IBHRE INTERNATIONAL BOARD OF HEART RHYTHM EXAMINERS

IBHRE Certification Candidate Handbook
for the Physician and Allied Professional

Certified Cardiac Device Specialist
Physician and Allied Professional

Certified Electrophysiology Specialist
Allied Professional

Certified Electrophysiology Specialist - Adult
Physician

Certified Electrophysiology Specialist - Pediatric
Physician

Cardiac Device Remote Monitoring Specialist
Allied Professional

Welcome Heart Rhythm Management Professional!

Congratulations on taking the first step toward earning an internationally recognized certification in heart rhythm management. The International Board of Heart Rhythm Examiners (IBHRE®) has established itself as a certifying body to promote the highest standards of cardiac rhythm management and to recognize cardiac care professionals who have mastered this unique subspecialty. By choosing to review this Handbook, you have taken the first step toward joining a select group of physicians and allied professionals who have distinguished themselves by earning certification through IBHRE.

IBHRE offers certifications based in specific areas of the heart rhythm management field. Each certification can be obtained by meeting IBHRE qualifications and successfully passing a computer-based examination. These certifications include:

- Certified Cardiac Device Specialist (Physician and Allied Professional) CCDS
- Certified Electrophysiology Specialist (Allied Professional) CEPS
- Certified Electrophysiology Specialist - Adult (Physician) CEPS-A
- Certified Electrophysiology Specialist - Pediatric (Physician) CEPS-P
- Cardiac Device Remote Monitoring Specialist (Allied Professional) CDRMS

This handbook summarizes key aspects of the IBHRE® certification programs and is intended to help you understand the process toward earning and maintaining IBHRE certification. Now that you are preparing to take the examination, this handbook will serve as a valuable reference to:

- Understand the IBHRE certification process
- Gather the appropriate eligibility materials to submit your exam application
- Study and prepare for the IBHRE physician or allied professional examination
- Maintain IBHRE certification after passing

IBHRE exams are developed by international experts in the field of heart rhythm management in conjunction with a contracted testing agency. The exams test competencies necessary to provide quality patient care in cardiac pacing, electrophysiology, and device remote monitoring.

This handbook cannot address every potential question, policy detail or program change. It will, however, supplement program information provided on the IBHRE website (IBHRE.org). You may also contact IBHRE staff at info@ibhre.org with additional questions.

Good luck and best wishes on earning an IBHRE certification.

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President IBHRE Board of Directors

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SECTION I: About IBHRE

Item 1: IBHRE Mission Statement

The mission of the International Board of Hearth Rhythm Examiners (IBHRE) is to promote optimal outcomes for heart rhythm patients by providing certification services that validate specialized knowledge and continuing competence in heart rhythm management.

Item 2: Organizational History

IBHRE is a nonprofit credentialing organization based in Washington, DC. Established in 1985 as NASPExAM, IBHRE is a self-governing, credentialing organization that provides competency certification in the fields of cardiac rhythm device therapy and cardiac electrophysiology for physicians and allied professionals. The initial IBHRE examination was created for physicians. In 1989, a similar examination was developed for allied professionals (e.g., nurses, physician assistants and those employed in industry). In 1997, IBHRE added a third examination in the specialty of cardiac electrophysiology for the allied professional. In 2011, IBHRE introduced examinations in adult and pediatric cardiac electrophysiology. The Cardiac Device Remote Monitoring Specialist certification exam was launched in 2021.

SECTION II: Certification Program

Item 1: What is IBHRE Certification?

IBHRE certification is an unparalleled recognition in the field of heart rhythm management that is achieved by successful completion of an exam based upon a global standard of knowledge. IBHRE certification benefits the profession and the practitioner by:

- Improving the quality of patient care
- Setting standards of clinical competency for the practice of cardiac arrhythmia management
- Encouraging ongoing learning and improvement required for professional excellence over a lifetime of practice
- Helping physicians and allied professionals maintain the quality of their educational experience and providing worldwide recognition of their qualifications
- Encouraging the sharing of knowledge
- Enhancing the credibility of the certified individual and the employer

IBHRE certification is highly sought after by international physicians and allied professionals. As the first and oldest organization to establish an exam in pacing and electrophysiology, the rich history of the exams and their unique position to measure competency in the specialty of cardiac rhythm device management and cardiac electrophysiology is now used as a model to certify physicians and allied professionals worldwide.

Item 2: Why Become Certified?

Heart rhythm professionals from around the world have demonstrated their competency in cardiac pacing, implantable defibrillation and electrophysiology by taking and passing the IBHRE examination. Achieving certification is an investment in one's career and one's professional and personal development.

Becoming certified by IBHRE enables physicians and allied professionals to:

- Validate knowledge essential to the practice of heart rhythm management
- Gain competitive advantage
- Elevate their status in the field
- Demonstrate commitment to the highest standard of patient care
- Achieve international recognition
- Meet professional employer, state or federal requirements
- Meet government and health ministry requirements
- Meet training guidelines and recommendations for practice
- Increase opportunities for career advancement
- Enhance professional reputation

Item 3: IBHRE Examinations

IBHRE offers the following certification examinations:

- Certification Examination for Competency in Cardiac Rhythm Device Therapy for the Physician and Allied Professional for CCDS certification
- Certification Examination for Competency in Cardiac Electrophysiology for the Allied Professional for CEPS certification
- Certification Examination for Competency in Electrophysiology for the Physician - Adult for CEPS-A certification
- Certification Examination for Competency in Electrophysiology for the Physician - Pediatric for CEPS-P certification
- Certification Examination in Cardiac Device Remote Monitoring for the Allied Professional for CDRMS certification

IBHRE also offers the Certified Cardiac Device Specialist – Japan Device Representative (CCDS-JDR) which is administered in collaboration with Japan CDR Center (JCC) and Japan Heart Rhythm Society (JHRS).

Successful completion of IBHRE exams is not a requirement to perform or participate in pacemaker related and/or electrophysiology therapy and does not attest to the overall capability or competency of any physician or allied professional. These certification examinations are written examinations only and do not include any testing in a practical setting. IBHRE does not intend to interfere with or to restrict the professional activity of a licensed physician because the physician has not successfully earned IBHRE certification. Similarly, IBHRE does not intend to interfere with or to restrict the professional activity of an allied professional because of these processes.

Item 4: Accreditation

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17024
PERSONNEL CERTIFICATION BODY

IBHRE adheres to standards as set by the ANSI National Accreditation Board (ANAB) under ANSI/ ISO/IEC 17024 (General Requirements for Bodies Operating Certification Systems of Persons). ANSI standards are established with the International Organization of Standardization (ISO) to establish worldwide consensus to provide rigorous guidelines for products, services and sound practices.

ANSI is a global leader in operating standards and conformity assessment systems. Due to its rigorous assessment process, ANSI represents the highest standard in personnel certification accreditation. Achieving and maintaining accreditation is part of an ongoing commitment to add value to the exam body and signify to our certified professionals, exam candidates and the medical community that the IBHRE certification programs adhere to the highest standards in credentialing.

The ANSI National Accreditation Board (ANAB) is a non-governmental organization that provides accreditation services and training to public- and private-sector organizations serving the global marketplace. ANAB is the largest accreditation body in North America and provides services in more than 75 countries.

SECTION III: Exam Information

Item 1: Exam Development

IBHRE certification examinations are written and developed by members of the IBHRE test writing committees. The Physician and Allied Professional Pacing Test Writing Committee is responsible for developing the cardiac rhythm device therapy examinations for physicians and allied professionals. The Allied Professional Electrophysiology Test Writing Committee is responsible for developing the electrophysiology examination for allied professionals. The Physician Electrophysiology Test Writing Committee is responsible for the development of the electrophysiology examination for physicians (Adult and Pediatric). The Device Remote Monitoring Test Writing Committee is responsible for developing the cardiac device remote monitoring examination for allied professionals.

The questions developed for each exam are determined by an exam blueprint (also referred to as exam content outline), which indicates the percentage of items that are required for each exam topic area. Periodic task analysis studies are performed to determine appropriate topics for inclusion on the exam blueprints. Task analyses carefully assess any updates or changes that may have occurred in the field over time. Regularly updating the exam blueprints ensures that the questions included on the examinations are relevant and accurately measure the most up-to-date advances in the field. The IBHRE task analysis studies also provide examinees and employers the basis of a valid, reliable, fair and realistic assessment that reflects the skills, knowledge and abilities required for competent job performance.

Development of multiple-choice items and exam forms is carried out by subject matter experts in conjunction with PSI. The cardiac device and allied professional EP exams consist of 200 items and the physician EP exams consist of 175 items. The CDRMS exam consists of 150 items. All items, including those with statistical examination histories, are reassessed to ensure validity. Items are meant to measure core knowledge that certification candidates should know regardless where they are located.

Item 2: Exam Topics

IBHRE exams are designed to evaluate the extent of a candidate's knowledge and clinical judgment in areas where an arrhythmia specialist should demonstrate a high level of competency. Exam content is consistent with a Exam Content Outline. The majority of questions are based on patient scenarios in inpatient, outpatient and emergency department settings. Exam questions are designed in such a way that they require the examinee to draw from training, education and practical experience in the health care environment as well as information from textbooks and scholarly journal articles in order to reach the correct conclusion. Some questions involve interpretation of images, such as electrocardiograms and radiographs.

Item 3: Exam Scoring

IBHRE exam's are scored using psychometric procedures to ensure validity and reliability. Following an exam administration, questions are statistically evaluated to determine whether any items did not correlate with examinee performance or whether any incorrect multiple-choice options were selected by a substantial group of examinees. In some cases, such items may be removed by the test-writing committee from consideration for final scoring if, after careful consideration, they are deemed flawed or inappropriate. The final scoring of the examination is based on the number of questions and correct answers that have been accepted as suitable.

Candidate scores are determined by the number of questions answered correctly. (There is no penalty for guessing). While IBHRE strongly recommends that candidates attempt to answer every question, failure to complete every question does not immediately imply failure of the exam. The minimum passing score applied to each exam reflects a standard developed by subject matter experts. The standard is determined based on the results of a content-based standard-setting study and is partially dependent upon the relative performance of the entire testing group.

Item 4: Score Reliability

The examination score is an estimate of the examinee's knowledge. All IBHRE certification examinations are carefully measured and evaluated by a psychometrician to ensure that each examination score provides reliable estimates of proficiency. With the advancement of computer-based testing, the process of collecting information electronically has practically eliminated the risk of human error in evaluating examinations.

Item 5: Exam Administration

All IBHRE exams are administered via computer annually at PSI test centers. Candidates approved to take the exam are emailed detailed instructions, which enables them to schedule their testing appointment at a testing center near them on the assigned exam date. For more information, see Item 11: Scheduling Exam Appointments. Up to five hours are allocated for exam appointments (refer to scheduling confirmation for appointment duration) unless special accommodations, have been arranged. Exam start times vary due to differences in international time zones and the schedules of individual test centers.

Item 6: Exam Language and Format

IBHRE certification exams are administered in English.

Item 7: Exam & Question Format

Exam questions are presented in multiple-choice format where only one answer is considered correct. For security purposes, PSI randomizes the order of exam questions as they are delivered through computer-based testing. A typical question will consist of a brief statement, case history and a graph or picture followed by the question and a list of possible answers. Examinees must select the correct answer to receive credit toward their score. It is recommended that candidates familiarize themselves with the question format prior to the exam. Refer to Section 5: Exam Resources in this Handbook for more information.

Note: Effective May 2018, the Physician EP exams are administered every other year (2024, 2026, 2028, etc.) Visit IBHRE.org for more information.

