



## ECG Interpretation: Rhythms and 12-Leads

### Presented by

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**Alumnus CCRN**

Pam, a nationally known expert in ECG interpretation, has over three decades of experience in critical care and cardiac nursing and teaching. With this extensive knowledge, she continues to provide comprehensive classes on all aspects of cardiac care. Her ability to teach healthcare providers how to accurately analyze and interpret all levels of ECG rhythms and 12-leads has earned her national status and invitations to speak at hospitals and medical centers throughout the United States. She has been a guest speaker for the American College of Cardiology, the Ninth Annual Charles A. Cannon Heart Center Symposium, the American Association of Nurse Anesthetists and a sponsored speaker at the 2008 ENA National Conference. Pam is owner and CEO of MED-ED, Inc., based in Charlotte, NC.

### 10.5 Contact Hours | Course Length: 603 minutes

### Program Description

Healthcare providers caring for patients who require cardiac monitoring must have an in-depth knowledge of electrocardiography in order to accurately and rapidly assess rhythm strips and 12-leads in order to recognize potentially life-threatening abnormalities. This course is split into two sections. First, the ECG Rhythms section covers the fundamental knowledge necessary to accurately identify disturbances in cardiac rhythms. Second, the 12-Leads section presents common abnormalities found on the 12-lead and challenges the learner with numerous examples to test his or her skills. This course is designed for the new nurse as well as the experienced nurse who desires to improve his or her interpretive skills.

### Program Learning Outcomes

*This program prepares the learner to:*

1. Identify the normal waveforms, rates and intervals of the electrocardiogram.
2. Describe accurate placement for monitoring leads and the standard 12-leads.
3. Identify clinical situations when alternative leads are indicated.
4. State a systematic approach to analyzing rhythms and 12-leads.
5. List ECG criteria for rhythms originating from the sinus node, atrium, AV junction and ventricles.
6. Examine the 12-lead and recognize waveform abnormalities.
7. Determine the electrical axis.
8. Correlate coronary artery blood flow with areas of infarction.
9. Differentiate the types of myocardial infarctions.
10. Recognize changes associated with intraventricular conduction defects.
11. Distinguish changes that mimic myocardial infarctions.
12. Discuss ECG changes associated with Wolff-Parkinson-White Syndrome.

# ECG Rhythms Topics Covered

## 1 Electrophysiology and Conduction Systems

39 minutes

### Module Description

This lecture is designed for the healthcare practitioner who is beginning to care for patients who require cardiac monitoring. The basics and foundations for ECG interpretation are provided to enable the learner to better understand the genesis of cardiac arrhythmias.

### Module Learning Outcomes

*This module prepares the learner to:*

1. Name the 4 properties of cardiac tissue.
2. List the ions involved in the cardiac action potential.
3. Identify the components of the conduction system.
4. Define terms depolarization, repolarization and terms associated with refractory periods.

## 2 Fundamentals of ECG Interpretation

55 minutes

### Module Description

This lecture will begin with a brief review of the conductive pathways and then correlate with the ECG waveforms and their normal appearance. A description of the electrocardiographic paper will be followed by the technique for measuring heart rates and intervals. The lecture will conclude with the principles of lead systems, proper placements of leads for bedside monitoring and a systematic approach to analyzing cardiac rhythms.

### Module Learning Outcomes

*This module prepares the learner to:*

1. List the components of the normal PQRST.
2. State the normal measurement values for ECG graph paper.
3. Correctly measure the PR, QRS and QT intervals.
4. Accurately calculate heart rate using 2 different measurement techniques.
5. List the steps for a systematic approach to analyzing ECG rhythms.

## 3 Sinus Node Disorders

20 minutes

### Module Description

This lecture reviews the anatomy and location of the sinus node and the arrhythmias that develop when dysfunction occurs. Viewers will have an opportunity to challenge their knowledge with test strips.

### Module Learning Outcomes

*This module prepares the learner to:*

1. Identify the location in the conduction system where sinus rhythms originate.
2. List the ECG criteria for sinus arrhythmia, sinus bradycardia and tachycardia.
3. List the ECG criteria that distinguishes between sinus arrest and sinus block.
4. List the various manifestations of sick sinus syndromes.

## 4 Atrial Arrhythmias

53 minutes

### Module Description

This lecture will discuss, in detail, the mechanisms responsible for specific atrial arrhythmias. Etiological factors and the ECG criteria of each type of atrial arrhythmias will be outlined with opportunities for the learner to test their interpretive skills.

### Module Learning Outcomes

*This module prepares the learner to:*

1. List the mechanism responsible for the different types of atrial arrhythmias.
2. Name the causes for the various types of atrial arrhythmias.
3. State the ECG criteria for atrial premature beats and atrial tachyarrhythmias.

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## 5 Junctional Rhythms

24 minutes

### Module Description

This lecture will provide the learner with ECG criteria necessary to accurately identify arrhythmias originating for the AV junction. Numerous rhythm strips are incorporated throughout the lecture allowing the learner to test their interpretive skills.

### Module Learning Outcomes

*This module prepares the learner to:*

1. List the causes of AV junctional irritability.
2. Identify ECG criteria associated with arrhythmias originating in the AV junction.

