient.

B/

A 35-year-old male enter the ED complaining of being awakened by a rapid heart rate and a pounding headache that won't go away. He has no chest pain or shortness of breath. Physical examination shows a blood pressure of 130/80 mm Hg, a heart rate of 190 beats per minute, a clear chest, and no carotid bruits. The ECG monitor shows SVT. Describe the proper management for this patient.

ATRIAL FIBRILLATION

A/

While working on the medical floor, you are asked to see a 49-year-old female with pneumonia who complains that her heart is beating rapidly. She is alert and oriented and has no chest pain or dyspnea. Her heart rate is 160 and irregular. Her blood pressure is 150/90 mm Hg. Her lungs are clear. There are no carotid bruits. A 12-lead ECG shows no ischemia. A monitor tracing shows an irregular rhythm that you identify as rapid atrial fibrillation. Describe how you would direct care management of this patient.

B/

A 35-year-old male has just reported palpitations. He mentions a similar sensation followed by a syncopal episode 6 months ago. He denies having chest pain, chest discomfort, shortness of breath, dizziness, or abnormal sweating. He is alert and his mental status is normal. His blood pressure is 130/80 mm Hg, and his pulse is 167 irregular rhythm. The lungs are clear. There is no carotid bruits. Describe how you would manage the proper care of this patient.

VENTRICULAR TACHYCARDIA WITH PULSE

A/

A 58-year-old male returns to the surgical floor after an operation for a bowel obstruction. He is known to have angina and takes β -blockers daily. He complains of severe chest pain, shortness of breath, and a feeling of apprehension. (*Rhythm is V/T*). Describe the proper management of care for this patient.

B/

A 60-year-old male is admitted to the critical care unit for unstable angina. The monitor alarm is activated. The patient states that he is having palpitations, chest pain, and shortness of breath. He states that he feels very light-headed. (*The rhythm is torsades of pointes*). Describe how you would direct the management of this patient.

VT WITH A PULSE

A/

A 75-year-old complaining of weakness with shortness of breath. Patient is brought in from nursing home by staff. Patient able to seat up in chair, skin color pale dry, respiratory rate 20, no distress. Patient taken to ED bed, monitor placed on patient showing VT with pulse. What is the proper management for this patient?

B/

A 45-year-old female presents to the ED complaining of palpitations, difficulty breathing, and severe pressure in her chest. She complains of extreme weakness and says she feels like she is going to faint. (*The rhythm is VT*). Describe what the proper treatment plan is for this patient.

ACUTE ISCHEMIC STROKE

A/

A 68-year-old male complaining of post headache being the worst ever. Thirty minutes prior to arrival, patient fell onto the floor while trying to get out of a chair. On their arrival eyes are open, speech slurred. No grips, no movement on the left side. The wife attempted to give him a drink unsuccessfully, drooling out of the left side of his mouth with left side facial droop. Describe how you would direct the proper management of this patient.

B/

Transient weakness on an off to right extremities. Patient lying in bed in the ED, patient pulling his right side in toward himself, altered mental state, unable to speak, no eye contact. Patient now unable to move right side, remains confused with incomprehensible sounds, and has right side facial droop. Describe the proper treatment for this patient.

VF / PULSELESS VT

A/

A 60-year-old female who underwent a cholecystectomy 24 hours earlier complains of increased abdominal pain. When the patient presses her call button a few times you walk in and find the patient unconscious and unresponsive. Describe how you would manage treatment of this patient.

B/

A 72-year-old female is admitted to the CCU from the ED. She has been complaining of severe chest pain that is unrelieved by nitroglycerin. She notices an increase in her pain, and the ECG monitor alarm sounds. The patient crumples back on the bed unconscious and unresponsive. The bedside ECG monitor shows VF. Describe the proper management of this patient.

PULSELESS ELECTRICAL ACTIVITY

A/

A 37-year-old female with a history of smoking has severe chest pain. You are admitting her at bedside. You ask her about her medications and she tells you oral contraceptives. You look over to ask another question and find the patient unresponsive. Describe how you would manage this patient. (Possible massive pulmonary embolus). Monitor showing sinus tachycardia without a pulse.