Item 8: Exam Content Outline: CCDS

1. Fundamentals of Electrophysiology and Electronics	5%
1A. Anatomy and Physiology of the Heart and Conduction System	
1.A.1. Basic anatomy (e.g., Bachman's bundle, RAA, RVOT, RV Sep tum, RVA, CS, cardiac veins, epicardial pacing)	
1.A.2. Common congenital anomalies	
1.B. Pathophysiology and Mechanisms of Action of Dysrhythmias	
1.C. Electrophysiology of Dysrhythmias (e.g., recognition, management, treatment)	
1.C.1. Re-entry circuits	
1.C.2. Triggered arrythmias	
1.D. Pharmacology	
1.D.1. Drug effects on device function (e.g., impact on pacing and defibrillation thresholds, impact on pacing frequency)	
1.D.2. Drug effects on cardiac rhythm and conduction	
1.D.3. Anticoagulation	
1.E. Electronics (e.g., sensing, stimulation, defibrillation)	
1.E.1. Basic quantities (e.g., ampere, charge, ohm, volt, hertz)	
1.E.2. Derived quantities (e.g., resistance, capacitance, battery capacity)	
1.E.3. Relationships (e.g., Ohm's Law, power, energy)	
1.E.4. Wave Forms	

2. Applied Science and Technology	30%
2.A. Pulse Generators	
2.A.1. Energy sources (battery chemistry and rationale)	
2.A.2. Electronic circuit components; capacitors, resistors, diodes	
2.A.3. Sensors (e.g., motion/accelerometer, MV, impedance [CLS])	
2.A.4. Software [Firmware]	
2.A.5. Charge time	
2.B. Leads and Electrode Material	
2.B.1. Insulation (e.g., silicone, urethanes, hybrids)	
2.B.2. Conductors (e.g., composition coaxial, cable, coradial)	
2.B.3. Connectors/Adapters (e.g., IS1, DF-1, DF4, LV-4)	
2.B.4. Electrodes (e.g., active, passive, steroid elution, OTW, tip coating)	

2. Applied Science and Technology (Continued)	**30%**
2.B.5. Quadripolar Pacing/Multipoint Pacing (MPP)	
2.B.6. Shock coil (e.g., integrated versus true bipolar)	
2.C. Sensing	
2.C.1. Cardiac signals (EMGs, sensing amplifiers, filters, slew rate, far field, cross-chamber)	
2.C.2. Extracardiac signals (e.g., myopotentials, EMI)	
2.D. Stimulation	
2.D.1. Anode/Cathode stimulation	
2.D.2. Stimulation/Defibrillation threshold	
2.D.3. Acute to chronic shift	
2.D.4. Ohm's law (e.g., calculation of current, voltage, impedance)	
2.D.5. Application of strength duration curve, stimulation threshold, and the Wedensky effect	
2.D.6. Power and energy	
2.D.7. Diaphragmatic stim, vagal stim, and phrenic nerve stim	
2.E. Timing Cycles	
2.E.1. Single chamber	
2.E.2. Dual chamber (e.g., ventricular based, atrial based, hybrid)	
2.E.3. Rate modulation	
2.E.4. CRT (Biventricular)	
2.E.5. NBG code	
2.E.6. Leadless devices timing cycle	
2.F. Algorithms	
2.F.1. Bradycardia/Tachycardia pacing therapy	
2.F.2. Tachyarrhythmia detection	
2.F.3. SVT discrimination	
2.F.4. Antitachyarrhythmia pacing	
2.F.5. CRT programming strategies (e.g., multi-point pacing, anodal stim, offset)	
2.F.6. Physiologic pacing strategies (e.g., HIS, LBB pacing)	
2.F.7. Algorithms for special situations (e.g., MRI)	
2.F.8. Indication based device selection and programming	
2.G. Defibrillation Concepts (e.g., R on T, high-frequency, upper limits, single versus dual-coil leads, thresholds, patient selection, therapy programming)	
2.G.1. S-ICD (e.g., limitations, selecting appropriate vector, screening and patient selection, recalls)	
2.G.2. Wearable ICD	
2.H. Physiologic Monitors (Implantable) (e.g., implantable loop recorders)	
2.I. Wearable Monitors	

3. Electrocardiography	4%
3.A. Electrocardiogram	
3.A.1. Paced rhythms (e.g., normal pacing, location of pacing, RV out flow track, CRT, selective and non-selective HIS, left bundle branch pacing)	
3.A.2. CIED malfunction	
3.A.3. Pseudo-malfunction (e.g., upper rate behavior, AV hysteresis, pacing into physiologic non-capture, reverse mode switching, sleep mode)	
3.A.4. ECG magnet application	
3.A.5. ECG for challenging device interrogation	
3.B. Recognition of Dysrhythmias (e.g., device mediated vs native dysrhythmias)	

4. Clinical Assessment	3.5%
A. History	
4.A.1. Patient history (e.g., patient symptoms, past medical history, medication history, family history, occupation and lifestyle)	
4.A.2. Device system history (e.g., patient response to device therapy, abandoned leads, original indication for implant, date/type of implant, previous implants, revisions and replacements)	
4.A.3. History of arrhythmia (e.g., rate versus rhythm control, pacer dependent or not, history of ventricular tachyarrhythmia, pacing burden/percentage trends)	
4.B. Physical Exam	
4.C. Diagnostic Tests to Determine Underlying Pathology and Appropriate Device Selection	
4.C.1. Invasive	
4.C.2. Noninvasive	

5. Perioperative Practice/Clinical Practice	22.5%
5.A. Indications for Device Therapy and Placement	
5.A.1. Bradyarrhythmias	
5.A.2. Tachyarrhythmias	
5.A.3. Syncope/A-Fib (for ILRs)	
5.A.4. Major pediatric indications	
5.B. Chronic Heart Failure	
5.B.1. Systolic	
5.B.2. Diastolic	
5.B.3. Electrical dyssynchrony	
5.B.4. Tachycardia mediated	
5.B.5. Congenital	
5.B.6. Pacing induced cardiomyopathy	

5. Perioperative Practice/Clinical Practice (Continued)	**22.5%**
5.B.7. Programming considerations with heart failure cardiac devices (e.g., LVADs, CardioMEMS, Cardiac Contractility Modulation [CCM])	
5.C. Device and Feature Selection	
5.C.1. Sinus node dysfunction (e.g., atrial bradyarrhythmia)	
5.C.2. Atrioventricular block	
5.C.3. Hemodynamics	
5.C.4. Pacing for tachyarrhythmias	
5.C.5. Atrial fibrillation	
5.C.6. Neurocardiogenic syncope	
5.C.7. MRI compatibility considerations	
5.D. Surgical Technique	
5.D.1. Patient preparation (e.g., informed consent, documentation, chart review)	
5.D.2. Implantation	
5.D.2.a. intraoperative testing	
5.D.2.b. surgical procedure (e.g., lead placement)	
5.D.2.c. sedation (e.g., IV analgesia, monitoring requirements)	
5.D.2.d. DFT testing (e.g., yes/no, typical DFT versus upper limit of vulnerability)	
5.D.2.e. subcutaneous	
5.D.2.f. leadless pacemaker	
5.D.2.g. venous access	
5.D.2.h. coronary sinus canulation	
5.D.2.i. device pouches/antibiotic envelopes	
5.D.2.j. epicardial lead placement	
5.D.2.k. optimal electrophysiologic LV lead placement sites (e.g., QLV, RVLV delay)	
5.D.2.l. physiologic pacing sites	
5.D.3. Lead/pulse generator removal/extraction	
5.D.3.a. a. tools for extraction (e.g., lead locking stylets, powered sheaths, snaring tools, bridge balloon, laser versus mechanical tools)	
5.E. Surgical Complications	
5.E.1. Intraoperative	
5.E.2. Postoperative	
5.F. Pediatric Pacing (e.g., congenital anomalies/surgical issues)	
5.G. End of Life Issues (e.g., defibrillator deactivation, pacing therapy withdrawal, cremation, device reuse) *[English exam Only]*	

6. Safety	3%
6.A. Infection Control	
6.B. Sterile Technique	
6.C. Radiation Safety	
6.D. Device EMI Interaction	
6.E. Electrocautery	
6.F. Other Electronic Devices	

7. Patient and Device Follow-Up Management	28%
7.A. Assessment (e.g., history, appropriate physical exam)	
7.B. Diagnostics	
7.C. Programming	
7.D. Device Assessment/Follow-up	
7.D.1. Clinical (e.g., rhythm therapy, rate modulation, hemodynamics)	
7.D.2. Technological (e.g., assessment of capture/sensing)	
7.D.3. Natural history of pulse generators/leads (e.g., lead maturation, pulse generator longevity, ERI, EOL)	
7.D.4. Programming optimization	
7.D.5. Sensing problems (e.g., oversensing, under-sensing, subcutaneous [SUBQ] devices)	
7.D.6. Stimulation problems (e.g., failure to capture, anodal capture, phrenic nerve stimulation)	
7.D.7. Device troubleshooting and optimization (e.g., patient device interactions, battery life management)	
7.D.8. Acute and chronic lead issues	
7.D.9. Mode switch	
7.D.10. Pacemaker syndrome (e.g., inappropriate programing)	
7.D.11. Epicardial lead follow-up and management	
7.E. Pacing System Complications	
7.F. Remote Monitoring	
7.F.1. Cyber security	

8. Radiology	4%
8.A. X-ray analysis	
8.A.1. Implantation	
8.A.2. Follow-up	
8.B. Fluoroscopy (e.g., assessing lead placement, LV lead placement)	
8.C. CT scans (e.g., lead perforation, leads in the appropriate chambers, left persistent SVC)	

Item 9: Exam Content Outline: CEPS (Allied Professional)

1. Physics of Electrophysiology	5%
1.A. Units and Relationship of Measurement	
1.A.1. Basic quantities	
1.A.2. Derived Quantities	
1.B. Signal Concepts	
1.C. Electronic Circuitry; Filter Settings	
1.D. Biophysics of ablation	

2. Cardiac Anatomy and Physiology	10%
2.A. Cardiac Anatomy	
2.B. Hemodynamics of the Cardiovascular System	
2.C. Anatomy of the Conduction System	
2.D. Electrophysiology of the Conduction System	
2.E. Anatomy and physiology of acquired, inherited and iatrogenic cardi ac conditions	

3. Pharmacology	6%
3.A. Types of drugs and their pharmacokinetics in electrophysiology	
3.B. Anticoagulation	
3.C. Intravenous Sedation, Analgesia, and Reversal Agents in the EP Lab	
3.D. Drug and Device Interaction	
3.E. Drug Effects on Cardiac Rhythm and Conduction	
3.F. Electrophysiology specific drug indications/contraindications and side effects	

4. Fundamentals of Electrophysiology	20%
4.A. Normal conduction system properties/intervals	
4.B. Electrophysiology of the Conduction System; Action Potential	
4.C. Abnormalities of the Conduction System	
4.D. Mechanisms of Arrhythmia	

5. Clinical Assessment	8%
5.A. Patient cardiac history	
5.B. Physical Assessment	
5.C. Clinical assessment of arrhythmia	
5.D. Diagnostic Tests, Indications, and Evaluation	
5.D.1. Tilt table testing	
5.D.2. Ambulatory and invasive ECG monitoring	
5.D.3. Stress testing	
5.D.4. Echocardiography: TEE	
5.D.5. Novel noninvasive diagnostic testing	
5.D.6. MRI, CT	
5.D.7. 12 lead ECG/telemetry monitoring	

5. Clinical Assessment (Continued)	**8%**
5.D.8. Response to drugs	
5.D.9. Response to vagal maneuvers	
5.E. Electrocardiography	
5.E.1. Normal Electrocardiogram Recognition	
5.E.2. ECG Recognition of Arrhythmia Type and Mechanism	
5.E.3. ECG localization of ectopic morphologies and pathway locations	
5.E.4. Recognition of Device Paced ECG	
5.F. Inherited Arrhythmia Syndromes, Channelopathies	
5.F.1. Indications of genetic testing	
5.F.2. Provocation testing	
5.G. Initial assessment/Diagnostic Workup	

6. Laboratory Considerations	**10%**
6.A. Laboratory Supplies, Equipment, Maintenance, Connectology, Troubleshooting	
6.B. Patient Preparation for Procedure	
6.C. Access Techniques, Trans-septal Approach, Epicardial Approach	
6.D. Recording Modalities/Signal Acquisition	
6.E. Risks of Complications	
6.F. Informed Consent/Documentation/Chart Review	
6.G. Infection Control	
6.H. Sterile Technique	
6.I. Radiation Physics/Safety	
6.J. Electrical Safety	
6.K. Drug interaction	
6.L. Device Interaction	
6.M. Management of Complications and Emergencies	

7. Invasive Electrophysiology	**30%**
7.A. Indications, Contraindications for EP study	
7.B. Baseline Assessment, Calculations, Interval Measurements	
7.C. Methods of Recording and Evaluation	
7.C.1. Intracardiac recording and recognition	
7.C.2. Assessment of conduction system	
7.C.3. Determination of refractory periods	
7.D. Differential Diagnostic Pacing	
7.E. Surface ECG Morphology During Intracardiac Pacing	
7.F. Evaluation of Arrhythmia	
7.F.1. Narrow complex supraventricular tachycardia	
7.F.2. Wide complex supra/ventricular tachycardia	

7. Invasive Electrophysiology (Continued)	**30%**
7.F.3. Response to programed stimulation	
7.F.4. Response to drugs	
7.F.5. Differentiation of arrhythmia mechanisms	
7.G. Emergency management	
7.H. Left atrial appendage occlusion or closure	
7.I. Biophysics of ablation	
7.J. Ablation strategies (e.g., anatomical locations/desirable signals)	
7.K. Autonomic modulation therapies	
7.L. Surgical Therapy (e.g., structural heart, MAZE)	
7.M. Electroanotomical/3D mapping	
7.N. Novel Mapping Technologies	
7.O. Pediatric considerations	

8. Implantable Devices (Pacemaker, ICD, CRT, Loop Recorder)	**5%**
8.A. Pacemaker Modes, Basic Timing Cycles, and algorithms	
8.B. Implanted Devices Therapy, Programming, and Interpretation	
8.C. Indications for Implantation of Devices	
8.D. Implant Troubleshooting	
8.E. Recognition of Device Problems:EMI, Sensing, Capture, Inappropriate Therapy, Implantation Techniques, MRI, Remote Monitoring	

9. Real-time and Diagnostic Imaging (TTE, TEE, Fluoroscopy, ICE, Chest X-Ray)	**5%**
9.A. Interpretation: Implanted Devices	
9.B. Interpretation: Clinical Symptoms/Diagnosis	
9.C. Interpretation: Catheter Positions	
9.D. Interpretation of abnormal structures or motion	

10. Research Methodology & Interpretation	**1%**
10.A. Clinical trial methodology/statistical analysis	
10. B. Major clinical study results	

Item 10: Exam Content Outline: Shared Core Sections for CEPS-A and CEPS-P (Physician)
Refer to Item 12 and Item 13 for specialty specific content.