## 6 AV Nodal Blocks

31 minutes

### Module Description

This lecture begins with a review of the anatomical locations for AV nodal Blocks. ECG criteria is given for first, second and third degree heart block with an emphasis placed on the various categories of second degree. Sample tracings are provided to allow the learner to practice interpretive skills.

### Module Learning Outcomes

*This module prepares the learner to:*

1. Identify anatomical locations and etiologies for AV block.
2. List the ECG criteria for first, second and third degree AV block.

## 7 Ventricular Arrhythmias

40 minutes

### Module Description

This lecture will begin with a discussion of the causes of ventricular ectopy followed by the different manifestations and ECG criteria. The optimum lead selection for the rapid and accurate interpretation will also be included. The learner will have several tracings to test their interpretive skills.

### Module Learning Outcomes

*This module prepares the learner to:*

1. List the common causes of ventricular irritability.
2. Describe the ECG changes associated with the different types of ventricular arrhythmias.
3. Identify the best leads to use for optimum identification of ventricular ectopy.

# 12-Lead Topics Covered

## 1 The Normal 12-Lead and Determining Electrical Axis

95 minutes

### Module Description

This lecture will begin with a description of unipolar and bipolar leads and the principles of lead systems. The proper placement of limb leads and precordial leads is also discussed. The normal waveform configuration for each lead will be outlined in detail. The learner will also be provided with a systematic approach to analyzing the 12-lead. This module will also include a step by step process of how to determine electrical axis beginning with the causes of axis deviations.

### Module Learning Outcomes

*This module prepares the learner to:*

1. Define bipolar and unipolar leads
2. Describe the proper placement of the limb leads and precordial leads.
3. Identify as normal the PQRST waveforms on each of the standard 12-leads.
4. List steps to systematically analyze the 12-Lead ECG.
5. List common causes of axis deviations.
6. Outline the steps to determine electrical axis.

## 2 Acute Coronary Syndromes

59 minutes

### Module Description

This module will explain the distinguishing characteristics of STEMI, NSTEMI, and UA along with the ECG changes associated with each condition. There will also be an explanation of the anatomical location of the coronary arteries and the leads affected with arterial occlusions.

### Module Learning Outcomes

*This module prepares the learner to:*

1. List the distinguishing features between STEMI, NSTEMI, and UA.
2. Identify patterns of ischemia, injury and infarction.
3. Distinguish indicative changes from reciprocal changes.
4. Identify areas of infarction on the standard 12-Lead ECG.

## 3 Bundle Branch Blocks

47 minutes

### Module Description

This lecture will review the anatomical features of the bundle branches and outline the ECG criteria for left versus right bundle branch and hemiblocks. The optimum leads for interpretation will also be discussed. The learner will have an opportunity to test their interpretive skills with sample ECG tracings.

### Module Objectives

*This module prepares the learner to:*

1. List the leads that are optimum for identify intraventricular conduction defects.
2. State the ECG criteria for left and right bundle branch block.
3. State the ECG criteria for left anterior and left posterior hemiblock.

## 4 Distinguishing Wide QRS Tachycardias

55 minutes

### Module Description

This lecture will discuss the optimum leads to best identify morphological changes associated with ventricular and aberrantly conducted beats. Numerous clues on the 12-lead will be provided that will enable the learner to rapidly and accurately distinguish ventricular tachycardia from supraventricular tachycardia with aberrancy.

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### **Module Learning Outcomes**

*This module prepares the learner to:*

1. Name the ECG leads that best provide QRS morphological information.
2. Define aberration and associated ECG changes.
3. Distinguish ventricular tachycardia from supraventricular tachycardia.

## **5 Wolff-Parkinson-White Syndrome**

**48 minutes**

### **Module Description**

This lecture describes the abnormal conduction pathways and ECG changes associated with W-P-W along with the types of tachyarrhythmias that may occur as a result of an accessory pathway.

### **Module Learning Outcomes**

*This module prepares the learner to:*

1. Describe the anatomical abnormality associated with W-P-W.
2. List the ECG changes associated with W-P-W.
3. Distinguish orthodromic from antidromic tachycardia.

## **6 Myocardial Infarction Mimicry**

**37 minutes**

### **Module Description**

This lecture begins with a review of the anatomical locations for AV nodal blocks. ECG criteria is given for first, second and third degree heart block with an emphasis placed on the various categories of second degree. Sample tracings are provided to allow the learner to practice interpretive skills.

### **Module Learning Outcomes**

*This module prepares the learner to:*

1. Identify ECG changes associated with pulmonary embolus.
2. Identify ECG changes associated with early repolarization.
3. Identify ECG changes associated with pericarditis.
4. Identify ECG changes associated with hyperkalemia.
5. List the distinguishing features of pulmonary embolus, early repolarization, pericarditis, hyperkalemia from those of myocardial infarction.
6. Identify the elements of crisis and the effects it has on the individual and the family.

# Accreditation

## RN/LPN/LVN/Other: 10.5 Contact Hours

MED-ED, Inc. is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation (**ANCC**).

MED-ED, Inc. is an approved provider by the following State Boards of Nursing: **Florida**/FBN 50-1286, **Iowa**/296, **California** #CEP10453.

If your profession is not listed, we suggest contacting your board to determine your continuing education requirements and ask about reciprocal approval. Many boards will approve this seminar based on the accreditation of the boards listed here.

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