B/

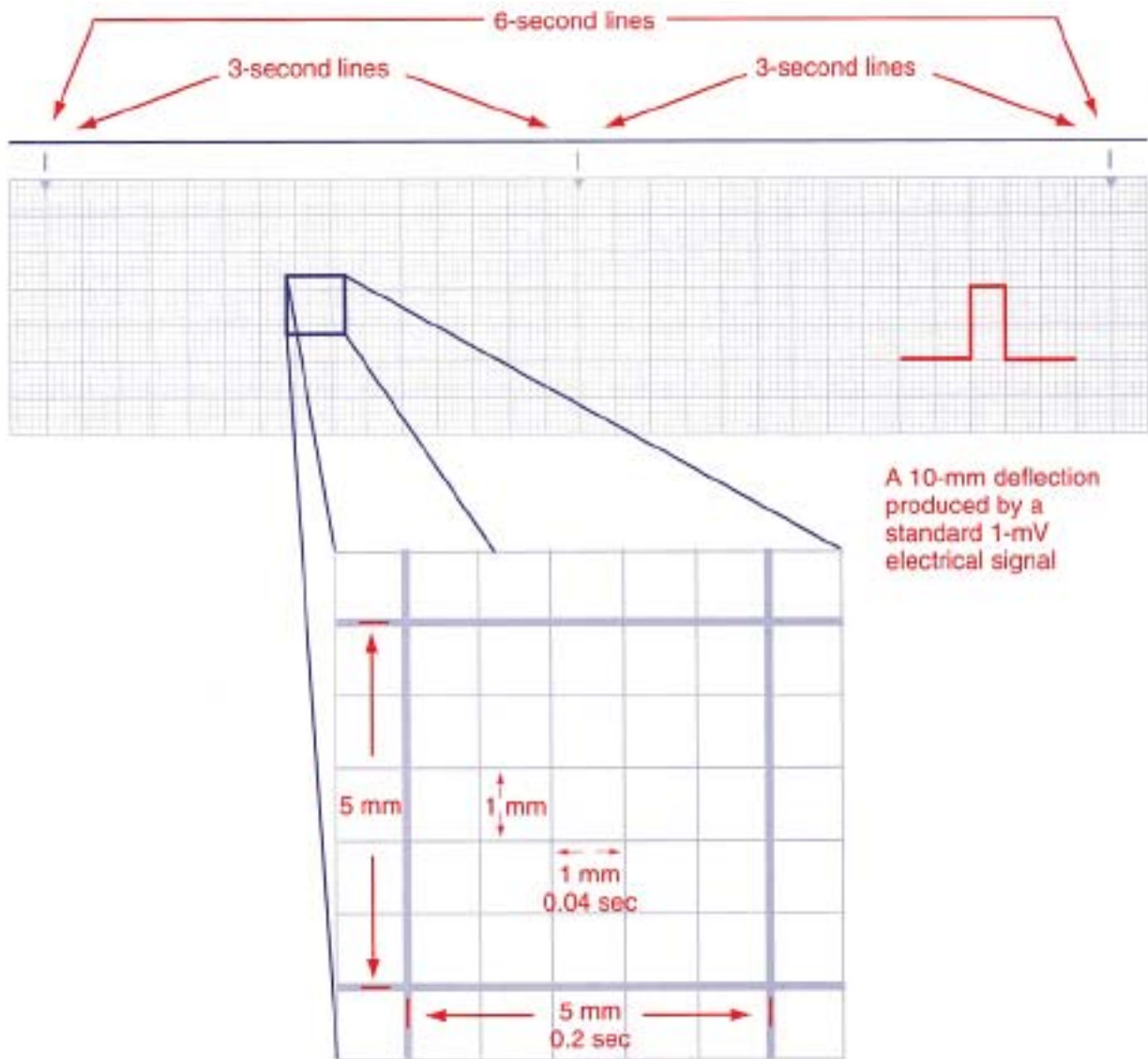
A 55-year-old male walks into the ED complaining of severe chest and abdominal pains. He is placed in a stretcher and begins to remove his clothes. Just as the nurse starts to attach the monitor leads, he falls back unconscious on the stretcher (possible hypovolemia from gastrointestinal bleeding or other causes or acute MI). Monitor showing sinus tachycardia without a pulse. Describe how you will manage proper care of this patient.

ASYSTOLE

A/
Relatives have brought a 64-year-old female into the ED after she collapsed in the hospital parking lot. Hospital personnel have started CPR, but no ACLS intervention has been initiated. You overhear a relative say the woman was on her way to her last oncology clinic appointment. Describe the proper treatment of this patient.

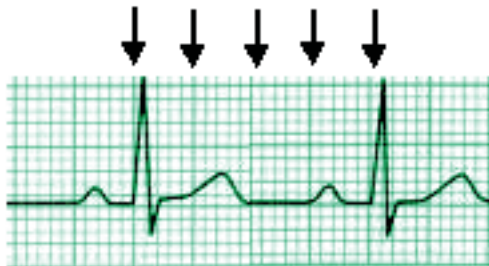
B/
A 55-year-old male is admitted to the CCU with an acute myocardial infarction. The monitor alarm sounds, and the screen shows progressive bradycardia. When the nurse responding to the cardiac monitor enters the room, she finds the patient unresponsive. Explain the proper management for this patient.