1. Core Section 1	20%
1.A. Cardiac Anatomy and Physiology	
1.B. Pharmacology of – Antiarrhythmic Drugs and Anticoagulation	
1.B.1. Applications in specific arrhythmias	
1.B.2. Pharmacokinetics, pharmacodynamics, pharmacogenetics	
1.B.3. Drug interactions	
1.C. Surface Electrocardiography	
1.C.1. Normal Electrocardiogram, Recognition	
1.C.2. ECG Recognition of Arrhythmia Type and Mechanism	
1.C.3. ECG localization of ectopic morphologies, pathway locations, and ventricular tachycardia	
1.C.4. Recognition of Device Paced ECG	
1.D. Clinical Patient Assessment and Clinical Electrophysiology	
1.D.1. Clinical history, examination, diagnostic workup, non-invasive tests	
1.D.1.a. No structural heart disease	
1.D.1.b. Acquired structural heart disease	
1.D.1.c. Congenital heart disease	
1.D.1.d. Inherited arrhythmia syndromes, channelopathies	
1.D.2. Clinical evaluation of arrhythmia	
1.D.2.a. Response to drugs	
1.D.2.b. Response to automatic maneuvers, diagnostic maneuvers	
1.D.2.c. Emergency management of arrhythmia, symptoms	

2. Core Section 2	40%
2.A. Fundamentals of Electrophysiology	
2.A.1. Normal conduction system properties/intervals	
2.A.2. Cellular electrophysiology; Action Potential, ion channels, gap junctions	
2.A.3. Abnormalities of the conduction system	
2.A.4. Mechanisms of arrhythmia	
2.B. Electrophysiology Procedures	
2.B.1. Catheterization techniques, transseptal catheterization; intracardiac echocardiography, transesophageal echocardiography, epicardial access	
2.B.2. Techniques for device implantation and extraction	
2.B.3. Surgical management of arrhythmias	
2.B.4. Procedural risks, complications; recognition and management of complications	
2.B.5. Radiation safety	
2.C. Invasive Electrophysiology	
2.C.1. Indications, Contraindications for EP study	
2.C.2. Baseline assessment, Calculations, Interval Measurements	
2.C.3. Methods of electrogram recording and evaluation	

2. Core Section 2 (Continued)	40%
2.C.4. Stimulation protocols	
2.C.5. Evaluation of arrhythmias	
2.C.2.a. Differentiation of arrhythmias	
2.C.2.b. Response to pacing maneuvers	
2.C.2.c. Response to antiarrhythmic drugs	
2.C.2.d. Evaluation of arrhythmias post ablation	
2.D. Catheter Mapping and Ablation	
2.D.1. Methods/strategies	
2.D.2. Biophysics of ablation	
2.D.3. 2D and 3D Mapping/ablation of arrhythmias	
2.D.3.a. SVT	
2.D.3.b. VT	

3. Core Section 3	11%
3.A. Implantable Devices (Pacemaker, ICD, CRT, Loop recorder)	
3.A.1. Fundamentals of electronics, pacemaker modes and timing cycles	
3.A.2. Indications and Contraindications for implantation of devices, implant testing and troubleshooting	
3.A.3. Pacemaker therapy, programming, antitachycardia pacing, algorithms	
3.A.4. ICD therapy, programming, detection algorithms, discrimination algorithms	
3.A.5. CRT therapy, programming, optimization	
3.A.6. Implantable loop recorder / cardiac monitor diagnostic assessment, programming	
3.A.7. Recognition and management of device problems: EMI, sensing, capture, inappropriate therapy	
3.A.8. Device follow-up	
3.B. Imaging in EP	
3.B.1. Fluoroscopic or Radiographic Interpretation: Implanted devices	
3.B.2. Fluoroscopic or Radiographic Interpretation: Clinical Symptoms/ Diagnosis	
3.B.3. Fluoroscopic or Radiographic Interpretation: Catheter positions and Angiograms	
3.B.4. CT, PET CT, MRI, Echo	
3.C. Sedation and Anesthesia in the EP Lab	
3.D. Research and Clinical Trials	
3.D.1. Research Ethics	
3.D.2. Clinical trial methodology/statistical analysis	
3.D.3. Major clinical study results	

Item 11: Exam Content Outline: CEPS-A (Physician)

For Core Sections 1 – 3, refer to pages 17-18.

4. Adult Section 1	9%
4A .A. Pharmacology in Adult Population	
4A.A.1. Antiarrhythmics, antihypertensives, diuretics, ACE inhibitors, statins, heart failure medications	
4A.A.2. Anticoagulation management in adult population	
4A.B. Clinical Assessment and Clinical Electrophysiology in Adult Population	
4A.B.1. Arrhythmias in co-morbid conditions	
4A.B.1.a. Coronary artery disease, renal disease, liver disease, diabetes, stroke, pulmonary disease, valvular heart disease, inflammatory heart disease, heart failure, post cardiac surgery or valve implantations	
4A.B.1.b. Adult congenital heart disease, cardiomyopathies	
4A.B.2. Arrhythmias in pregnancy, athletes, post heart transplant	
4A.B.3. Cellular Electrophysiology, Autonomics, Genomics of Sudden Cardiac Death in Adult Population	
4A.B.4. Syncope evaluation and management	

5. Adult Section 2	13%
5A.A. Invasive Electrophysiology in Adult Population	
5A.A.1. Procedural indications and contraindications	
5A.A.2. Atrial arrhythmias / Atrial fibrillation / Atrial flutter	
5A.A.3. Ventricular arrhythmias (associated with ischemic heart dis ease, cardiomyopathies, genomic syndromes, adult congenital heart disease)	

6. Adult Section 3	7%
6A.A. Applications of Implantable Devices (Pacemaker, ICD, CRT, Loop recorder, Left atrial appendage occlusion devices) in Adult Population	
6A.A.1. Indications and uses of implantable devices to manage or to diagnose arrhythmias (including leadless vs transvenous pacing, subcut vs transvenous ICD's, conduction system pacing)	
6A.A.2. Recognition and management of device implant complications; Lead extraction in adults and adult congenital heart disease patients	
6A.A.3. Geriatrics, end of life management, device deactivation, ethics	
6.B. Translation from Clinical Research to Adult Patient Management	
6A.B.1. Clinical trials in implantable devices	
6A.B.2. Clinical trials in Electrophysiology	

Item 12: Exam Content Outline: CEPS-P (Physician)

For Core Sections 1 – 3, refer to pages 17-18.

4. Pediatrics Section 1	8%
4P.A. Developmental Electrophysiology	
4P.A.1. Embryology of the conduction system (in normal heart, in congenital heart disease)	
4P.A.2. Development of electrophysiology	
4P.A.2.a. Depolarizing currents	
4P.A.2.b. Autonomic nervous system effects on the cardiac con duction system	
4P.A.2.c. Electrophysiological properties and substrates of arrhythmias	
4P.A.3. Pharmacokinetic and pharmacodynamic of antiarrhythmic drugs	
4P.A.3.a. From fetus to adolescent	
4P.A.3.b. Breast milk feeding	
4P.A.3.c. In adults with congenital heart disease	
4P.B.4. Biophysics in children	
4P.A.4.a. Radiofrequency energy delivery in growing hearts	
4P.A.4.b. Cardioversion and defibrillation energy through physi cal maturation	
4P.A.4.c. Cryophysics in children	
4P.B. Electrophysiology of Congenital Heart Disease	
4P.B.1. Congenital substrates of arrhythmias (e.g. Anatomy of conduc tion system in L-TGA, AV canal, TOF/VSD; Association of WPW with specific CHD; Concept of twin AV nodes in heterotaxy)	
4P.B.2. Etiology of AV block and congenital heart disease (genetic factors)	
4P.B.3. Acquired substrates of arrhythmia	
4P.B.3.a. Hemodynamic effect of congenital heart disease on arrhythmia	
4P.B.3.b. Surgical factors	
4P.B.3.c. Comorbid condition (e.g., endocrine hypertension, obesity)	

5. Pediatrics Section 2	15%
5P.A. Clinical Management of Pediatric Electrophysiology	
5P.A.1. Fetal arrhythmias	
5P.A.2. Newborn arrhythmias	
5P.A.3. Ventricular arrhythmias in the structurally normal heart	
5P.A.4. Inherited arrhythmia syndromes, channelopathies	
5P.A.4.a. Proband assessment	
5P.A.4.b. Family screening	
5P.A.4.c. Lifestyle implications	
5P.A.5. Arrhythmias in CHD and post-CHD surgery	
5P.A.6. Sudden death risk assessment in children	
5P.A.7. Arrhythmias associated with non-cardiac conditions affecting children (e.g., chagas disease, rheumatic heart disease)	
5P.B. Invasive Electrophysiologic Testing in Children	
5P.B.1. Sedation and anesthesia	
5P.B.2. Procedural indications and contraindications	
5P.B.3. Procedural considerations regarding vascular and cardiac ac cess of catheters	
5P.B.4. EP testing, mapping and ablation strategies	
5P.B.4.a. In the structurally normal heart	
5P.B.4.b. In the congenital heart disease (e.g., Twin nodal SVT, Accessory pathways associated with CHD)	
5P.B.4.c. Post-surgical CHD (e.g., Scar-related IART, Scar-relat ed FAT, Scar-related VT)	
5P.B.5. Surgical ablation in congenital heart disease	

6. Pediatrics Section 3	6%
6P.A. Implantable Devices in Children and Adults with Congenital Heart Disease	
6P.A.1. Indications and contraindications for implantation	
6P.A.2. Strategies for hardware placement	
6P.A.2.a. In children with limited access	
6P.A.2.b. In congenital heart defects	
6P.A.3. Recognition and management of device and lead complications for epicardial and endocardial systems	
6P.A.4. Lead extraction/lead burden issues in pediatrics	
6P.A.5. Lifestyle issues and psychological effects of device implantation and device malfunction in children	
6P.A.6. Ancillary testing to optimize device programming	
6P.A.7. Device monitoring	

Item 13: Exam Content Outline: CDRMS (Allied Professional)

