



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 Contact Hours | Course Length: 573 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. Describe the mechanisms responsible for the different types of arrhythmias that may develop in the hospitalized patient.
2. Discuss the pathophysiology associated with the presented abnormal 12-leads.
3. Apply a systematic approach to analyzing cardiac arrhythmias and the 12-Lead ECG.
4. List the ECG criteria for each of the presented cardiac arrhythmias and abnormal 12-leads.
5. Accurately interpret the selection of cardiac arrhythmias and 12-Lead ECGs.

ECG Rhythms Topics Covered

1 Electrophysiology and Conduction Systems

39 minutes

Module Description

This module is designed to explain the foundations for ECG interpretation and to enable the learner to better understand the genesis of cardiac arrhythmias. Each phase of the action potential will be discussed along with relationships to the components of ECG waveforms.

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. Outline the ionic activity during the 4 stages of the action potential.
4. Define depolarization, repolarization and terms associated with refractory periods.
5. Identify the components of the conduction system.

2 Electrocardiographic Components

31 minutes

Module Description

This module will discuss the waveforms comprising the electrocardiogram. Each component will be addressed separately and in detail outlining the normal configurations as seen in standard monitoring leads.

Module Learning Outcomes

This module prepares the learner to:

1. List the components of the normal electrocardiogram.
2. State the normal measurement values for ECG graph paper.
3. Discuss the normal configurations for the P wave, QRS complex, ST segment, T and U waves as seen in Leads 2 and V1.

3 Intervals, Rates and a Systematic Approach to Analysis

45 minutes

Module Description

This module will discuss the proper method of determining intervals and heart rates as well as how to apply a systematic approach to analyzing rhythm strips.

Module Learning Outcomes

This module prepares the learner to:

1. Identify normal intervals for the PR segment, QRS interval and QT interval.
2. List three different methods to determine heart rate.
3. Outline a systematic approach to interpreting rhythm strips.

4 Sinus Mechanisms

42 minutes

Module Description

This module will discuss rhythms that originate in the sinus node. The mechanisms of normal sinus rhythms and sinus arrhythmias are also discussed along with the ECG criteria for each.

Module Learning Outcomes

This module prepares the learner to:

1. Identify a normal sinus rhythm.
2. List the ECG criteria for sinus arrhythmia, sinus bradycardia and tachycardia.
3. Distinguish between sinus arrest and sinus block.
4. Outline the various manifestations of sick sinus syndrome.

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5 Atrial Rhythms

45 minutes

Module Description

This lecture will discuss, in detail, the mechanisms responsible for specific atrial rhythms. Etiological factors and the ECG criteria of each type of atrial arrhythmia will be outlined with opportunities for the learner to test his or her 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 of the various types of atrial arrhythmias.
3. List the ECG criteria for arrhythmias originating in the atria.

6 Junctional Rhythms

27 minutes

Module Description

This module will provide the learner with the ECG criteria necessary to accurately identify arrhythmias originating from the AV junction. Numerous rhythm strips are incorporated throughout the module to allow the learner to test his or her interpretive skills.

Module Learning Outcomes

This module prepares the learner to:

1. Discuss the mechanism of rhythms originating in the AV junction.
2. Identify the ECG criteria associated with junctional rhythms.

7 AV Nodal Blocks

29 minutes

Module Description

This module begins with a review of the anatomical locations for AV nodal blocks. The ECG criteria is outlined for first-, second- and third-degree heart block with an emphasis placed on the 2 types of second-degree block. 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.
3. Distinguish between second-degree type 1 and second-degree type 2 AV block.

8 Ventricular Rhythms

33 minutes

Module Description

This module will begin with a discussion of the causes of ventricular ectopy followed by the different manifestations and ECG criteria for each. The optimum lead selection for rapid and accurate interpretation will also be included. The learner will have an opportunity to test his or her interpretive skills at the end of the module.

Module Learning Outcomes

This module prepares the learner to:

1. Discuss the mechanism of rhythms originating in the ventricles.
2. Identify the best leads to use for optimum identification of ventricular ectopy.
3. List the ECG criteria for premature ventricular beats, ventricular tachycardia, ventricular fibrillation and torsades de pointes.
4. Describe the characteristics of Brugada syndrome.