EKG PRACTICE TEST



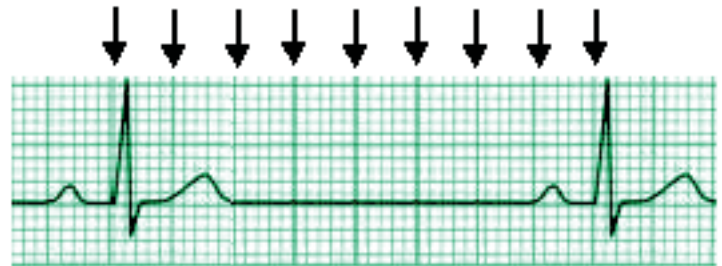
Normal Sinus Rhythm

Start 300 150 100 75



Sinus Bradycardia

Start 300 150 100 75 60 50 43 38



AV-BLOCKS

AV Block	Heart-Rate (ventricular)	Rhythm	P-wave	PR Interval	QRS Interval
1°	Varies	Regular	Normal 1.1	>0.20	<0.12
2° Type I	Varies	Irregular	Abnormal more P than QRS	Progressive increase until QRS dropped	<0.12
2° Type II	Varies 40-80	Regular or Irregular	More P than QRS	Constant	<0.12
3°	Varies 40-80	Regular	More P	No relationship	Not measured

ECG INTERPRETATION

Five Rules

1. Rate
2. Rhythm
 - a. Regularly Irregular
 - b. Occasionally Irregular
 - c. Irregularly Irregular
3. P Wave
 - a. Present, Upright & Regular?
 - b. P for every QRS
 - c. QRS for every P
4. PRI
 - a. Within Normal Limits (.12-.20)
 - b. Constant?
5. QRS
 - a. Wide? (>.12)
 - b. Appear Similar?

SINUS RHYTHMS {P WAVES}		
NSR	Normal Sinus Rhythm	Regular/60-100/P's upright, 1:1, Look the same/PRI .12-.20/QRS, .12
ST	Sinus Tachycardia	Heart Rate greater than 100
SB	Sinus Bradycardia	Heart Rate less than 60
S Arrhy	Sinus Arrhythmia	Heart Rate varies with respiration
S Arrest	Sinus Arrest	A Pause

ATRIAL RHYTHMS {F WAVES}		
PAC	Premature Atrial Complex	Early complex with P Wave
AT	Atrial Tachycardia	Sudden Onset {PAT} Sustained rate usually >150
A Fib	Atrial Fibrillation	Irregular/Non-discernible P Waves/Chaotic Baseline
A Fl	Atrial Flutter	Sawtooth waveforms
WP	Wandering Pacemaker	Different Looking P's

JUNCTIONAL RHYTHMS {INVERTED OR NO P's}		
PJC	Premature Junctional Complex	Early complex with inverted P or flat baseline preceding QRS
JE	Junctional Escape	Rhythm with inverted P or flat baseline, HR = 40-60
AJ	Accelerated Junctional	Rhythm with inverted P or flat baseline, HR = 60-100
JT	Accelerated Tachycardia	Rhythm with inverted P or flat baseline, HR =>100

ECG INTERPRETATION (CONT.)

SUPRAVENTRICULAR TACHYCARDIA		
SVT	Supraventricular Tachycardia {ie; ST, AT, JT, A Fl}	Phrase used to describe a rapid, usually regular supraventricular arrhythmia when more accurate identification is impossible because P waves are not visible and the rate is common to other arrhythmias/