1. Rhythm Recognition	38%
1.A. Rhythm strip	11%
1.A.1. Atrial fibrillation/Atrial flutter	1%
1.A.1.a. Bradycardia-tachycardia	
1.A.1.b. Rapid ventricular response	
1.A.2. Ventricular tachycardias	2%
1.A.2.a. Polymorphic	
1.A.2.b. Monomorphic	
1.A.2.c. Torsades de pointes	
1.A.2.d. Nonsustained	
1.A.2.e. Sustained	
1.A.3. Supraventricular tachycardias	1%
1.A.3.a. Atrial tachycardia	
3.A.3.b. Reentrant atrial tachycardia	
1.A.4. Sinus tachycardia	1%
1.A.5. AV block	2%
1.A.5.a. Mobitz I	
1.A.5.b. Mobitz 2	
1.A.5.c. Complete	
1.A.6. Normal sinus, junctional, aberrancy, PVC, PAC	1%
1.A.7. Sinus arrhythmia	1%
1.A.7.a. Sinus pause/arrest	
1.A.7.b. Nocturnal pause	
1.A.8. VA conduction	1%
1.A.9. Artifacts	1%
1.A.9.a. EMI	
1.A.9.b. Undersensing	
1.A.9.c. Oversensing	
1.A.9.d. Myopotentials	
1.B. Intracardiac EGM/ILR recordings	26%
1.B.1. Atrial fibrillation Atrial flutter	2%
1.B.2. Ventricular tachycardias	4%
1.B.2.a. Polymorphic	
1.B.2.b. Monomorphic	
1.B.2.c. Torsades de pointes	
1.B.2.d. Nonsustained	
1.B.2.e. Sustained	
1.B.2.f. 1:1 VA conduction	
1.B.2.g. Dual tachycardia	

1. **Rhythm Recognition** (Continued)	
1.B.3. Far-field electrogram	**1%**
1.B.4. Supraventricular tachycardias	**3%**
1.B.4.a. Atrial tachycardia	
1.B.4.b. AV node reentrant tachycardia	
1.B.4.c. Long R-P tachycardia	
1.B.5. Sinus tachycardia	**2%**
1.B.6. AV block	**2%**
1.B.6.a. Mobitz I	
1.B.6.b. Mobitz 2	
1.B.6.c. Complete	
1.B.7. Normal sinus, sinus arrhythmia, junctional, aberrancy, PVC, PAC	**3%**
1.B.8. Sinus arrhythmia	**1%**
1.B.8.a. Sinus pause/arrest	
1.B.8.b. Nocturnal pause	
1.B.9. VA conduction	**1%**
1.B.10. Artifacts	**3%**
1.B.10.a. EMI	
1.B.10.b. Undersensing	
1.B.10.c. Oversensing	
1.B.10.d. Myopotentials	
1.B.11. Triggered ventricular pacing	**1%**
1.B.12. T-wave oversensing	**1%**
1.B.13. Pacemaker-mediated tachycardia; VA conduction	**2%**
1.C. 12-lead	**1%**
1.C.1. Bundle branch block	
1.C.2. CRT pacing	
1.C.3. AV block	
1.C.4. Preexcitation	
1.C.5. His bundle pacing	

2. Device & Lead Function	28%
2.A. Timing cycles and modes	7%
2.A.1. PVARP	
2.A.2. Blanking period	
2.A.3. Safety pacing	
2.A.4. Mode recognition	
2.A.5. CRT timing	
2.A.6. Synch AV, adaptive bi-V	
2.A.7. Upper rate behavior	
2.A.8. AV hysteresis	
2.A.9. Rate hysteresis	
2.A.10. Minimized RV pacing algorithms	
2.A.11. Fusion	
2.A.12. Pseudofusion/pseudopseudofusion	
2.B. Malfunction	12%
2.B.1. Loss of capture	2%
2.B.1.a. Physiologic	
2.B.1.b. Nonphysiologic	
2.B.1.c. Capture management	
2.B.2. Lead failure	4%
2.B.2.a. Fracture	
2.B.2.b. Physiologic threshold increase	
2.B.2.c. Insulation failure	
2.B.2.d. Polarity/lead safety switch	
2.B.2.e. High-voltage/low-voltage	
2.B.3. Undersensing	2%
2.B.3.a. Inappropriate tracking	
2.B.3.b. Physiologic loss of capture (atrial, ventricular)	
2.B.4. Oversensing	4%
2.B.4.a. Far-field	
2.B.4.b. EMI	
2.B.4.c. Myopotentials	
2.B.4.d. T-wave	
2.B.4.e. Inappropriate mode switching	
2.B.4.f. Lead integrity alert	
2.B.4.g. Loose set screw	
2.C. ICD-Specific Function	9%
2.C.1. Detection/discrimination	4%
2.C.1.a. Sudden onset	
2.C.1.b. Rate stability	
2.C.1.c. Morphology/wavelet	
2.C.1.d. 1:1 VA association	
2.C.1.e. PR relationship	

2. Device & Lead Function (Continued)	
2.C.1.f. Detection zones	
2.C.1.g. High-rate timeout	
2.C.1.h. Aborted shocks/redetection	
2.C.1.i. Detection duration	
2.C.1.j. Subcutaneous ICD	
2.C.2. Tachycardia therapies	**5%**
2.C.2.a. Shock therapy (effective/ineffective, DFT)	
2.C.2.b. ATP algorithms (burst, ramp, etc.)	
2.C.2.c. Failure to detect	
2.C.2.d. Dynamic therapy	

3. Remote Service Management	14%
3.A. Connectivity	**2%**
3.A.1. Manual vs automatic	
3.A.2. Troubleshooting	
3.B. Alert management	**7%**
3.B.1. Diagnosis-based alert settings	
3.B.2. Actionable device/lead issues	
3.B.3. Actionable rhythm issues	
3.B.4. Tachycardia therapies disabled	
3.C. Battery follow-up management	**3%**
3.C.1. ERI/recommended replacement time (RRT)	
3.C.2. EOL	
3.C.3. Transmission interval	
3.C.4. Capacitor reform time	
3.C.5. Battery voltage curve	
3.D. Advisory follow-up management	**2%**
3.D.1. Boston minute ventilation oversensing	
3.D.2. St. Jude battery depletion	
3.D.3. Boston low-voltage capacitor failure	

4. Diagnostic Monitoring	14%
4.A. Heart failure	**4%**
4.A.1. Chest wall impedance monitoring	
4.A.2. Heart Logic (generic name TBD)	
4.A.3. LV pacing percentage	
4.B. Rhythm & rate monitoring	**10%**
4.B.1. Graph interpretation	
4.B.2. Atrial fibrillation/oral anti-coagulation	
4.B.3. Duration of monitoring statistics	
4.B.4. Histogram/Cardiac Compass (generic TBD) interpretation	
4.B.5. Atrial fibrillation/rapid response	
4.B.6. Ventricular tachyarrhythmias	
4.B.7. Change in pacing percentage	
4.B.8. Management of symptomatic episodes	

5. Device Technology	6%
5.A. Rate response sensors	**2%**
5.A.1. Activity	
5.A.2. Minute ventilation	
5.A.3. Closed loop stimulation	
5.B. Basic Electronic & Energy Concepts	**4%**
5.B.1. Ohm's Law	
5.B.2. Strength duration curve	
5.B.3. Battery impedance	
5.B.4. Shocking vectors	
5.B.5. Pacing polarities (LV vectors, high-voltage leads, brady leads)	
5.B.6. Magnet effects	
5.B.7. MRI safe modes	
TOTALS	**100%**

SECTION IV: Candidate Information

Item 1: Understanding the Certification Process

Certification by IBHRE is widely recognized by physicians, allied professionals, healthcare institutions, government health ministries, and patients as determining criteria that a cardiac arrhythmia management professional has the knowledge, experience and skills to provide quality specialty health care. It is considered the gold standard because of its unique approach for assessing competency in cardiac rhythm device therapy for the practicing physician and allied professional. The process for initial certification involves a rigorous examination designed by specialists in the field. Successful candidates are awarded certification. See IBHRE's Qualifications, Suspensions and Revocation Policy for more information.

Item 2: Exam Dates & Registration Deadlines

Exam dates and registration deadlines are subject to change and are regularly updated on the IBHRE website at IBHRE.org/calendar. It is the responsibility of the candidate to be aware of and comply with registration deadlines. In fairness to all candidates, IBHRE adheres firmly to its published registration deadlines for its examinations. Late applications will not be accepted; there are no exceptions. Candidates are encouraged to apply early.

Item 3: Verification of Eligibility

IBHRE reserves the right to independently verify the licenses, credentials and employment status of all examination candidates. The candidate's signature on his or her examination application duly authorizes IBHRE to conduct such independent verification. IBHRE does not, under any circumstances, determine a candidate's eligibility for the exams based on affiliation or membership with any particular organization(s). Members of the Heart Rhythm Society are benefited only through discounted exam fees and are not granted special consideration when determining eligibility.

Item 4: Eligibility Requirements and Documentation

Allied Professional CCDS Exam Eligibility Policy

The purpose of this policy is to articulate and define the standard eligibility requirement to qualify for IBHRE certification exams and the documentation required from candidates to prove eligibility.

Criteria:

Applicants for the Cardiac Rhythm Device Therapy Examination for the Allied Professional must demonstrate that they are actively involved in the practice of heart rhythm management and that they have:

- Successfully completed a formal comprehensive training program in cardiac pacing and/or electrophysiology that facilitates a minimum of 6 months didactic training and 6 months exposure to the field.

OR

- Successfully completed the Registered Cardiac Electrophysiology Specialist (RCES) or Registered Cardiovascular Invasive Specialist (RCIS) examinations through Cardiovascular Credentialing International (CCI), or an equivalent examination, and a minimum of 12 months of clinical experience in cardiac pacing and/or electrophysiology with direct exposure to patient cases.

OR

- Have a minimum of two years of experience or 100 cases in the technical setting or in the field of cardiac pacing and/or electrophysiology with direct exposure to patient cases in the clinical or industry setting.

Required Documentation:

Upon submitting an application for the exam, all candidates must provide appropriate documentation as evidence of the candidate's eligibility:

- At least one letter of recommendation from an immediate supervisor, physician supervisor, or colleague from the candidate's place of employment attesting to candidate's current position and field of cardiac rhythm management. In addition, the same letter or another letter must confirm current or past involvement in the field of cardiac rhythm management (Cardiac Pacing, Electrophysiology, or Cardioversion Defibrillation), years of experience in the field, and the necessary exposure to cardiac rhythm management. Note: Letter(s) must be on official letterhead.

- Certificate of completion or other documentation verifying successful completion of a formal comprehensive training program or certification (such as the Registered Cardiac Electrophysiology Specialist or Registered Cardiovascular Invasive Specialist) in cardiac pacing and/or electrophysiology.

- Training programs for allied professional applicants may include but are not limited to the following examples: Arrhythmia Technologies Institute, PrepMD, and Cardiac Electrophysiology Institute of Australia. Completing training programs does not guarantee successful completion of IBHRE's certification exams. For additional examples of acceptable training programs, contact IBHRE.

Allied Professional CEPS Exam Eligibility Policy

The purpose of this policy is to articulate and define the standard eligibility requirement held by the IBHRE in order to qualify for the CEPS certification exams and the documentation required from candidates in order to prove eligibility.

Criteria:

Applicants for the Cardiac Electrophysiology Examination for the Allied Professional must demonstrate that they are involved in the practice of heart rhythm management and that they have:

- A minimum of two years of experience in the field of cardiac electrophysiology (with or without cardiac device therapy experience) through direct exposure to patient cases in the clinical or industry setting or exposure to technical cases in the industry setting.

OR

- Successfully completed a formal comprehensive training program in cardiac pacing or electrophysiology that facilitates a minimum of six months didactic training and exposure to the field. Additionally, allied professional applicants for the Cardiac Electrophysiology Examination must have a minimum of six months of involvement in the field of electrophysiology with direct exposure to patient cases in the clinical or industry setting or exposure to technical cases in the industry setting.

OR

- Successfully completed the Registered Cardiac Electrophysiology Specialist (RCES) examinations through Cardiovascular Credentialing International (CCI), or an equivalent examination, and a minimum of 12 months of clinical experience in cardiac electrophysiology (including a component of cardiac device therapy experience or exposure).

Required Documentation:

Upon submitting an application for the exam, all candidates must provide appropriate documentation as evidence of the candidate's eligibility:

- At least one letter of recommendation from an immediate supervisor, physician supervisor, or colleague from the candidate's place of employment attesting to the candidate's current position (letter must be printed on company letterhead). In addition, the same letter or another letter must confirm current or past involvement in the field of cardiac rhythm management (Cardiac Pacing, Electrophysiology, or Cardioversion Defibrillation), years of experience in the field (must total a minimum of two years), and the necessary exposure to patient cases (refer to IBHRE's eligibility requirements)

- Certificate of completion or other documentation verifying successful completion of a formal comprehensive training program or certification (such as Registered Cardiac Electrophysiology Specialist) in electrophysiology or cardiac device therapy

- Training programs for allied professional applicants may include but are not limited to the following examples: Arrhythmia Technologies Institute, PrepMD, and Cardiac Electrophysiology Institute of Australia. Completing training programs does not successful completion of IBHRE's certification exams. For additional examples of acceptable training programs, contact IBHRE.

