

A large, faint, stylized star graphic is positioned in the bottom right corner of the page. It is composed of several overlapping, semi-transparent shapes in shades of light red and light grey, creating a complex, multi-pointed star effect.

impULSE3.0[®]

Chest Pain Competency Series

Course Description and Outline

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Level I - Cardiac A&P

Course Description

Level I of impULSE 3.0 brings cardiac anatomy and physiology to life by providing you with a clear, concentrated review of heart function. This educational experience presents anatomical structures and functions of the heart with interactive 3D graphics and easy to understand, supporting information. Learn cardiac physiology, including the cardiac cycle, circulation, conduction, and intrinsic pacemakers with the ability to see it in action. Build and examine the normal cardiac waveform while understanding it in relation to cardiac physiology. Engaging visuals, dynamic quizzing, and interactivity used throughout the program will help you to learn more effectively and retain new information quickly!

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Recognize anatomical structures of the heart.
2. Explain the physiology of the heart including its structures, tissues, and cell functions.
3. Describe the cardiac cycle, heart regions, and cardiopulmonary circulation.
4. Identify the intrinsic pacemakers of the heart and its influence on heart rate.
5. Relate the physiology of cardiac conduction to the components of the normal ECG waveform.

The screenshot shows the impULSE 3.0 interface. On the left is a navigation menu with 'LEVEL I Cardiac A & P' selected. The main content area is titled 'Myocardial Layers' and features a 3D anatomical diagram of the heart wall. Text on the screen states: 'Heart muscle is comprised of three layers:'. It lists three layers: 1. The pericardium (double-walled sac), 2. The myocardium (middle muscular layer), and 3. The endocardium (inner lining). A blue callout line points from the text 'Myocardium' to the corresponding layer in the diagram. A 'Starling's Law' button and a 'Show All Labels' button are also visible. At the bottom, a red instruction reads: 'Select bold blue text to identify layers and button to learn more.'

Level II – Obtaining the ECG

Course Description

Level II of imPULSE 3.0 is a comprehensive review of electrocardiograms starting with how an ECG is captured. In this learning experience, recall waveform and paper basics, counting methods, and waveform measuring. View anatomical landmarks, select and prep electrode sites, and interactively place leads based on current guidelines. Learn proper lead placement for diagnostic 12, 15, and 18-lead ECGs and 3, 5, and 6-lead bedside/telemetry monitoring. Understand the importance of accurate lead placement and how to competently intervene in various ECG capture and interference issues. Assess your progress as you work through the activity to reinforce knowledge and ensure confidence and competency.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Relate normal cardiac waveform components to anatomy and physiology.
2. Recall ECG paper basics and methods of rate calculation.
3. Describe the procedure for obtaining an ECG with correct electrode placement.
4. Differentiate between diagnostic and bedside (telemetry) ECG options.
5. Recognize issues that may affect the ECG, such as human error and interference, and identify how to correct them.

The screenshot displays the 'imPULSE 3.0 Chest Pain Competency Series' interface for 'LEVEL II Obtaining the ECG'. The left sidebar lists course objectives and topics, with 'Measure the Normal Waveform' selected. The main area features a 3D anatomical heart model, a central ECG waveform on a grid with labeled intervals (PR, ST, QT) and points (J Point), and a vertical column of buttons to add or show waveform components. A tooltip defines the R Wave as the first upward deflection of the QRS complex. The bottom of the interface includes a navigation bar with 'PREV', 'NEXT', and 'REPLAY' buttons, and a footer with the Apex Innovations logo and the text 'Select each button in order to build waveform and learn more. Select calipers to measure.'

Level III – ECG Rhythms

Course Description

Level III of imPULSE 3.0 provides an in-depth view of cardiac rhythms. This learning experience begins with basic conduction and continues with the presentation of cardiac rhythms based on their location of origination and specific characteristics. Learn a systematic method to review ECGs for improved understanding and rapid rhythm recognition. Utilize floating calipers to examine the nuances of each rhythm, and view valuable references, including possible causes, rhythm triage, and links to guidelines. The course provides you with periodic quizzes to reinforce rhythm recognition in a practice setting to ultimately improve knowledge!