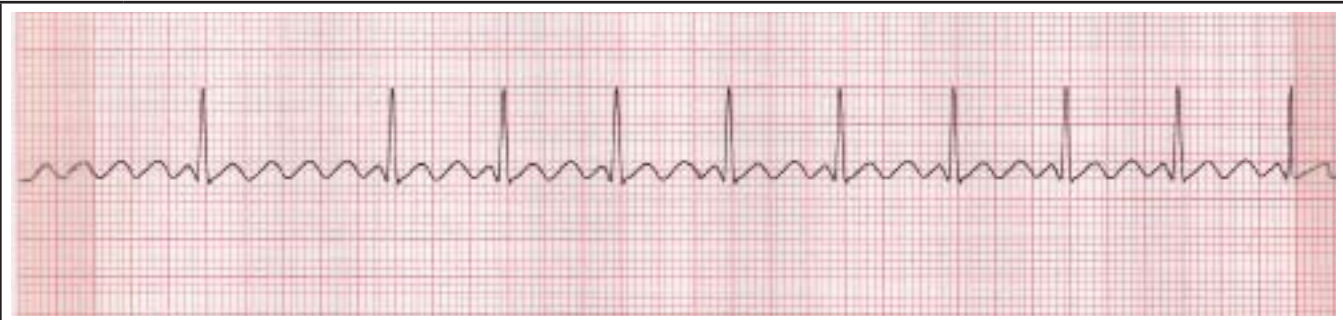
VENTRICULAR RHYTHMS {WIDE QRS>.12/ST-T WAVE POSSIBLY OPPOSITE OF QRS}		
PVC	Premature Ventricular Complex	Early beat/wide QRS/T wave possibly opposite of QRS
VE	Ventricular Escape	Ventricular Rhythm/HR usually<40
VT	Ventricular Tachycardia	Ventricular Rhythm or run/HR>100
VA	Ventricular Asystole	Total absence of ventricular electrical activity/P Waves may be present
PEA	Pulseless Electrical Activity	The presence of some type of electrical activity other than VT or VF, but a pulse cannot be detected
Pacer	Artificial Pacemaker	Pacemaker Spikes/Wide QRS

ATRIOVENTRICULAR BLOCKS {PR INTERVAL}		
1st	1st Degree	PRI>.20
2nd Type I	2nd Degree, Type I	PRI increases until dropped QRS, then PRI returns to original width
2nd Type II	2nd Degree, Type II	Multiple P waves, Constant PRI on conduct beats
3rd	3rd Degree	2 Rhythms {P-P regular/R-R regular} 2 Rates {P's = Atrial QRS = Ventricular} PRI varies

CARTER'S EQUATION

Rules of Interpretation + Identifying Rhythm Category + Arrhythmia Rule = Interpretation

ECG PRACTICE TEST



Strip 1	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 2	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 3	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



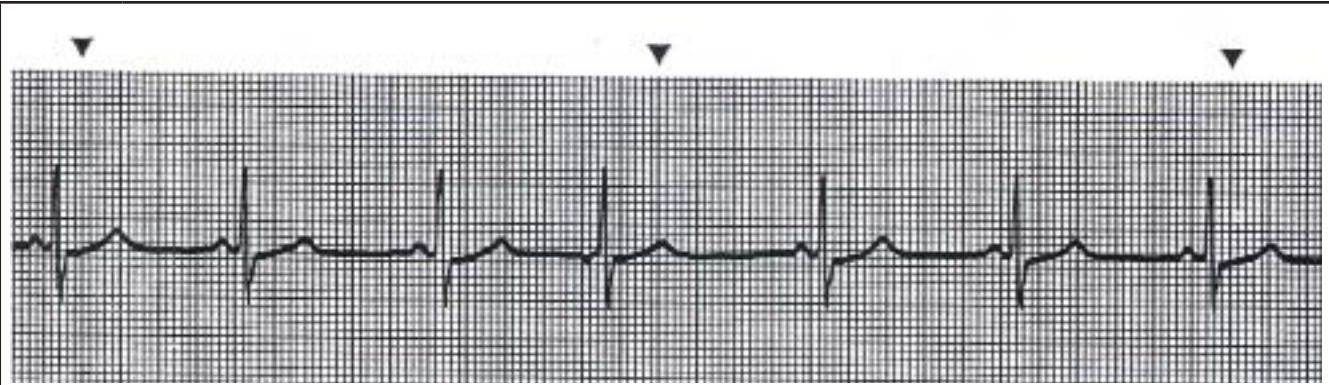
Strip 4	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



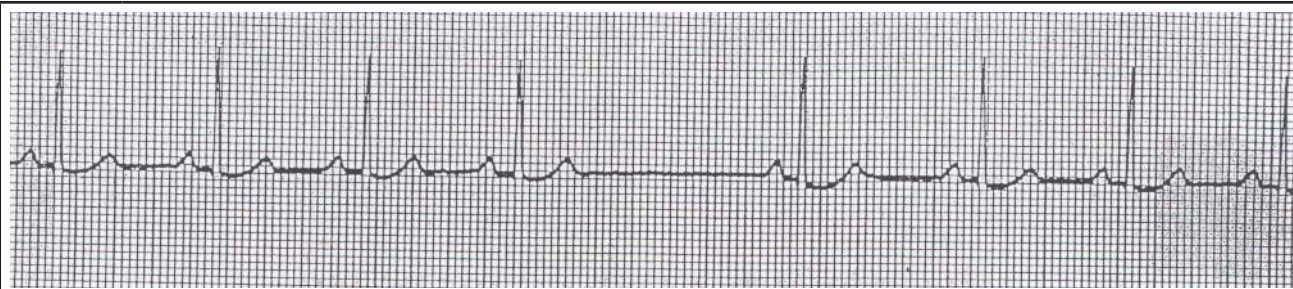
Strip 5	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 6	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 7	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 8	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