Allied Professional CDRMS Exam Eligibility Policy

The purpose of this policy is to articulate and define the standard eligibility requirement held by IBHRE in order to qualify for the CDRMS certification exam and the documentation required from candidates in order to prove eligibility.

Criteria:

Applicants for the CDRMS certification examination must demonstrate that they meet the following eligibility criteria as it applies to cardiac implantable electronic device (CIED) remote monitoring. The required experience as noted below may be obtained by performing remote monitoring, or in-person evaluations. This includes exposure to pacemakers, implantable cardioverter defibrillators, and subcutaneous cardiac rhythm monitoring devices (aka. implantable loop recorder). Exposure to all major manufacturer's devices is highly encouraged. Note that persons who already hold a valid Certified Cardiac Device Specialist (CCDS) credential are not encouraged to sit for this examination, as the CCDS credential is a higher-level certification.

1. A minimum of an Associate Degree in a medical field with at least one year of CIED remote monitoring or in-person evaluations

OR

2. A minimum of two years of experience with CIED remote monitoring or in-person evaluation

OR

3. Successfully completed the Registered Cardiac Electrophysiology Specialist (RCES) or Registered Cardiovascular Invasive Specialist (RCIS) examinations, or an equivalent examination, with at least one year of CIED remote monitoring or in-person evaluations

AND

One letter of recommendation that validates your commitment in the field submitted with the application.
Required Documentation:

Upon submitting an application for the exam, all candidates must provide appropriate documentation as evidence of their eligibility – all eligibility criteria must be addressed as part of the application by submission of documentation. All documentation must be uploaded as one file and submitted with the online application. Documentation will be reviewed by IBHRE staff. Applications received without appropriate documentation will be ineligible to sit for the examination.

Depending on the eligibility pathway, required documentation for submission are is as follows:

- At least one letter of recommendation from an immediate supervisor, physician supervisor, representative, or colleague from the candidate's place of employment attesting to the candidate's current position. In addition, the same letter or another letter must confirm current or past involvement in the field of remote or in-person CIED monitoring/management, and the number of years of experience in the field. Note: Letter(s) must be on official letterhead.

- If applicable, a copy of current professional license from the state, province or country of current practice.

- If applicable, a copy of certificate or diploma of completion from professional school (e.g. medical, nursing, technical college, bachelor's degree, etc.)

- If applicable, certificate of completion or other documentation verifying successful completion of education or certification (such as Registered Cardiac Electrophysiology Specialist or Registered Cardiovascular Invasive Specialist)

Physician CCDS Exam Eligibility Policy

The purpose of this policy is to articulate and define the standard eligibility requirement held by IBHRE to qualify for the CCDS certification exam and the documentation required from candidates to prove eligibility.

Criteria:

Each applicant for the Cardiac Rhythm Device Therapy Examination for the Physician must be a licensed physician involved in the practice of heart rhythm management. Physicians applying for the certification must also:

- Have completed a fellowship in Cardiology (adult or pediatric) or Clinical Cardiac Electrophysiology

OR

- Have documented a minimum of one year of direct, substantial involvement in the care of cardiac rhythm device therapy patients. Exposure includes a minimum of 100 device interrogations with reprogramming as needed. The devices should include pacemakers, implantable defibrillators, cardiac resynchronization devices and implantable loop recorders/cardiac monitors.

Required Documentation:

Upon submitting an application for the exam, all candidates must provide appropriate documentation as evidence of the candidate's eligibility:

- Physicians must include a copy of their current medical license from the state, province or country where they currently practice with their application.

- Physicians must include a copy of their certificate/diploma of completion of medical school and residency programs specifying dates of completion.

- Physicians must include a certificate of completion of the necessary fellowship training program or attestation from a supervisor or colleague verifying direct involvement in managing device therapy for patients for a minimum of one year (refer to IBHRE's eligibility requirements).

Physician CEPS Exam Eligibility Policy

The purpose of this policy is to articulate and define the standard eligibility requirement held by IBHRE in order to qualify for the CEPS examination and the documentation required from candidates in order to prove eligibility.

This examination is NOT available to American Board of Internal Medicine (ABIM) eligible candidates. Physicians who have had all of their training in the United States and are eligible to sit for the ABIM Internal Medicine, Cardiovascular Medicine, and Clinical Cardiac Electrophysiology Board Exams should utilize that pathway to achieve Board Certification.

Criteria:

1. Each applicant for the in Cardiac Electrophysiology Examination for the Physician must be a licensed physician with active involvement in the clinical management and care of adult or pediatric patients. Physicians may apply to sit for one of the Cardiac Electrophysiology examination:

   a. Adult Electrophysiology
   b. Pediatric Electrophysiology

2. Physicians applying for the IBHRE Board Certification Examination in Cardiac Electrophysiology must also have completed training equivalent to:

Track 1

- Graduation from an accredited medical school
- Successful completion of an internal medicine or general pediatric residency program
- Successful completion of an adult or pediatric cardiovascular medicine fellowship program
- Successful completion of a minimum of 2 years of cardiac electrophysiology training in either an adult or pediatric clinical cardiac electrophysiology fellowship program.

NOTE: If a full 2 years of clinical training is not available in the candidate's training program, candidates may satisfy the training requirement by completing 1 year of cardiac electrophysiology training (adult or pediatric) plus at least one year of clinical practice, mentored by a more senior electrophysiologist who has current certification in cardiac electrophysiology in their country of practice.

OR

Track 2

- Adult EP applicants completing training prior to the availability of authorized electrophysiology training programs (generally prior to 1995) may qualify either by satisfying Track 1 requirements, or by demon strating a minimum level of cardiac electrophysiology practice experience consisting of at least 5 years of active clinical electrophysiology involvement in the management and care of adult electrophysiology patients.

OR

Track 3

- Pediatric EP applicants completing training prior to July 1, 2005 may qualify either by satisfying Track 1 requirements above, or by demonstrating a minimum level of practice experience consisting of at least 5 years of active pediatric electrophysiology experience. The candidate must be actively involved in the management and care of pediatric arrhythmia patients.

Effective October 31, 2021, the waiver for applicants who completed training prior to 1995 and July 1, 2005 will be discontinued.

IBHRE recognizes that training pathways and practice patterns vary around the world. If it is determined that your experience and training does not fit into the above required criteria, you may notify IBHRE via email at info@ibhre.org. These applicants will receive a formal review by IBHRE leadership.

Required Documentation:

Upon submitting an application for the Certification Examination for Competency in Cardiac Electrophysiology for the Physician, all candidates must provide appropriate documentation as evidence of the candidate's eligibility:

- Physicians must include a copy of their current medical license from the state, province or country where they currently practice with their application.

- Physicians must include a certificate/diploma of completion of their respective medical school and residency programs and the dates of completion on their applications.

- Physicians must include a copy of their certificate of completion of the necessary fellowship training program or attestation from a supervisor or colleague verifying direct involvement in managing device therapy patients for a minimum of one year (refer to IBHRE's eligibility policy).

- All candidates who have completed an adult or pediatric electrophysiology training program or have substantial clinical involvement in the management and care of EP patients will be required to support their application by submission of total numbers of ablations performed, and pacemakers/ICDs implanted.

- Fellowship programs should be accredited or otherwise deem acceptable by IBHRE for the adult candidate.

- Pediatric fellowship programs should be associated with an accredited Pediatric Cardiology training program,or otherwise deem acceptable by IBHRE for the pediatric candidate.

In review of the applicant's documentation of clinical experience, along with the IBHRE Review & Appeals Committee, IBHRE will defer to the following documents (or their updated versions as they become available) to cite appropriateness of a given training experience, and/or relevant exposure and involvement in the practice of heart rhythm management:

- ACC/HRS Recommendations for Training in Adult Cardiovascular Medicine, Task Force 6 guidelines: Training in Specialized Electrophysiology, Cardiac Pacing and Arrhythmia Management, Journal of the American College of Cardiology (J Am Coll 2008, 51:374-80, January 2008

- Walsh et al. Recommendations for Advanced Fellowship Training in Clinical Pediatric and Congenital Electrophysiology, Heart Rhythm, Vol 10, No 5, May 2013, Heart Rhythm Society

Item 5: Review and Appeals Policy

The purpose of the IBHRE Review and Appeals Policy is to define the process by which appeals from exam applicants, candidates and certified professionals will be addressed and reviewed. Appeals may be applied to any decision made by the IBHRE including but not limited to:

- Declined application to take an exam
- Failing score on an exam
- Denial or revocation of certification for any reason
- Action in response to a test center complaint
- Failure to meet professional development

Item 6: Exam Application Process

Exam applications are available on the IBHRE website (IBHRE.org) during the scheduled registration period. Candidates must submit their applications with payment to IBHRE during the registration period to be considered for the exam.

No application will be considered without complete information and full payment.

Applications must be submitted online. However, PDF versions of the application are only available upon request. Paper applications may be submitted by e-mail, fax or mail and must be accompanied by payment at the time of submission. Clear photocopies of the application will be accepted. All information requested on the application form is required.

Applications found to be incomplete will not be approved. Incomplete applications may consist of the following:

- Missing documentation of eligibility
- Incorrect or unpaid exam fees
- Failure to validate application by signature
- Failure to complete questions pertaining to education and training, clinical experience or present involvement in the field
- Inadequate inclusion of appropriate contact information

Candidates are asked to provide at least two points of contact where they may be reached if there are questions regarding their application. Candidates should denote on their application which address and e-mail they prefer to be contacted by IBHRE.

Complete applications must be received by the deadline date regardless of the method used to apply. Exam applications will be reviewed in the order in which they are received. If accepted, candidates will receive a confirmation notice via e-mail confirming their approval to take the exam within four weeks of submitting their application. This notice will only confirm approval and does not allow the candidate to schedule their test appointment. Emailed instructions to take the computer-based examination will be distributed four to six weeks following the close of registration.

Candidates are responsible for informing IBHRE with changes to their email address.

Activity Requirements

It is the goal and objective of this policy to uphold the standards and policies of IBHRE with respect to applicants, exam candidates, and certified professionals, and to provide such persons with fair and objective due process in the event they disagree with decisions made by IBHRE.

Applicants, exam candidates, and certified professionals are entitled within 45 days after receipt of a decision by IBHRE with which they disagree to file a written request for appeal. Requests to activate the review process must be sent in writing to:

Chief Executive Officer
IBHRE
1325 G Street NW, Ste 400
Washington, DC 20005

The claim shall be forwarded to the Review & Appeals Committee for the appeals process. Appeal requests are subject to a $150 fee.

Item 7: Challenges Fulfilling Certification Requirements

Please visit IBHRE's Policies page for more information.

Item 8: Fees & Submission of Payment

IBHRE will provide a discount to EP fellows who take the IBHRE exam within one year of completing their fellowship training. Please see current exam fees below:

Exam Fees

2024 CCDS Exam	Physician	
	Member	Non-Member
First-time, Early	$1350	$1550
First-time, Standard	$1480	$1830
Re-take/Recert, Early	$1220	$1410
Re-take/Recert, Standard	$1350	$1660

2024 CCDS Exam	Allied Professional	
	Member	Non-Member
First-time, Early	$1230	$1410
First-time, Standard	$1340	$1510
Re-take/Recert, Early	$1085	$1310
Re-take/Recert, Standard	$1210	$1350

2024 CEPS Exam	Allied Professional	
	Member	Non-Member
First-time, Early	$980	$1140
First-time, Standard	$1085	$1199
Re-take/Recert, Early	$885	$1040
Re-take/Recert, Standard	$990	$1090

2024 CDRMS Exam	Allied Professional	
	Member	Non-Member
First-time, Early	$730	$750
First-time, Standard	$799	$825
Re-take, Early	$700	$720
Re-take, Standard	$780	$790

Member fees apply only to Heart Rhythm Society members who are in good standing at the time their exam applications are submitted. IBHRE will not issue refunds to anyone whose membership is processed following the date of exam registration. Membership applications should be submitted at least two weeks prior to the exam applications to allow time for processing. For more registration information about Society membership, please visit HRSOnline.org/Membership.

Applicants must pay all fees or charges connected with the examination at the time of registration. IBHRE accepts the following credit cards: American Express, VISA, and MasterCard. Credit cards processed through the online application will be charged immediately. Checks must be made payable to the International Board of Heart Rhythm Examiners or IBHRE. All checks must be drawn from a U.S. bank in U.S. dollars. Applications will not be processed without full payment to IBHRE. Purchase orders are not accepted. All exam fees are subject to change.