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Recognize cardiac rhythms based on various types and locations of electrical stimulation.
2. Relate the physiology of cardiac conduction to various cardiac rhythms.
3. Interpret each component of the ECG waveform systematically.
4. Identify arrhythmias based on rate, appearance, and nuances.

The screenshot displays the imPULSE 3.0 interface for a Level III ECG Rhythms course. The main content area is titled "Junctional Escape Beat" and features a yellow warning sign graphic with the following text:

Junctional Escape Beat
Late beat originating in AV junction, occurring within an underlying rhythm, after SA node and atrial tissue fails to fire.
RATE - Dependent on the underlying rhythm
RHYTHM - Irregular due to escape beat
P WAVES - Absent before at least one QRS; if present, before, after or buried in QRS and inverted in leads II, III, aVF
PR INTERVAL - Less than 0.12 secs when measurable
QRS - Normal, < 0.12 secs

To the right of the text is a 3D anatomical diagram of the heart showing the AV junction. Below the text is an ECG waveform labeled "Six Second View" with a "Textbook Rhythm Lead II" label. The interface includes a navigation menu on the left, a top toolbar with icons for play, volume, zoom, search, and help, and a bottom instruction bar that reads: "Select each button to learn more. Open caliper and click instructions on how to use."

Level IV – 12-Lead ECGs

Course Description

Level IV of imPULSE 3.0 takes the mystery out of the 12-lead ECG. In this interactive experience, learn a systematic method for interpretation of the 12-lead ECG to give you increased confidence in your evaluation skills. Learn about normal layout, axis, deflection, and R-wave progression. Recognize ST-segment changes, including STEMI in the presence of bundle branch blocks. Zoom in on areas of cardiac ischemia and injury, as reflected on the 12-lead ECG, using the dynamic interface. Intelligent interactivity and practice quizzes are used throughout the course to enhance your learning, reinforce presented information, and allow you to assess your new knowledge.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Summarize indications, normal layout, and capture of a 12-lead ECG.
2. Identify vectors, axis, deflection, and R-wave progression.
3. Apply a systematic approach for 12-lead ECG interpretation.
4. Recognize 12-lead waveform changes in relation to ischemia and injury.
5. Distinguish between old and new myocardial infarction.

The screenshot displays the imPULSE 3.0 interface for Level IV: 12-Lead ECGs. The main content area shows a 12-lead ECG waveform with five colored buttons (Lateral, Inferior, Septal, Anterior, Posterior) for interactive learning. The text above the buttons reads: "Look carefully at waveform changes globally in all 12 leads, as they correspond to the actual location of change in the myocardium." The interface also includes a navigation bar with "PREV", "NEXT", and "REPLAY" buttons, and a sidebar menu with various ECG topics.

Level V – Acute Coronary Syndrome

Course Description

Level V of impULSE 3.0 raises awareness of the standards of care for patients with acute coronary syndrome (ACS). This educational experience reviews pathophysiology, risk factors, symptom presentation, the triage process, and current ACC/AHA treatment guidelines. Learn the importance of subtle waveform changes in the 12-lead ECG, including waveform progression, ST-segment monitoring, and the differences between old and new MI. Understand the use of cardiac troponin, reperfusion strategies, and time goals related to ACS care. Assess your ability to recognize ST elevation in the provided ACS case studies. Early symptom recognition, along with rapid diagnosis and treatment, are critical skills for emergency professionals to provide expert care and optimal outcomes for ACS patients.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Recognize risk factors associated with the pathophysiology of ACS and prevention strategies.
2. Differentiate between typical and atypical symptoms indicative of ACS.
3. Apply current guidelines from ACC/AHA for risk stratification and treatment of ACS.
4. Recall distinguishing features for STEMI and NSTEMI myocardial infarction.
5. Describe time goals, decision pathways, and treatment strategies in ACS care.

