AMERICAN MEDICAL SEMINARS®

SPECIFIC OBJECTIVES

Enhancing Clinical Excellence

CME Sponsors: American Medical Seminars, Inc.
Activity Title: ECG in Primary Care: Beyond the Basics – Improving Your 12-Lead ECG Interpretation Skills
Activity Dates: March 30 - April 3, 2020
Presenting Faculty: Jerry W. Jones, MD FACEP FAAEM

NARRATIVE DESCRIPTION

Many, if not most, medical schools and residency programs are deficient in the amount of ECG interpretation instruction they provide. Most med school graduates are unprepared for handling cardiac cases or emergencies that require interpreting a 12-lead ECG. Too many rely on the ECG machine interpretation. Residency programs typically do not offer basic instruction in electrocardiography other than occasional presentations of complex ECGs that does little to further the practical skillsets of the residents. This is can be very dangerous.

This class is designed to take the person with no more than basic knowledge of ECGs and to expand that knowledge and skill through presentations not usually found in most lecture series. Not only are ECG patterns presented, but the cause of those patterns is also discussed in order to give each finding a link to the physical anatomy and physiology of the heart. Each participant should feel more confident in recognizing abnormalities – whether they understand what is happening or not. Too often serious abnormalities are simply not recognized and the patient has an unfortunate outcome. Just the ability to recognize an abnormality – with or without being able to diagnose it – can save a life.

SPECIFIC TOPIC OBJECTIVES

Day 1

Normal/Abnormal P waves, PR intervals and QRS complexes.

Upon completion of this session, the participant should be able to: COMP

1. Distinguish P waves originating outside the SA node.
2. Differentiate PR intervals that indicate AV conduction from those that do not.
3. Appraise the appropriateness of the QRS intervals in relation to the leads in which they appear
4. Distinguish normal septal q waves from pathological Q waves.

Normal/Abnormal ST Segments and T Waves.

Upon completion of this session, the participant should be able to: COMP

1. Distinguish between normal ST segments and ST segments that deviate abnormally from the baseline.
2. Relate the different appearances of an abnormal ST segment.
3. Detect abnormalities in the T wave.
4. Appraise the QTc interval for abnormal durations.

Axes and Vectors and the Hexaxial Grid: How do they help?

Upon completion of this session, the participant should be able to: COMP

1. Determine the Mean QRS Axis (ÂQRS) in the frontal plane.
2. Relate why a particular deflection may be positive in one lead but negative in another.
3. Utilize vectors to determine the approximate site of origination and termination of a depolarizing impulse.
4. Employ the hexaxial grid to determine the effect of vectors on particular areas of the heart.

Leads and Electrodes: What Do They See? How Do I Group Them? Are They Applied Correctly?

Upon completion of this session, the participant should be able to: COMP

1. Analyze the 12-lead ECG in terms of inferior, anterior, posterolateral, anteroseptal and anterolateral patterns.
2. Use the knowledge of Einthoven's Triangle to determine the source of an electrode connectivity artifact.
3. Apply knowledge of correct deflection morphologies in detecting the presence of lead wire interchanges.

Day 2

Bundle Branch Block.

Upon completion of this session, the participant should be able to: COMP

1. Distinguish the classic morphologies of complete right bundle branch block (cRBBB) and complete left bundle branch block (cLBBB).
2. Differentiate the repolarization abnormality from acute ischemia.
3. Distinguish between true complete bundle branch block and ventricular ectopy.
4. Distinguish nonspecific interventricular conduction defects from classic bundle branch block.

1st Degree and 2nd Degree AV Blocks.

Upon completion of this session, the participant should be able to: COMP

1. Interpret a 1st Degree AV block in relation to the patient's age and physical condition.
2. Detect a Mobitz Type I 2nd degree AV block and relate it to a cause, a prognosis and a treatment.
3. Detect a Mobitz II 2nd degree AV block and relate it to a cause, a prognosis and a treatment.
4. Differentiate Mobitz Type I and Mobitz Type II AV blocks with regards to the site of block.

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3rd Degree AV Block and AV Dissociation.
Upon completion of this session, the participant should be able to: COMP

1. Distinguish a 3rd degree AV block from a simple AV dissociation.
2. Discuss capture beats and fusion beats and demonstrate their utility in the diagnosis of AV dissociation and its differentiation from 3rd degree AV block.
3. Relate the differences between a junctional escape pacemaker and a ventricular escape pacemaker.
4. Illustrate the differences between a 3rd degree AV block in the AV node and one in the infranodal regions.

Chamber Enlargement.
Upon completion of this session, the participant should be able to: COMP

1. Relate at least two different methods of determining left ventricular hypertrophy.
2. Detect the electrocardiographic signs of right ventricular hypertrophy.
3. Distinguish right atrial abnormality from left atrial abnormality.
4. Relate the presence or absence of a repolarization abnormality in RVH and LVH to patient prognosis.