Consult the IBHRE website for the most up-to-date fee schedule under the appropriate exam section at IBHRE.org.

Item 9: Cancellation & Refunds

Cancellation requests must be submitted in writing by the exam candidate prior to the exam date(s). An $85 processing fee will be withheld for all cancellation requests, in addition to the cancellation fees listed below. Telephone requests will not be accepted.

Cancellations will be processed if a written request is received by IBHRE:

- 6 weeks prior to the exam date(s) – fees will be refunded less $325
- 4 weeks prior to the exam date(s) – fees will be refunded less $525
- 2 weeks prior to the exam date(s) and “no shows” on exam date – No refund

Refunds will only be issued upon cancellation of exam registration. Requests from third parties to cancel or transfer a candidate’s registration will not be honored. Third parties who submit payment on behalf of an exam candidate should be aware that they do so voluntarily, at their own risk, and will not be recognized as party to the agreement made between the exam candidate and IBHRE through submission of their application. All refunds will be issued directly to the party initially responsible for remitting payment. All exam registrations are nontransferable.

Applicants who do not meet the eligibility requirements for the exam will be refunded the full amount less an $85 processing fee.

Item 10: Computer-Based Testing Centers

IBHRE computer-based examinations are administered in more than 65 countries once per year at PSI testing centers. PSI testing centers are available in almost every major metropolitan area in North America. Candidates outside of North America may need to travel outside of their country to access the closest testing center. Candidates are responsible for scheduling their own testing appointment. An up-to-date list of testing centers is available at https://test-takers.psiexams.com/ibhre.

COVID-19 Safety Protocol at PSI Testing Sites. To ensure the safety of our exam candidates, IBHRE’s testing partner, PSI, adheres to COVID-19 guidelines provided by the US Centers for Disease Control & Prevention (CDC) and the World Health Organization (WHO) as well as local social distancing ordinances where they operate test centers. Please click here regarding PSI COVID-19 information: https://www.psiexams.com/test-takers/support/covid-notice/ and click here regarding Weather closures: https://www.psiexams.com/test-takers/openings/.

Item 11: Scheduling Exam Appointments

You will receive an email from PSI with your eligibility and will login with your IBHRE Username and password. For the fastest and most convenient test scheduling process, PSI recommends that candidates register for their exams using the Internet. Candidates register online by accessing PSI's registration website at https://test-takers.psiexams.com/ibhre. Internet registration is closes 14 days before the exam

You will receive a confirmation email, which includes important information about your examination appointment. Retain a copy of your confirmation email for your records.

Scheduling Online

To schedule online, you must provide a valid e-mail address and phone number. This information is necessary for PSI to email a confirmation notice and to contact you if your appointment must be rescheduled.

Candidates are responsible for scheduling their own exam appointments at a PSI testing center near them. Exam appointments are scheduled PSI on a first-come, first-served basis and no exam appointments can be requested within two business days of exam day. Candidates are strongly urged to schedule their appointments at least 30 days prior to the exam. Candidates should contact IBHRE if they experience any difficulty scheduling an appointment or if they do not receive emailed scheduling instructions within eight weeks following the registration deadline.

While IBHRE will make every effort possible to assist candidates with scheduling a testing appointment at their preferred test center, candidates should be aware that IBHRE and PSI cannot guarantee all test centers to be available on the designated exam date. Candidates are encouraged to select second-choice test centers in the event their first choice is unavailable when scheduling an appointment. Candidates who require special accommodations must notify IBHRE at least three weeks prior to their scheduled exam. All cancellation and refund policies apply to candidates who fail to schedule their appointments in a timely manner.

Candidates who wish to change exam sites within the same country or region where they are registered may do so by contacting PSI at 1-833-333-4754 **at least two business days before** the exam date. Candidates are required to provide their PSI confirmation numbers when rescheduling. If less than two business days' notice is provided, PSI will charge a fee to reschedule the appointment at the alternate location.

Item 12: Requesting Special Accommodations

IBHRE and PSI will provide reasonable accommodations for test candidates with disabilities that are covered under the Americans with Disabilities Act (ADA). The ADA defines a person with a disability as someone with a major physical or mental impairment that substantially limits one or more major life activities (e.g., walking, sitting, standing, seeing, hearing, speaking, breathing, learning, working, caring for oneself and performing manual tasks).

For requesting special Accommodations go to: PSI Candidate Services for Special Accommodations - use the Candidate Zendesk Link: https://psi-cdexp.zendesk.com/hc/en-us/requests/new?ticket_form_id=360000150872 com.

The documentation must:

- Be current (completed within the last three years)
- Clearly state the diagnosed disability or disabilities
- Describe the functional limitations resulting from the disability
- Describe the specific accommodations requested and the rationale for such accommodations
- Be typed or printed on official letterhead and signed by the evaluator qualified to make the diagnosis

The purpose of the documentation is to validate that the candidate is covered under the ADA as a disabled individual. Additional documentation may be required to support the request. All documentation submitted in support of a request for special accommodation will be kept confidential; IBHRE will only use the documentation for determination of special testing arrangements and will not disclose the documentation to other individuals. Based on the scope of reasonable accommodation, there may be an additional charge to the candidate for making these special arrangements. Candidates who apply online must mail or fax or email special accommodations documentation within five business days of the date the online application is submitted.

Candidates approved for test accommodations will receive emailed scheduling instructions and then must contact PSI Candidate Services for Special Accommodations - Phone: +1 800-367-1565 x6750. Local centers may not schedule appointments for candidates requiring testing accommodations.

SECTION V: Exam Resources

Item 1: Exam Resources Disclaimer

Exam candidates should be aware that the IBHRE exams are not written according to any single textbook. The reading lists and resources that are referenced below are recommended guides for IBHRE exam candidates. The list of recommended resources promoted by IBHRE in this Handbook is not exclusive and should not be interpreted as a guaranteed means of passing the exam. There is no guarantee that the answers to all IBHRE exam questions will be found within these references. It is also possible that the references listed may have perceptions that differ from those of IBHRE. For purposes of the examination, the IBHRE interpretation will prevail.

IBHRE does not recommend any one course of study or means of preparing for the exam over another. Independent organizations that sponsor review courses for the purpose of preparing candidates for the IBHRE exams are free to do so, as long as the IBHRE name and licensed marks are not misrepresented.

Item 2: Exam Resources and Study Tips

IBHRE offers the following tips to candidates planning to take any of the IBHRE certification exams:

- Refer to your experience in the field, drawing from on-the-job training and clinical experience in implant procedures and EP studies.
- Consult at least one textbook on general pacing/defibrillation or electrophysiology and a variety of review articles and reports on major clinical trials.
- Review the IBHRE recommended reading lists as a reference of pertinent texts.
- Seek out articles concerning arrhythmias (particularly review articles) in major cardiology and electrophysiology journals.
- Review the Exam Content Outline for a comprehensive list of the content that will appear on the exam. The Outline includes the percentage of the exam each content area will cover.
- Take the Computer-Based Testing Tutorial prior to exam day to become familiar with the exam format.

Item 3: Recommended Reading Lists

Recommended publications can be found on IBHRE's website. These lists may prove useful for the purpose of exam preparation. IBHRE does not imply that all publications should be consulted in preparation for the exam and familiarity with any or all of the material does not guarantee successful completion of the exam. These resources are subject to change; for an up-to-date list of recommended publications, IBHRE encourages you to visit https://ibhre.org/exam-resources/reading-lists.

Item 4: Computer-Based Testing Tutorials

IBHRE computer-based testing tutorials illustrate how the computerized test works and provides exam candidates with an opportunity to become comfortable with the new format before taking the exam. The tutorial will also be available to candidates on exam day. Candidates will be given an opportunity to complete the tutorial prior to taking the exam. This time is offered in addition to the time allotted for the actual exam.

Free downloadable versions of the Computer- Based Testing Tutorials can be accessed at https://ibhre.org/exam-resources/computer-based-testing-tutorials. Exam candidates are welcome to download the tutorial to their computers to become familiar with the exam format.

Personal computers should meet the following system and software requirements in order to successfully download the tutorials for the CCDS Exam, the CEPS (Allied Professional) Exam, and the CDRMS Exam. Please note that these system requirements are not needed for the CEPS–Adult or CEPS–Pediatric (Physician) Tutorials.

- Windows® 98, 2000, or XP with administrator privileges where applicable
- Intel® Pentium® or higher processor recommended
- 733 MHz or higher
- 128 MB RAM or higher
- 100 MB available on the hard drive
- Mouse
- Color display set to 24-Bit or True Color
- 1025 x 768 screen resolution is recommended
- Not compatible with Mac computers

Item 5: Online Information Resources

The IBHRE website includes additional and more extensive information regarding the exam resources listed above. Exam candidates should visit IBHRE.org and click on Resources for more information.

SECTION VI: Exam Day

Item 1: What to Bring

On the day of the exam, candidates should plan to arrive at their testing center 30 minutes prior to their scheduled appointment. If you are more than 30 minutes late for your appointment, you will not be permitted to test. Upon arrival, candidates must present a valid government- issued ID that includes both a signature and a recent photograph.

Acceptable forms of identification include:

- Passport
- Driver's License
- Citizenship card
- State ID card
- Military ID

A Social Security card is NOT an acceptable form of ID for checking in at the test center.

The first and last name on the photo-bearing ID must be exactly the same as the first and last name on the PSI confirmation email. Candidates whose ID names do not match the name on the scheduling information will not be permitted to test. Candidates are reminded to check upon receipt for accuracy and to contact IBHRE if the names do not match.

Candidates who are not permitted to test due to invalid or expired ID will forfeit all exam fees, and must reapply and pay the full exam fee in order to test during a subsequent interval.

Upon arrival at the test center, candidates must present the required identification, sign a test center log, be photographed and store personal belongings in a small assigned locker.

Scratch paper and pencil are not allowed. Online calculator and caliper functions may be provided as determined by IBHRE test writing committees.

Test center staff will escort candidates to their assigned testing station and provide brief instructions on use of the computer equipment.

Item 2: Exam Appointment

Each exam candidate is allotted up to 5 hours for the entire exam session depending upon the exam – refer to the FAQs posted at IBHRE.org and your scheduling confirmation for your specific appointment time.

Examinees are given an optional Computer-Based Testing (CBT) tutorial prior to the exam. For your convenience, break time is also scheduled. All examinees can review past questions but may not return to a section once it is complete.

All examinees are encouraged to take the introductory tutorial. A test center administrator is available to answer questions about using the computer.

For more information about break times, please see the following chart:

Exam Name	Exam Duration	Exam Breaks	Exam Items
Cardiac Device Remote Monitoring Specialist (CDRMS)	210 minutes	Sections = 2, one break total 5-minute break between sections	150
Sections = 2, one break total 5-minute break between sections	240 minutes	Sections = 4, three breaks total, 5-minute break between sections	200
Certified Cardiac Device Specialist (CCDS)	240 minutes	Sections = 4, three breaks total, 5-minute break between sections	200
Certified Electrophysiology Specialist - Adult (CEPS-A)	240 minutes	Sections = 4, three breaks total, 5-minute break between sections	175
Certified Electrophysiology Specialist - Pediatric (CEPS-P)	240 minutes	Sections = 4, three breaks total, 5-minute break between sections	175

Item 3: Exam Time

Examinees should monitor the timer during their exam session. When a section timer runs out, examinees will not be able to move to any new screens within that section. The computer will close the section. After the test concludes, examinees may be asked to complete a survey about their testing experience.

IMPORTANT NOTE: Following completion of each section, you may not return to a previous section. There is a hard time-limit allotted to each section.

Item 4: Test Center Regulations

All candidates must abide by the rules and regulations of the computer-based testing center. Examinees suspected of noncompliance or cheating behavior will be reported to IBHRE. IBHRE and PSI will work together to thoroughly investigate any reports of irregularities at a test center, and IBHRE holds the authority to cancel any score(s) resulting from an irregularity.