The screenshot displays the impULSE 3.0 interface for 'LEVEL V Acute Coronary Syndrome ACS Case Study 4'. The main content area is titled 'ST-Segment Monitoring' and includes the following text: 'During the observation phase, special attention should be given to the ST segment as subtle changes may suggest myocardial ischemia or injury.' Below this, it defines 'The ST segment:' and lists its characteristics: 'provides an electrical representation of the cardiac cycle from the end of ventricular depolarization to the beginning of ventricular repolarization' and 'begins at the end of the QRS complex and ends at the beginning of the T wave'. Three ECG waveforms are shown: 'Normal' (green), 'ST-Depression Ischemia' (orange), and 'ST-Elevation Injury' (red). At the bottom, it states 'Lead monitoring of an ST segment is suggested for:' followed by a list: 'Initial presentation of ACS', 'STEMI, NSTEMI, UA', 'Chest pain observation units', and 'Post PCI'. There are buttons for 'Lead Monitoring' and 'Considerations'. A footer note says 'Select each button for more information.'

Level VI – Advanced and Special Situations

Course Description

Level VI of imPULSE 3.0 presents advanced, special situations, which may occur in clinical practice and affect the ECG. In this learning experience, review specific conditions, including heart disease, electrolyte imbalance, drug use, conduction disorders, and more, along with expected ECG changes, possible causes, and clinical findings. Increase your knowledge by examining the 12-lead ECG depicting these situations and comparing them to normal. Use interactive tools to measure waveforms. Better patient outcomes are achievable through improved knowledge and competency.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Explain how changes in a patient's condition can affect the physiology of the heart and change the appearance of the QRS waveform.
2. Recognize abnormal ECG waveforms and key clinical observations related to drug use, electrolyte imbalance, and conduction disorders.
3. Identify various conditions affecting heart function such as heart disease, congenital anomaly, and other special situations.
4. Describe physical conditions or injuries which may affect heart physiology and the ECG waveform patterns.

The screenshot displays the imPULSE 3.0 interface for the 'Brugada Syndrome' module. The top navigation bar includes a 'LEVELS' dropdown, a play button, a speaker icon, a zoom icon, a search icon, a bookmark icon, an information icon, a lightbulb icon, and a key icon. Below the navigation bar, the title 'Brugada Syndrome' is centered. A text box explains that Brugada syndrome is a main cause of sudden death in young adults, caused by a right ventricular (electrical-sodium channel) conduction delay. The main content area features a 12-lead ECG strip with leads I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, and V6. The ECG shows ST-segment depression in leads V1-V3 and a right bundle branch block (RBBB) pattern. To the right of the ECG, a text box titled 'Brugada Syndrome' lists ECG findings (ST elevation in leads V1-V3 and RBBB) and clinical findings (sudden death or syncope, negative lab results, and treatment with an internal cardiac defibrillator). A sidebar on the left lists various ECG conditions, with 'Brugada Syndrome' highlighted. The Apex Innovations logo is at the bottom left, and a footer note says 'Use tabs, ruler, and zoom tools to learn more.'

Level VII – Excellence in ACS Care

Course Description

Level VII of impULSE 3.0 highlights individual and organizational excellence. This learning experience introduces quality initiatives and metrics to consider when planning care for acute coronary syndrome (ACS). Learn how multidisciplinary team collaboration is critical to promote efficient, effective, and optimal response times to save cardiac muscle and improve outcomes. Additional best practice information will assist with post-discharge care to help your patients stay healthy, regain their quality of life, and reduce their chance of readmission. A review of community education through Early Heart Attack Care education (EHAC) is presented to help you prepare families and neighbors to make the initial call for help.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Recognize the indicators of a quality cardiac response program.
2. Identify the critical time goals in the STEMI system of care.
3. Describe multidisciplinary best practices of care for STEMI patients.
4. Explain appropriate patient and family education goals to prevent readmissions.

LEVEL VII
Excellence in ACS Care

Emergency Care Quality

Timely reperfusion therapy is essential to save cardiac muscle from injury. Recommended time goals from first medical contact to transport decisions, interventions, and best practices are identified to help achieve optimal outcomes for the STEMI patient.

START → within 10 min → within 30 min → within 45 min → within 90 min → within 120 min

Select decision tree, L-R, starting with FMC and ending with PCI exception.

Level VIII – ECG Library

Course Description

Level VIII of imPULSE 3.0 is a non-CE awarded course that includes the reference library, filled with over 100 12-lead ECG's, current guidelines, and relevant information.

Course Objectives

At the conclusion of this educational activity, the participant should be able to:

1. Understand nuances associated with different types of ECG rhythms.
2. Review appropriate guidelines and relevant best practices for emergency care.