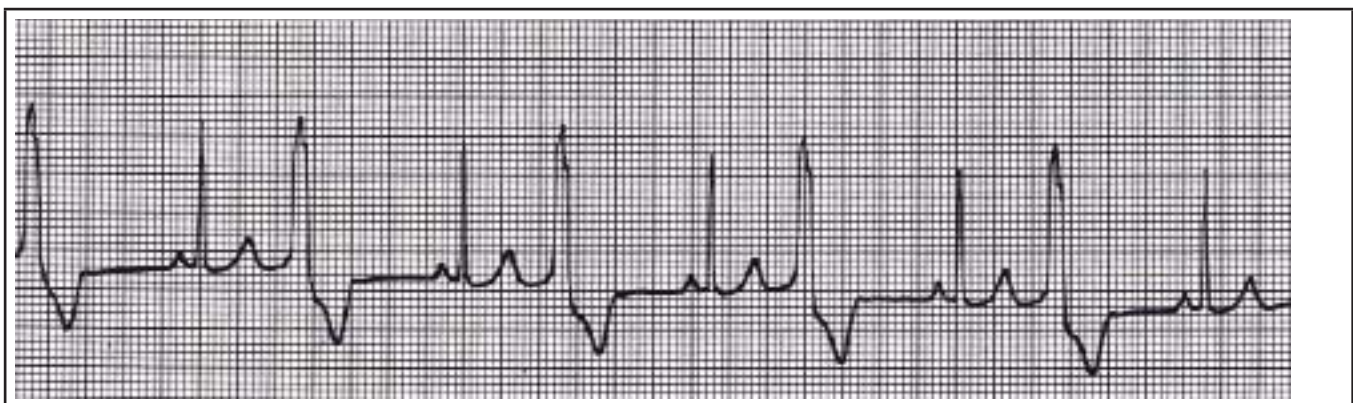
Strip 9	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



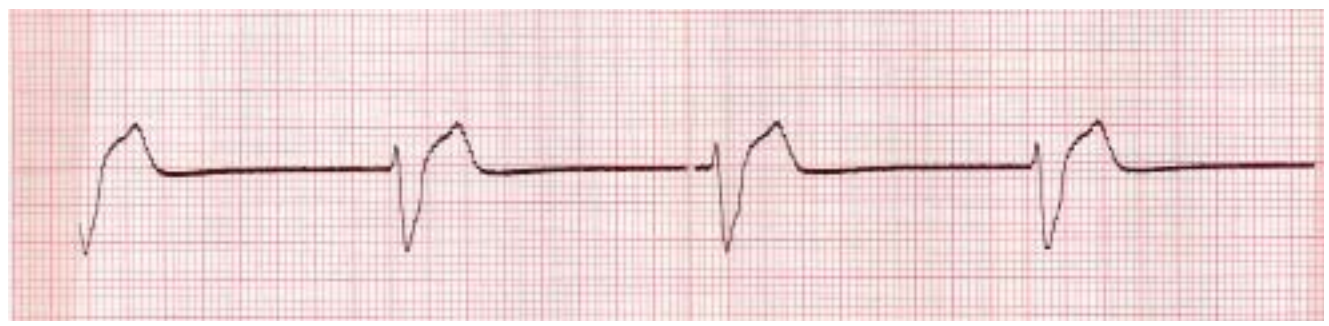
Strip 10	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 11	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 12	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 13	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 14	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



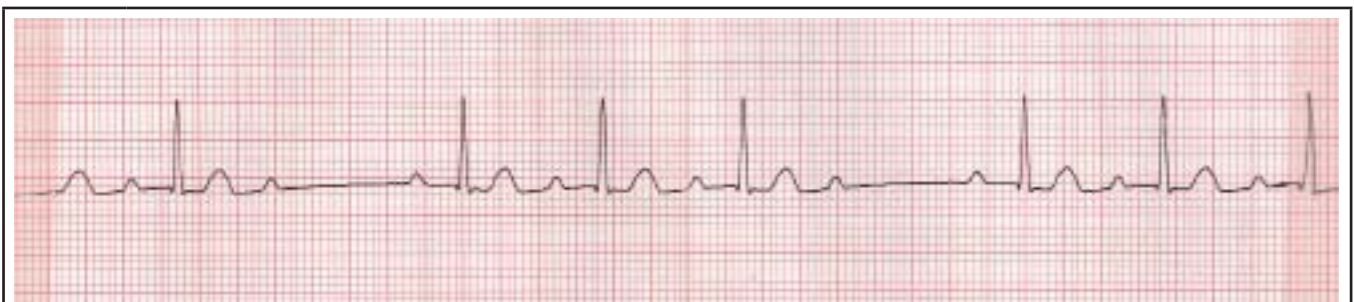
Strip 15	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 16	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



