

Essentials of Electrocardiography

Course Syllabus

Course Description

Essentials of Electrocardiography (ECG) is intended to fill in the gaps of knowledge of anatomy of the heart, electrophysiology, and basic ECG administration and interpretation. After completing this course, students will be able to complete ECGs in the field, describe introductory cardiovascular anatomy, relationships of other body systems to heart health, legal and ethical considerations, patient assessment techniques, instructions on how to complete and document ECGs, and basic interpretation of ECG tracings.

Learning Outcomes

Upon successful completion of this course, students will be able to:

- Describe the anatomy and electrophysiology of the heart.
- Set up and administer ECGs, stress tests, and monitors.
- Recognize and correct artifacts.
- List the characteristics of basic arrhythmias.
- Identify ECG medical emergencies.
- Maintain ECG equipment and demonstrate lead placement.
- Complete and document patient assessments.

Course Outline and Objectives

Chapter 1: Anatomy of the Heart

1. Explain the heart's directional positions.
2. Recognize the heart's anatomy.
3. Contrast three types of cardiac cells.
4. Identify four differences between arteries and veins.
5. Diagram the path of oxygenated and deoxygenated blood flow.

Chapter 2: Body Systems and Heart Health

1. Identify the role that respiratory conditions may play in altering heart health.
2. Contrast the heart's response to stimuli between the sympathetic and parasympathetic nervous system.
3. Compare three types of cerebral vascular accidents.
4. List three functions of the integumentary system necessary for healthy heart maintenance.
5. Explain how homeostasis imbalance plays a role in body fluid retention.
6. Recognize the connection between heart health, the kidneys, and blood pressure.
7. Discuss how electrolytes produce electricity to make the heart beat.
8. Identify the endocrine glands that directly affect heart health.
9. Describe metabolic syndrome.

Chapter 3: Heart Electrical Physiology

1. Identify the characteristics of specialized myocardial cell functions.
2. Outline polarity-electrolyte movement.

3. Compare the five stages of action potential to electrolyte polarity.
4. Define the terms diastole and systole.
5. Draw the cardiac cycle, output, and electrical conduction.
6. Map the heart's primary pacemakers and list the intrinsic firing ranges.
7. Describe three conduction abnormalities.

Chapter 4: Cardiovascular Medications

1. Explain the difference between primary and secondary prevention drugs.
2. List five categories of cardiac medications.
3. Explain the function of the angiotensin hormone.
4. List three major classifications of arrhythmia.
5. Describe the long-term goals for beta blocker drugs.
6. Identify the purpose of antihyperlipidemic drug therapy.
7. Explain the difference between antiplatelet and anticoagulant agents.
8. List three types of potential drug interactions with prescribed medications.
9. Identify three ways that patients can take ownership of their heart health.

Chapter 5: Patient Assessment

1. List six primary vital sign measurements.
2. Explain the purpose of a pulse oximeter.
3. Describe heart rate variability.
4. Describe the purpose of measuring jugular venous pressure (JVP).
5. Calculate an ankle brachial index (ABI) systemic blood pressure.
6. Contrast the major classifications of diabetes.
7. List routine cardiac blood tests.
8. Define OPQRST and OPQRST assessments.

Chapter 6: Electrocardiogram Basics

1. Summarize the primary differences between a single-channel and multichannel ECG machine.
2. Differentiate between an ECG electrode and an ECG lead.
3. Interpret the theory of Einthoven's Triangle.
4. Summarize which leads look at each of the four heart walls.
5. List the anatomically contiguous and reciprocal leads.
6. Identify the placement of standard limb leads and precordial leads on a patient.
7. Describe lead placements for posterior and right sided ECGs.
8. Contrast placements of leads for 3-lead and 5-lead ECGs.
9. Define informed and implied consent.
10. Demonstrate performing and documenting a 12-lead ECG on a patient.

Chapter 7: Waveforms, Rate, Rhythm, and Artifacts

1. Measure duration and voltage on an ECG strip.
2. Describe the isoelectric line, and positive and negative wave reflections.
3. Explain Einthoven's waveforms.
4. Contrast the following terms: interval, segment, complex, and wave.
5. Calculate heart rate.
6. Analyze electrocardiogram rhythms.
7. Identify common artifacts.
8. Explain how to identify limb and precordial lead reversals.
9. Explain normal R wave progression.

Chapter 8: Recognizing Arrhythmias, Pacemakers, and Emergencies

1. Identify four major classifications of arrhythmias.
2. List four atrial arrhythmias.
3. Contrast a premature junctional complex to an accelerated junctional rhythm.
4. Identify the primary difference in the QRS complex between ventricular tachycardia and ventricular fibrillation.
5. Explain similarities between pulseless electrical activity and asystole.
6. Locate atrial and ventricular pacemaker spikes on an ECG tracing.
7. Describe three primary components of a synchronous pacemaker and an implantable cardioverter defibrillator.
8. Explain three pacemaker malfunctions.
9. Define the three stages of an acute myocardial infarction (AMI).
10. List emergency cardiac medications.

Completion and Accreditation

Students who pass the chapter tests with an overall average of 70% or higher will receive a certificate of completion and 5.3 Continuing Education Units (CEUs). One CEU is equivalent to 10 hours of class time.

Corexcel is accredited by the International Association for Continuing Education and Training (IACET) and is authorized to issue the IACET CEU. In obtaining this accreditation, Corexcel has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider membership status, Corexcel is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.