The screenshot displays the imPULSE 3.0 ECG Library interface. On the left, a navigation menu lists 'LEVEL VIII ECG Library' and other options. The main area shows a '12-Lead ECG Library' with six sticky notes representing different ECG categories: 'ECGs with MI', 'ECGs with Ischemia', 'ECGs with Pacemaker', 'ECGs with Arrhythmia', 'ECGs with Block', and 'Miscellaneous ECGs'. The interface includes a top navigation bar with various icons and a bottom navigation bar with 'PREV', 'NEXT', and 'REPLAY' buttons. The Apex Innovations logo is located in the bottom left corner.

Level IX – Early Heart Attack Care

Course Description

The **Early Heart Attack Care** course delivers the signs, symptoms and symbols of early heart attack care. This free educational program is authored by Dr. Raymond Bahr and promoted by the ACC Accreditation Services (formerly Society of Cardiovascular Patient Care). EHAC stresses the message that heart attacks have beginnings and the public can help with recognition and response as well as pledge to act to save a life.

Course Goals

Primary Goals:

- Learn that heart attacks have beginnings.
- Focus on interventions during the beginning of a heart attack.

Secondary Goals:

- Teach the public that early intervention is required to save lives of patients having a heart attack.
 - Call 911: this starts the treatment earlier and supports timely response by hospital staff
 - Bystander support: insist the patient get medical attention
 - Impact of delay: loss of time is equated to loss of heart muscle
- Encourage hospitals to teach EHAC along with CPR.
- Encourage hospitals to establish a comprehensive plan for patients with chest pain with emphasis on early heart attack care.

impULSE3.0
Chest Pain Competency Series

LEVEL IX
Early Heart Attack Care

Prior to Beginning

Course Goals

What is EHAC?

Importance of EHAC

Heart Attack

Risk Factors

Recognize Heart Attack

Bystander Response

Questions to Ask

Let's Review

Listen to Your Heart

EHAC Goal

Educate

Founder - Dr. Bahr

Test Out

What is EHAC?

What is EHAC?
Early Heart Attack Care

- ◆ EHAC is a public awareness campaign intended to educate the public about the early warning signs and symptoms of an impending heart attack.
- ◆ Early treatment can prevent a death or damage to the heart.
- ◆ This is an educational site, but if you are having any chest pain symptoms, please call 911 immediately.

Apex Innovations
Improving Outcomes Through Education

imPULSE 3.0

Continuing Education Information

	Levels	Testing Min.	CNE	CME	CPE	CEH	FL CEH
I	Cardiac Anatomy & Physiology	45	2.50	2.00	2.00	2.50	2.50
II	Obtaining the ECG	45	3.00	2.00	2.00	2.50	2.50
III	ECG Rhythms	45	4.00	3.00	3.00	3.50	3.50
IV	12-Lead ECG	60	4.50	4.00	4.00	4.00	4.00
V	Acute Coronary Syndrome	45	3.50	3.00	3.00	3.00	3.00
VI	Advance & Special Situations	60	4.50	4.00	4.00	4.00	4.00
VII	Excellence in ACS Care	45	2.00	2.00	2.00	2.00	2.00
VIII	ECG Library	Untimed	--	--	--	--	--
IX	EHAC	Untimed	--	--	--	--	--
	TOTAL	345	24.00	20.00	20.00	21.50	21.50

JA. In support of improving patient care, Apex Innovations is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC) to provide continuing education for the healthcare team.

24 CNE. Apex Innovations designates this enduring material for 24 ANCC contact hours for nurse.

20 CME. Apex Innovations designates this enduring material activity for a maximum of 20 *AMA PRA Category 1 Credits™*. Physicians should claim only credit commensurate with the extent of their participation in the activity.

20 CPE. Apex Innovations designates this knowledge-based enduring material for 20 ACPE contact hours for pharmacists.

21.5 CEH. This CE activity is accredited for 21.5 CEH by Apex Innovations, an organization accredited by the Commission on Accreditation for Prehospital Continuing Education (CAPCE).

21.5 FLCEH. Apex Innovations has been approved by the Florida Emergency Medical Services as an educational provider for EMS and Paramedics continuing education hours and have course completion roster and tracking number available on the CE Broker website.