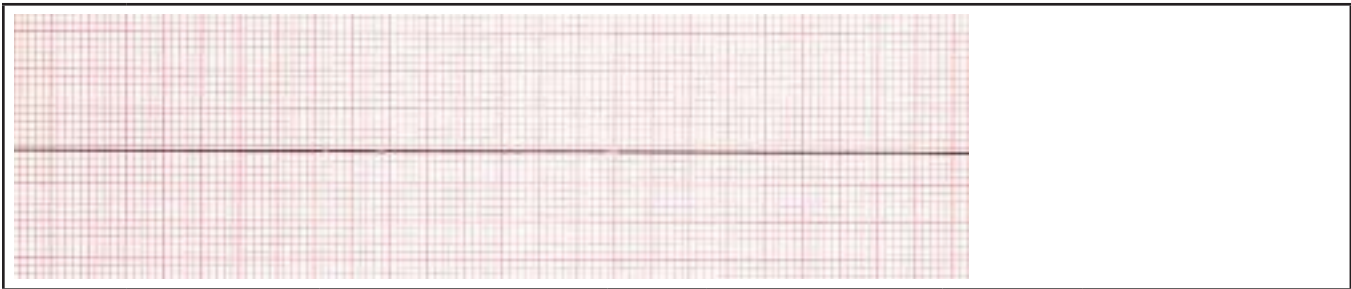
Strip 17	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 18	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 19	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



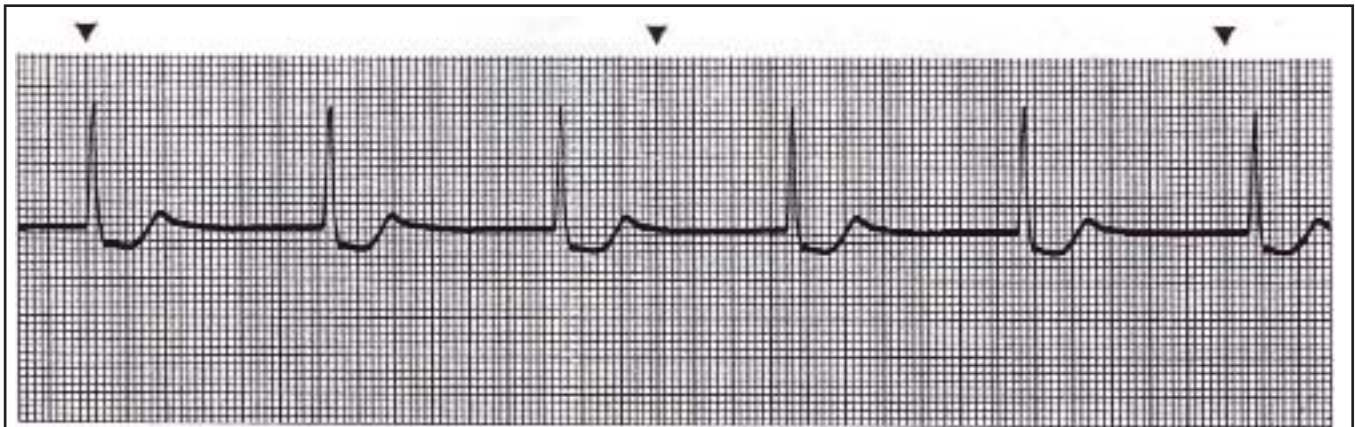
Strip 20	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



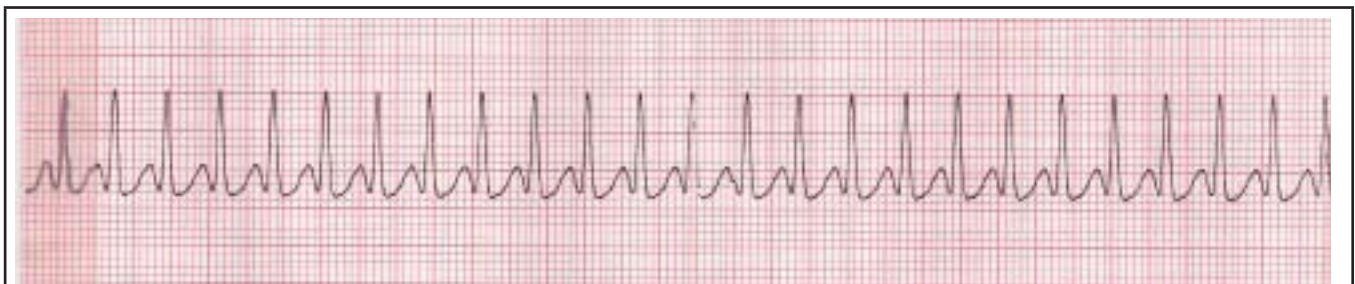
Strip 21	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