The test center rules and regulations include:

- No study aids (e.g., textbooks, notebooks, calculators, notes are allowed anywhere in the testing center.
- No papers, books, food, drinks, pens, pencils, wallets, cell phones, beepers/pagers, electronic devices, purses, or other personal belongings are allowed in the computer-based testing room.
- Candidates must enter the testing room immediately after having their identification checked. Candidates should use the restroom before checking in.
- Candidates may not leave the testing room without the test administrator's permission. Time lost by candidates who leave the testing room will be counted toward their total test time.
- Candidates must present photo ID each time they enter the testing room.
- Candidates must sign in and out each time they enter or leave the testing room.
- Unauthorized scratch paper may not be brought into the testing room.
- Eating (including gum, candy, etc.), drinking, or use of tobacco is not allowed in the testing room.
- Personal items must be stored in a designated locker outside of the secure testing area. Keep in mind that storage facilities are small and all stored mechanical or electronic devices must be turned off. Personal items and their contents may be subject to inspection. Neither IBHRE nor PSI bear any responsibility for items left outside the testing room. Visitors are not permitted at test centers.
- Examinees may bring soft-foam earplugs into the testing room. However, they must be out of the packaging and ready for inspection by test center staff during check-in. Earplugs must be left at the workstation during all breaks. Noise-blocking headphones are available upon request from the PSI test center.
- A supervisor may dismiss candidates from the test for any of the following reasons: creating a disturbance, giving or receiving help on the test, attempting to remove test materials or notes from the test room, impersonating another candidate or failing to follow testing procedures and instructions.

Item 5: Exit Survey

After completing the exam, candidates are asked to complete a brief survey that assesses the quality of customer service provided to them and the fairness and accuracy of the exam. The results of the survey provide important information for the exam scoring process and will give IBHRE necessary feedback to help improve the quality of future exam administrations. If you have any issues regarding the exam experience, please specify the issue in your survey responses as applicable. IBHRE encourages all exam candidates to take time to complete the survey.

Item 6: Exam Security

To protect the security of the tests and maintain the validity of the scores, each candidate will be asked to confirm a statement certifying that he/she is the person whose name appears on the exam, and that he/she will not copy or retain test items or transmit them in any form to anyone. Candidates are observed at all times while taking the examination. This observation will include direct observation by test center staff as well as video and audio monitoring of computer-based testing sessions.

Item 7: IBHRE Complaint Policy

Candidates with complaints or comments about test center facilities, supervision, examination content, IBHRE, or any other matter related to the testing program should complete the comment form at the test center and submit the IBHRE Complaint and Grievance Form. Please visit IBHRE's website to access IBHRE's Complaint Policy.

All correspondence must include the candidate's name and address. If the questions or comments concern a test already taken, the correspondence should include the name of the test, the date of the test, and the location of the test center; inclusion of the candidate's customer ID number is optional. IBHRE will consider each complaint and respond within a reasonable length of time.

SECTION VII: Post-Exam

Item 1: Exam Results

Exam results are available approximately 12 weeks following the test administration. IBHRE sends emailed instructions for retrieving score reports directly to the candidate. Score reports list the candidate's name, ID number, score, and a pass/fail indication. Listed under each topic heading is a keyword phrase that provides a concise description of the fact or concept assessed by an item. The keywords are grouped into content areas. These keywords are intended to identify areas of potential weakness where further study is advisable. In addition to the score report, candidates are given a score interpretation sheet, which includes a norm table that compares a candidate's score with the scores of other examinees who took the same examination.

Pass/fail results are listed by the candidates' Customer ID numbers and do not identify any candidates by name. The link to the pass/fail results are distributed to exam candidates only via e-mail. Printing or saving a copy of your official score report is highly recommended, as online access to the report expires approximately sixty (60) days after notice is received.

To protect privacy and security, official results will not be released via telephone, facsimile or e-mail. The names of candidates who receive a passing score will be posted to the IBHRE website with the year of their most recent certification. Questions regarding exam reports may be emailed to the IBHRE staff at info@ibhre.org.

Item 2: Successful Candidates

Exam candidates who receive passing scores on their exams are automatically considered IBHRE certified in that relevant area of competency. Newly-certified individuals are issued a certificate and pin displaying their new designation in recognition of their accomplishment. The names of all newly-certified specialists are added to the IBHRE.org after results have been distributed.

Item 3: Certificates

Each candidate who receives a passing score will receive instructions for retrieving a personalized certificate verifying their certification. IBHRE will use the name of the candidate as it appears on his or her application when printing the certificate. There is a $15 fee for issuance of duplicate or replacement certificates.

Item 4: Certification Pins

Upon passing the exam, certified professionals are issued pins in recognition of their new designation. IBHRE will issue only one pin per certified professional free of charge. Replacement pins may be issued for a $10 fee.

Item 5: Retaking the Exam

All IBHRE examination candidates receive official communication according to the name that appears on their application. Candidates may use the keyword feedback in their official score report to determine areas for further study. Candidates who wish to retake the examination must submit a new application and exam fee by the application deadline for each subsequent exam. Discounted exam fees are available for candidates who choose to retake the exam.

Item 6: Name Change Requests

All IBHRE examination candidates receive official notices and scheduling instructions to the name that appears on their application. In the event a candidate must request an update to their scheduling record to reflect the name on their government-issued ID, the candidate's name as it appears in the IBHRE database will not change.

IBHRE will only make permanent changes to an exam candidate's name under the following circumstances:

- Significant error in the spelling or display of the candidate's name is cited in the database;
- Candidate reports a recent change in name due to marriage or divorce prior to the exam date; or
- Candidate indicates that their name has changed on an exam application when recertifying or retaking the exam.

Upon certification, certificates are issued using the candidate's name as it appears on their application.
Requests for changes to the name on all certificates will not be honored unless the name is misspelled.

SECTION VIII: IBHRE Certification

Item 1: IBHRE Ethics Policy

The purpose of the Code of Ethics for IBHRE Certified Professionals policy is to communicate IBHRE's expectations regarding the ethical behavior of its certified professionals. This policy contains standards of conduct and ethical behavior for professionals in the field of cardiac pacing and cardiac electrophysiology, examples of unethical behavior and potential sanctions to be enforced by the IBHRE governing body in the event an exam candidate or certified professional is found guilty of unethical or illegal behavior.

IBHRE Code of Ethics

The IBHRE holds all of its certified professionals working in the field of cardiac pacing and cardiac electrophysiology to the following responsibilities:

A. Uphold the values, ethics and mission of the profession and IBHRE
B. Conduct all personal and professional activities with honesty, integrity, respect, fairness, good faith and competence in a manner that will reflect well on the profession and IBHRE
C. Comply with all laws and regulations of the jurisdictions in which the professional conducts his/her activities
D. Maintain competence and proficiency in their profession by undertaking a personal program of assessment and continuing professional education
E. Respect professional confidences and comply with all laws pertaining to patient confidentiality and disclosure
F. Enhance the dignity and image of the profession and IBHRE through positive personal actions
G. Be truthful, candid and compassionate in all professional communications with patients and others in the practice of cardiac pacing and electrophysiology and avoid information that is false, misleading, inflammatory and deceptive, or information that would create unreasonable expectations

IBHRE endorses and hereby incorporates by reference the Code of Ethics of the Heart Rhythm Society, as relevant to certified professionals and their practices and activities in the fields of pacing and electrophysiology. The Code of Ethics of the Heart Rhythm Society can be found at www.HRSonline.org.

Ethical Behavior of Volunteer Leaders & Staff

IBHRE holds all of its stakeholders, most particularly volunteers, staff, contractors and other agents representing IBHRE to the following responsibilities:

A. Act only within the scope of authority as specified in the bylaws and written policies of IBHRE
B. Make only commitments that an individual is authorized to make or that IBHRE can make without violating established practices and policies
C. Avoid the exploitation of professional relationships or positions in the organization, whether elected or appointed, for personal gain
D. Respect professional confidences and protect the confidentiality of IBHRE information, including intellectual property, candidate identities, score results information, personnel information and other information as articulated in the IBHRE Confidentiality Policy
E. Refrain from using association with IBHRE to promote or endorse external products or services
F. Accept no gifts or benefits offered with the expectation of influencing a decision when conducting business on behalf of the organization

Cause for Sanctions from IBHRE

IBHRE may issue sanctions in the event an exam candidate or certified professional:

- Is found to have falsified or misrepresented any personal or demographic information provided on an exam application or otherwise requested by IBHRE
- Misrepresents or misuses an IBHRE credential
- Is found and proven guilty of cheating on an IBHRE certification examination
- Is found and proven guilty of assisting others to cheat on a certification examination
- Is found in possession of IBHRE examinations, test items or any other confidential and proprietary materials without direct authorization from IBHRE
- Is convicted of a crime, or has undergone limitation, sanctions, revocation, or suspension by a professional health care organization, licensing board or any other private or governmental body related to cardiac care or public health safety
- Is found guilty of gross or repeated negligence or malpractice in professional practice by a medical review board or court of law

Sanctions

IBHRE may issue sanctions that include, but are not limited to:

- Present and/or future denial of initial certification or recertification.
- Revocation of current certification credential(s) with the requirement to discontinue use of all claims to certification and to return any certificates issued by IBHRE.
- Legal action in the event the individual fails to comply with sanctions exercised by IBHRE or has perpetrated financial or other legally defensible damages against the organization.
- Monetary compensation for the costs of developing an additional form of the exam to replace the compromised form, and the amount required to re-administer a new exam (including all exams for registrants) in the event the exam was compromised (plus all legal fees).

Agreement to Confidentiality

By submitting (or having submitted) an application to take an IBHRE certification examination, exam candidates and certified professionals agree that they shall not disclose confidential information (whether oral or written in any form of media) related to, provided by or discussed during the examination or any other information identified as confidential.

IBHRE certified professionals and exam candidates should further understand that the signature provided on the exam application constitutes binding acceptance of these conditions.

Failure to comply with this confidentiality agreement may result in sanctions as articulated under Section III of this Code of Ethics and determined to be appropriate by an official review panel appointed by the IBHRE Board of Directors.

Item 2: Impartiality & Confidentiality Statement

Impartiality Statement

IBHRE and its governing body understand the significance of impartiality and the consideration of any potential conflict of interests in carrying out its management and certification activities. Through this, IBHRE signifies to certified professionals, exam candidates, and the medical community at large that the organization adheres to rigorous guidelines to maintain the integrity of its products and services. IBHRE upholds a strict impartiality policy to ensure the objectivity of our governance body and certification activities, with procedures in place to affirm that certification activities are executed with complete fairness.

IBHRE's Code of Ethics Policy and the Conflict of Interest and Disclosures process represent the standards of ethical conduct and are applied universally to all stakeholder involvement and activities. IBHRE does not condone discrimination with regard to race, color, national origin, religion, sex, age, disability, or veteran status in enrollment or employment, nor in the educational programs that it operates. IBHRE seeks to make all programs and services, including electronic and information technology, accessible to people with disabilities. In this spirit, and in accordance with the provisions of Sections 504 and 508 of the Rehabilitation Act and the Americans with Disabilities Act, the Board provides persons with reasonable accommodations to ensure equal access to the IBHRE programs and activities. IBHRE expects its staff, certified professionals, committee members, and related bodies to comply with the above impartiality statement and not to participate in any activity that violates IBHRE's Conflict of Interest Policy. Additionally, through certification personnel standards and best practice, IBHRE staff is required to identify impartiality threats in order to reduce any risks to IBHRE's certification process.

Download Impartiality Policy

Candidate Confidentiality

Information provided by exam candidates and certified professionals is used by IBHRE to develop relevant statistical data while holding individual identification in full and complete confidence. Personal information provided on exam applications is stored in a secure electronic database only accessible to IBHRE and the Information Technology staff of HRS. Paper applications are kept in a locked file cabinet on the premises of IBHRE headquarters for a minimum of one (1) year until it is transferred to a secure, off-site storage facility. IBHRE holds all candidates' personal information and exam status in the strictest of confidence unless expressed permission is provided by the candidate to release any or all of that information to a third party.

Candidates who successfully complete an IBHRE examination are listed on the IBHRE website as IBHRE certified professionals. By submitting the exam application, a candidate authorizes IBHRE to add their name and exam year to the website provided (and only if) they receive a passing score. By submitting the exam application, a candidate also authorizes IBHRE to respond to verification requests from third parties regarding the status of their certification. Certification is verified by providing a yes/no response to a candidate's current status, date of initial certification and expiration date. All other data and information regarding exam scores and performance are kept fully confidential from third parties unless expressed permission is submitted by the candidate to disclose said information. Other confidential information that will not be released includes names of candidates for certification and names of candidates who fail the examination. If under legal obligation to release exam results, IBHRE will comply to do so.