Day 3
Atrial Tachycardia, Atrial Fibrillation and Atrial Flutter.
Upon completion of this session, the participant should be able to: COMP

1. Distinguish atrial tachycardia from sinus tachycardia.
2. Distinguish atrial flutter from both atrial tachycardia and sinus tachycardia.
3. Distinguish sinus tachycardia from atrial flutter with 2:1 conduction
4. Detect 3rd degree AV block in the presence of atrial fibrillation

AVNRT: Atrioventricular Nodal Reentrant Tachycardia.
Upon completion of this session, the participant should be able to: COMP

1. Relate the typical P wave changes in AVNRT relative to the QRS complex
2. Relate the mechanism of AVNRT and how that knowledge is used to terminate the dysrhythmia
3. Distinguish AVNRT from a rapid atrial flutter with 2:1 conduction

Pre-excitation and AVRT (Atrioventricular Reentrant Tachycardia)
Upon completion of this session, the participant should be able to: COMP

1. Detect positive and negative delta waves
2. Differentiate between a “by-stander” accessory pathway and a “circus movement” dysrhythmia
3. Differentiate between an AVNRT and an AVRT
4. Relate the inherent dangers of an accessory pathway

Wide Complex Tachycardias (WCT) | Ventricular Tachycardia.
Upon completion of this session, the participant should be able to: COMP

1. Distinguish between classic bundle branch block morphology and ectopy
2. Utilize three “quick signs” that are highly suggestive of ventricular tachycardia as the cause of a WCT
3. Relate and utilize the Brugada Algorithm in diagnosing ventricular tachycardia
4. Assess a WCT for its differential diagnosis of four possibilities: ventricular tachycardia, SVT with aberrancy, antidromic AVRT and “toxic tachycardia” associated with hyperkalemia or Na+ channel blocker toxicity.

Day 4
Ischemia: Subendocardial, Epicardial, Hyperacute T’s, Jones’s Sign (Jones’s Rule)
Upon completion of this session, the participant should be able to: COMP

1. Differentiate between subendocardial ischemia and epicardial ischemia.
2. Analyze a 12-lead ECG for the earliest signs of myocardial ischemia.
3. Detect “Jones’s Sign” and assess minimal ST changes as possible early signs of ischemia.
4. Distinguish between inferior, anteroseptal (anteroapical), anterolateral and posterolateral epicardial ischemias.

Reciprocal changes: What are they and how do they help? | Timeline for ST – T Resolution Post-MI.
Upon completion of this session, the participant should be able to: COMP

1. Differentiate between ST depression as an indication of subendocardial ischemia or as a reciprocal change

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2. Utilize serial 12-lead ECGs to detect subtle changes in the ST segment when the initial ECG is non-diagnostic
3. Detect dysrhythmias characteristic and diagnostic of reperfusion
4. Relate current ST deviation in relation to the elapsed time following reperfusion

Inferior MIs and Posterolateral MIs.
Upon completion of this session, the participant should be able to: COMP
1. Detect ST elevations indicating acute inferior epicardial ischemia
2. List two other areas of the heart commonly affected when inferior epicardial ischemia is evident
3. Distinguish between anterior subendocardial ischemia and posterolateral epicardial ischemia
4. Recommend a preferred approach to a patient with chest pain and a non-diagnostic admission 12-lead ECG

Anterior MIs.
Upon completion of this session, the participant should be able to: COMP
1. Distinguish between anteroseptal and anterolateral acute epicardial ischemia
2. Utilize reciprocal changes in the limb leads to validate acute anterior epicardial ischemia
3. Specify inherent difficulties in evaluating ST elevation in Leads V1 and V2
4. Distinguish between basolateral and apicolateral involvement

Day 5
Methodical Approach to ECG Interpretation.
Upon completion of this session, the participant should be able to: COMP
1. Recognize the importance of a fixed, methodical approach to 12-lead ECG interpretation.
2. Demonstrate the recommended order of 12-lead ECG analysis.
3. Utilize the "Three Main Causes" approach to abnormalities encountered while interpreting a 12-lead ECG.
4. Integrate participant's own adjustments to the methodical approach without reducing sensitivity

5 Things You MUST Look For Before Putting Down an ECG | 5 Fatal Mistakes To AVOID While Interpreting an ECG.
Upon completion of this session, the participant should be able to: COMP
1. List 5 conditions for which the ECG must be specifically and carefully scrutinized
2. Specify 5 analytical or interpretative mistakes that could result in increased patient morbidity or fatality
3. Integrate steps to avoid missing important signs on the 12-lead ECG into the methodical approach.

Two Signs of Potentially Lethal Dysrhythmias and Two Signs of Potentially Lethal Heart Disease.
Upon completion of this session, the participant should be able to: GL, COMP
1. Detect the ECG changes of Brugada Syndrome
2. Detect changes suggestive of hyperkalemia
3. Detect the changes of Wellens Syndrome
4. Detect de Winter T wave changes and relate their importance

ECG Interpretation Practice.
Upon completion of this session, the participant should be able to: GL, COMP
1. Demonstrate the ability to utilize the Methodical Approach to 12-lead ECG interpretation while incorporating the "Three Main Causes" approach to assessing any abnormalities encountered during the interpretation
2. Demonstrate the ability to recognize the different forms of AV block and to differentiate 3rd degree AV block from simple AV dissociation
3. Specify the classic morphological features of left and right bundle branch block and the importance of the repolarization abnormality
4. Recognize the main categories of subendocardial and acute epicardial ischemia
5. Relate the importance and use of reciprocal changes in diagnosing acute epicardial ischemia