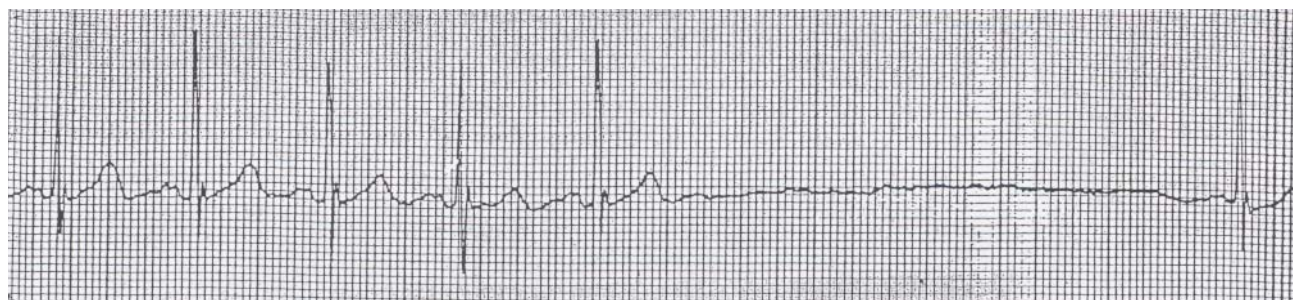
Strip 22	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



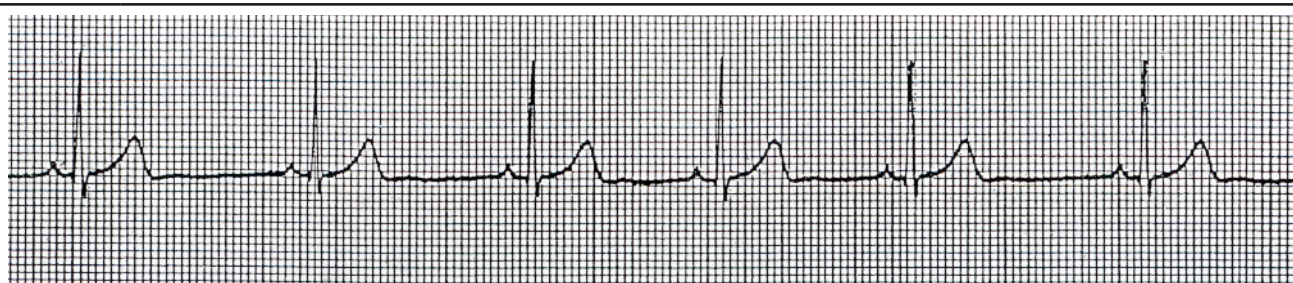
Strip 23	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



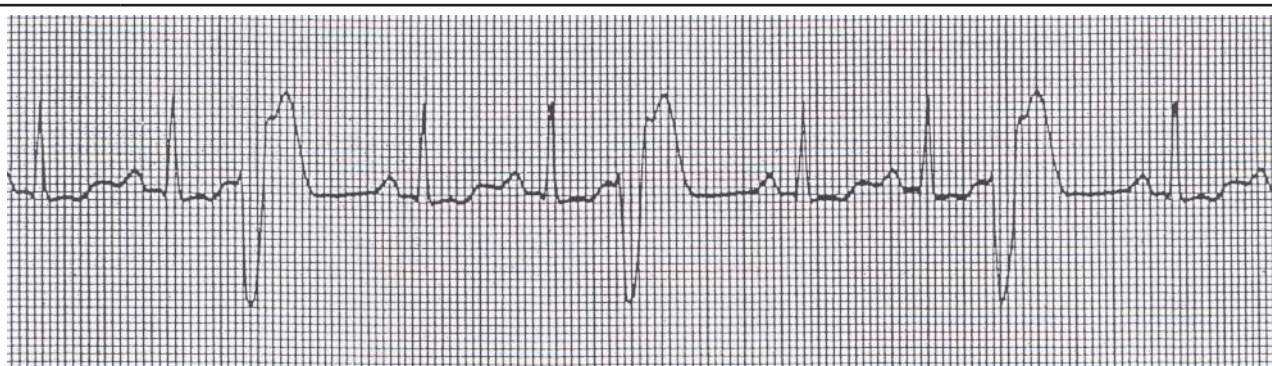
Strip 24	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 25	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