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12-Lead Topics Covered

1 Fundamentals of the 12-Lead ECG

42 minutes

Module Description

This module discusses the principles of the lead systems followed by a detailed explanation of each of the standard 12-leads and proper placement for optimum recordings. The normal waveforms and morphology of each lead are also discussed. A systematic approach to analyzing a 12-lead is provided along with practice strips.

Module Learning Outcomes

This module prepares the learner to:

1. Outline the 3 principles of lead systems.
2. List each of the 12-leads and proper placement.
3. Identify the normal morphologies for each lead.
4. Describe a systematic approach to analyzing the 12-lead.

2 Determining Electrical Axis

40 minutes

Module Description

This module will provide the learner with concepts of electrical axis along with the steps to determine the quadrants and degrees of the axis. Practice 12-leads will be provided at the end of the module.

Module Learning Outcomes

This module prepares the learner to:

1. List the factors that alter electrical axis.
2. List the steps to determine axis quadrants.
3. List the steps to determine the degrees of axis.

3 Acute Coronary Syndromes

57 minutes

Module Description

This module will begin with an explanation of ST-segment myocardial infarction (STEMI), non-ST-segment elevation myocardial infarction (NSTEMI) and unstable angina. The current guidelines for STEMI will be discussed followed by the detailed ECG morphologies and the outlining of lead groups for localizing the infarction.

Module Objectives

This module prepares the learner to:

1. Distinguish between STEMI, NSTEMI and unstable angina.
2. List the current guidelines for the identification of STEMI.
3. Identify lead groups to localize a myocardial infarction.

4 Bundle Branch Blocks and Hemiblocks

33 minutes

Module Description

This module will review the anatomical features of bundle branches and outline the ECG criteria for left versus right bundle branch block. The mechanisms and ECG criteria for left anterior and left posterior fascicular blocks will also be discussed. The learner will have the opportunity to test his or her interpretive skills with sample ECG tracings.

Module Learning Outcomes

This module prepares the learner to:

1. List the leads that are optimum for identifying 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 fascicular blocks.

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5 Distinguishing Wide QRS Tachycardias

39 minutes

Module Description

This module will begin with the different mechanisms that can produce a wide-complex tachycardia. Numerous clues and criteria will be provided to assist the learner in distinguishing between a ventricular tachycardia and a supraventricular tachycardia with a bundle-branch pattern. Practice 12-leads are included.

Module Learning Outcomes

This module prepares the learner to:

1. Describe the mechanisms that produce a wide-complex tachycardia.
2. List clues found on the 12-Lead ECG that assist in distinguishing a ventricular tachycardia from a supraventricular tachycardia with a bundle-branch pattern.

6 Wolff-Parkinson-White Syndrome

33 minutes

Module Description

This module begins with an explanation of preexcitation syndromes and their influences on the 12-Lead ECG. The focus of this module will be on the type of preexcitation syndrome that produces the ECG changes associated with Wolff-Parkinson-White (W-P-W) syndrome. The tachycardias associated with W-P-W and their management are also included in this discussion.

Module Learning Outcomes

This module prepares the learner to:

1. Define preexcitation syndrome and its etiologies.
2. List the ECG criteria for W-P-W.
3. List the types of tachycardias associated with W-P-W and management strategies for each.

7 Myocardial Infarction Mimicry

38 minutes

Module Description

Many abnormalities found on the 12-lead electrocardiogram have changes that can mimic a myocardial infarction. This lecture will present selected abnormalities and identify the features that distinguish their changes from those of myocardial infarctions.

Module Learning Outcomes

This module prepares the learner to:

1. Distinguish primary ST-segment changes from secondary ST-segment changes.
2. List 3 abnormal 12-Lead ECGs that may mimic a myocardial infarction.
3. Outline the distinguishing features of those abnormal ECGs and those of a myocardial infarction.

Accreditation

RN/LPN/LVN/Other: 10 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**).

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