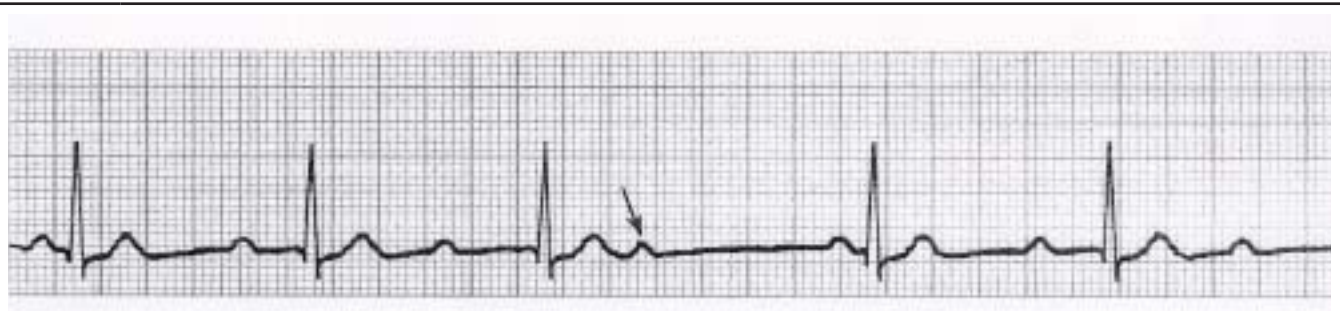
Strip 26	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



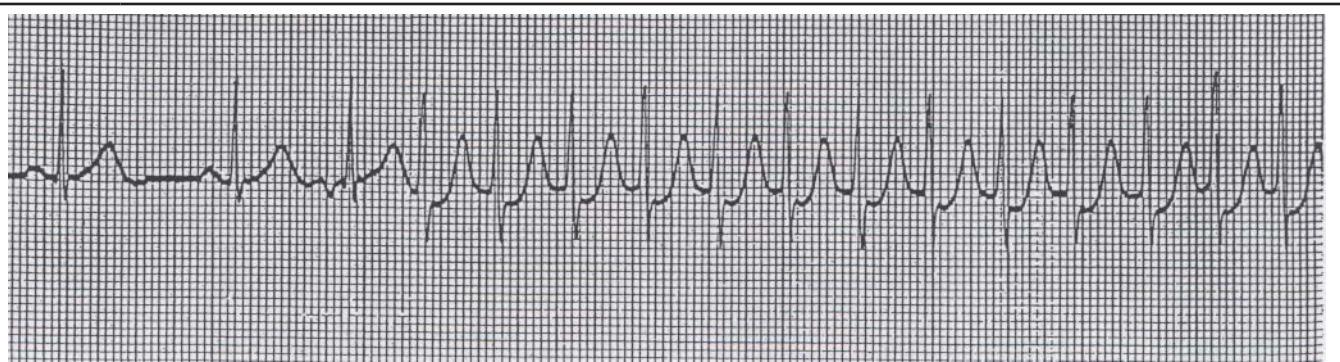
Strip 27	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 28	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 29	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					



Strip 30	Rhythm:		Rate:		P wave:	
	PR Interval:		QRS:			
	Rhythm Interpretation:					

ANSWER KEY TO EKG PRACTICE TEST

1. Atrial Flutter
2. Normal Sinus Rhythm
3. Torsades de Pointes (polymorphic)
4. First Degree AV Block
5. 3rd Degree AV Block (complete)
6. Ventricular Tachycardia
7. Premature Junctional Complex (PJC)
8. Sinus Pause
9. Ventricular Fibrillation
10. Sinus Rhythm with PACs (Premature Atrial Complex)
11. Couplet or Paired PVCs (Premature Ventricular Complex)
12. Bigeminal PVCs
13. Idioventricular Rhythm
14. Unifocal PVCs
15. Sinus Rhythm Bundle Branch Block
16. Sinus Tachycardia
17. Sinus Bradycardia
18. Second Degree AV Block Type II
19. Accelerated Junctional Rhythm
20. Asystole
21. Multifocal PVCs
22. Atrial Fibrillation
23. Junctional Rhythm
24. Supraventricular Tachycardia (SVT)
25. Sinus Arrest
26. Sinus Arrhythmia
27. Trigeminal PVCs
28. Ventricular Tachycardia (Monomorphic)
29. Second Degree AV Block Degree Type I
30. Sinus Rhythm with Paroxysmal Atrial Tachycardia (PAT)



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