Item 3: IBHRE Certification Designations

Candidates who pass an IBHRE examination, as indicated on the official score report mailed to the candidate following the test administration, may use the appropriate certification credential that corresponds with the exam they successfully completed. The most appropriate method of displaying credentials is to include the initials of the designation to the right of the certified professional's name. Upon successful completion of the exam, IBHRE automatically includes these credentials, along with any other designations an exam candidate has reported, on all written correspondence that may follow the examination while the certified professional remains certified. IBHRE credentials may also be written discreetly on letterhead or a business card at the option of the certified professional. If so used, the type should be neither larger nor bolder than the certified professional's name.

Item 4: Proper Use of IBHRE Marks and Designations

The following are a series of guidelines regarding fair and proper use of all titles, logos and marks associated with the IBHRE brand. To review a complete policy regarding the use of licensed marks, please refer to IBHRE.org.

Organization Name

Appropriate titles to use when referring to the IBHRE organization or its programs include:

- The International Board of Heart Rhythm Examiners®
- IBHRE

Proper Use

Other organizations and individuals not directly associated with IBHRE may only make nominative fair use of the IBHRE name to make true, factual statements about the IBHRE organization, its exams and programs. Reference to IBHRE may be made in a complete sentence, as it would be used in the ordinary course of use of the English language:

Improper Use

Other organizations and individuals not directly associated with IBHRE may NOT use the marks:

- As part of their own business name, as part of a brand name for their own product, as an internet domain name, in whole or in part, or as a keyword search term for their web address
- As part of a tagline or advertising blurb
- In any way that would create confusion regarding the ownership of the name

Certification Examinations

The following are the official titles of the IBHRE Certification Exams:
• Certification Examination for Competency in Cardiac Rhythm Device Therapy for the Physician and Allied Professional
• Certification Examination for Competency in Electrophysiology for the Allied Professional
• Certification Examination for Competency in Electrophysiology for the Physician-Adult
• Certification Examination for Competency in Electrophysiology for the Physician-

Proper Use

The official titles of all IBHRE certification exams must be used in full when making reference to the exams in an official capacity (e.g. advertisements, contracts, applications). When appropriate, the exam titles may be condensed (such as the certification acronym followed by “exam”) to accommodate spacing issues in printed materials or to achieve a less formalized tone.

In such instances, the condensed title should communicate the following:

- Professional discipline of the exam (e.g. cardiac rhythm device or electrophysiology), fully typed or in acronym
- Professional group the exam is designated for (i.e. physician or allied professional)
- The exam as a means of achieving certification

When referring to any of the IBHRE exams the mark “IBHRE” should always precede the exam title.

Improper Use

The IBHRE certification exams may NOT be referred to as any of the following:

- NASPExAM
- IBHRExAM
- Exams belonging to an organization other than IBHRE

Certification Designations

• Certified Cardiac Device Specialist (Allied Professional)	CCDS
• Certified Cardiac Device Specialist (Physician)	CCDS
• Certified Electrophysiology Specialist (Allied Professional)	CEPS
• Certified Electrophysiology Specialist-Adult (Physician)	CEPS-A
• Certified Electrophysiology Specialist–Pediatric (Physician)	CEPS-P
• Cardiac Device Remote Monitoring Specialist (Allied Professional)	CDRMS

Proper Use

Successful exam candidates may refer to themselves according to the designation that corresponds with the exam they completed. Certified physicians and allied professionals may include the acronym of their respective designation next to their name. IBHRE credentials must appear in the same font and size as the name when appearing on letterhead, business cards or any other documents depicting the certified professional’s credentials.

Improper Use

Anyone who has not successfully completed an IBHRE certification exam is not eligible to use the IBHRE credentials. Exam candidates who have taken the IBHRE exam but have not received official notification of their score may not use the credentials until a passing score is confirmed.

Logos

Certified physicians and allied professionals may make use of IBHRE-approved logos when promoting themselves, which are available on IBHRE.org.

Proper Use

IBHRE logos may be used in conjunction with promoting the certification accomplishment or the credentials of a certified individual on letterhead, business cards or any other printed material that directly associates the certified professional's name with the logo. Logos may be cropped or resized to fit the formatting parameters of the printed materials. High resolution copies of the logos are available upon request.

Improper Use

IBHRE logos may not be associated with the name of anyone who is not certified by IBHRE. Logos may not be altered in any way that changes the language or design of the logo. Use of logos pertains to individuals only and may not be used by organizations or companies other than IBHRE or the Heart Rhythm Society without expressed permission from IBHRE.

Consequences for Improper Use of Marks

IBHRE logos are intended for the exclusive use of IBHRE certified professionals. Misuse of the IBHRE credential or logo may result in denial of initial certification, recertification, revocation, suspension, or any other limitation of a certification or combination of sanctions. IBHRE further reserves the right to take any legal action as it deems reasonable or appropriate in any court or other tribunal having competent jurisdiction with respect to the matter.

Item 5: Continuing Competence

IBHRE transitioned away from its 10-year maintenance exam to a real-time competency validation process that helps specialists remain current in their area of expertise while maintaining their credential. The program, IBHRE-Continuous Competency, Continuous Learning, Continuous Certification (C3), is an innovative approach to longitudinal assessments that includes literature review, content retention, and knowledge validation.

A completely virtual process, IBHRE-C3 is based on a specialists' successful completion of 12 online assessments, per certification. It is a continuous competency program that encourages specialists to stay abreast of developments in their specialty area by reviewing scientific literature, including published manuscripts, journal articles, peer papers, and consensus statements. This literature is reflective of topics included in IBHRE certification exam content outlines. Specialists have two calendar years, which is considered a cycle, to complete all 12 assessments. **Note: C3 is not based upon a rolling calendar.**

All newly certified specialists are required to participate in IBHRE-C3. Specialists who earned an IBHRE credential prior to 2022, are encouraged to participate in the program. Those who choose not to enroll into IBHRE-C3, must take the 10-year maintenance exam prior to the end of their certification period. Failure to pass the maintenance exam or complete a required C3 cycle will forfeit your certification.

Note that the 10-year maintenance exam will be phased out by the end of 2031. Specialists who earned certification October 2021 and later must enroll in C3. Individuals who are non-compliant with IBHRE policies and processes will not be listed on the active certification list at IBHRE.org. For more information on IBHRE-C3, visit IBHRE.org/IBHRE-C3.

Specialists seeking a one-year extension who plan to take the comprehensive exam must:

- Submit a request to info@ibhre.org. Use subject line: Extension Request
- Apply for the following year's exam by the appropriate deadline

Individuals who do not adhere to IBHRE procedures for maintaining certification will be inactive and their name removed from the website.

Item 6: Verification of Certification Status

IBHRE will routinely respond to inquiries regarding a professional's certification status. Certification is verified in writing through a standard form that provides confirmation of the candidate's current certification status, date of initial certification, certification ID number and expiration date. All other data and information regarding exam scores and performance are kept fully confidential from third parties unless permission is granted in writing by the candidate or certified professional.

Item 7: Grievance Policy

This Grievance Policy describes the procedure to be followed by the IBHRE Board of Directors or any other panel granted proper authority by the Board of Directors to investigate and ultimately decide upon grievances brought forward pertaining to individuals certified by IBHRE.

1. Upon receipt of written notification of a possible violation, IBHRE shall, in its sole discretion, decide to investigate the allegation or decline to act on the matter. Official notice of IBHRE's decision to pursue investigation will be sent to the claiming party within 30 days of receipt.

2. If IBHRE believes that there has been a possible violation of the conditions listed in the Code of Ethics for IBHRE Certified Professionals, IBHRE shall provide the accused party with written notice of the allegations.

3. The accused party will be granted 30 days from the date of notification to submit a written appeal/ rebuttal of the claim to the IBHRE Board of Directors setting forth in reasonable detail the facts and circumstances supporting the accused party's appeal/rebuttal. IBHRE may also conduct its own investigation of the accusation utilizing any and all resources at its disposal including but not limited to:

- IBHRE official records including signed agreements submitted by candidate or certified professional Archived records created and housed by IBHRE's contracted testing vendor
- Relevant information requested from the employer of the candidate or certified professional
- Relevant information requested from any credentialing or licensing board pertaining to professional designations or licenses presumed to be held by the candidate or certified professional
- Relevant information requested from the law enforcement or governing body the jurisdiction under which the candidate or certified professional performs his or her activities

IBHRE shall use commercially reasonable efforts to conduct its own investigation promptly following receipt of the accused party's appeal/rebuttal.

4. If a written appeal/rebuttal is not received from the accused party by the prescribed deadline, IBHRE will make a final decision regarding the claim and determine appropriate sanctions based on the initial claim and any evidence collected by IBHRE in any independent investigation. IBHRE shall be under no obligation to conduct an independent investigation, and any determination to do so, shall be in the sole discretion of IBHRE.

5. If a written appeal/rebuttal is submitted by the prescribed deadline, IBHRE will postpone its final decision for 15 days during which time the Board of Directors will review the appeal and investigate any new evidence that my result from that review.

6. IBHRE will inform the grieving party and the accused party within 15 days of the final decision regarding the violation and the prescribed course of action. In the event that the accused party is found guilty of the violation in question, appropriate sanctions will be communicated in writing by IBHRE and will take immediate effect.

7. IBHRE will keep a permanent record of all grievances and the decisions that result from the review of the IBHRE Board of Directors.

SECTION IX: Additional Information

Item 1: Organizational Policies

The information provided in this handbook is reflective of relevant IBHRE policies as they relate to the administration of certification exams and the subsequent administration of IBHRE certification. All IBHRE policies are subject to change. Please refer to the IBHRE website at www.IBHRE.org for a complete listing of all current policies.

Item 2: Limited Liability

Neither IBHRE, nor PSI (individually a "Provider", and collectively the "Providers") shall be liable to any examinee or group of examinees or deemed in default for failure to perform any duty or obligation that such Provider may have where such failure has been caused by any act of God, fire, strike, inevitable accidents, war, acts of terrorism, internet failure, acts of nature, disruption or interruption of electrical or other source of power or other technical failure where the responsible Provider has exercised commercially reasonable care in the prevention thereof, or the cause of such circumstances is outside the control of the Provider.

In addition, no Provider shall be held liable for any cancellation, invalidation, withholding or change to any test score or other result where the Provider takes such action in good faith and reasonably believes that its actions are in the best interests of the administration of the examination. Providers shall use their commercially reasonable efforts to accommodate the reasonable requests of examinees where such requests are made to the Provider reasonably in advance of the examination. Providers shall have no obligation to accommodate or attempt to accommodate last minute requests of any nature or unreasonable requests. Providers shall not be liable for an examinee's failure to read, understand or abide by any policy established or instruction given by any Provider in connection with the administration of an examination.

Item 3: Non-Discrimination

IBHRE does not condone discrimination with regard to race, color, national origin, religion, sex, sexual orientation, age, disability or veteran status in employment nor in the certification programs that it operates. The IBHRE seeks to make all programs and services, including electronic and information technology, accessible to people with disabilities. In this spirit and in accordance with the provisions of Sections 504 and 508 of the Americans with Disabilities Act, the Board provides medical professionals with reasonable accommodations to ensure equal access to programs and activities of the Board.

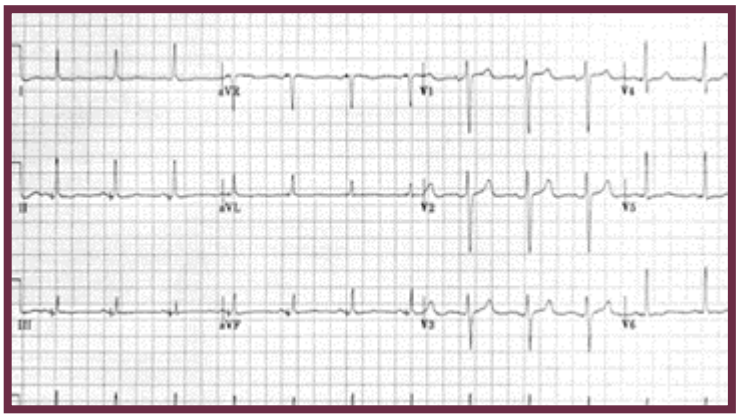
Item 4: Contact Information

International Board of Heart Rhythm Examiners
1325 G St. NW Suite 500
Washington DC 20005

info@ibhre.org **or** C3@ibhre.org
IBHRE.org

Item 5: Sample Exam Questions

The following scenarios are examples of the question type and format that can be found in IBHRE's examinations.



1) The ECG recording shown above is obtained from a 55-year-old man who underwent implantation of a dual-chamber pacemaker one day ago. Which of the following is the most appropriate next step in evaluating this pacemaker?

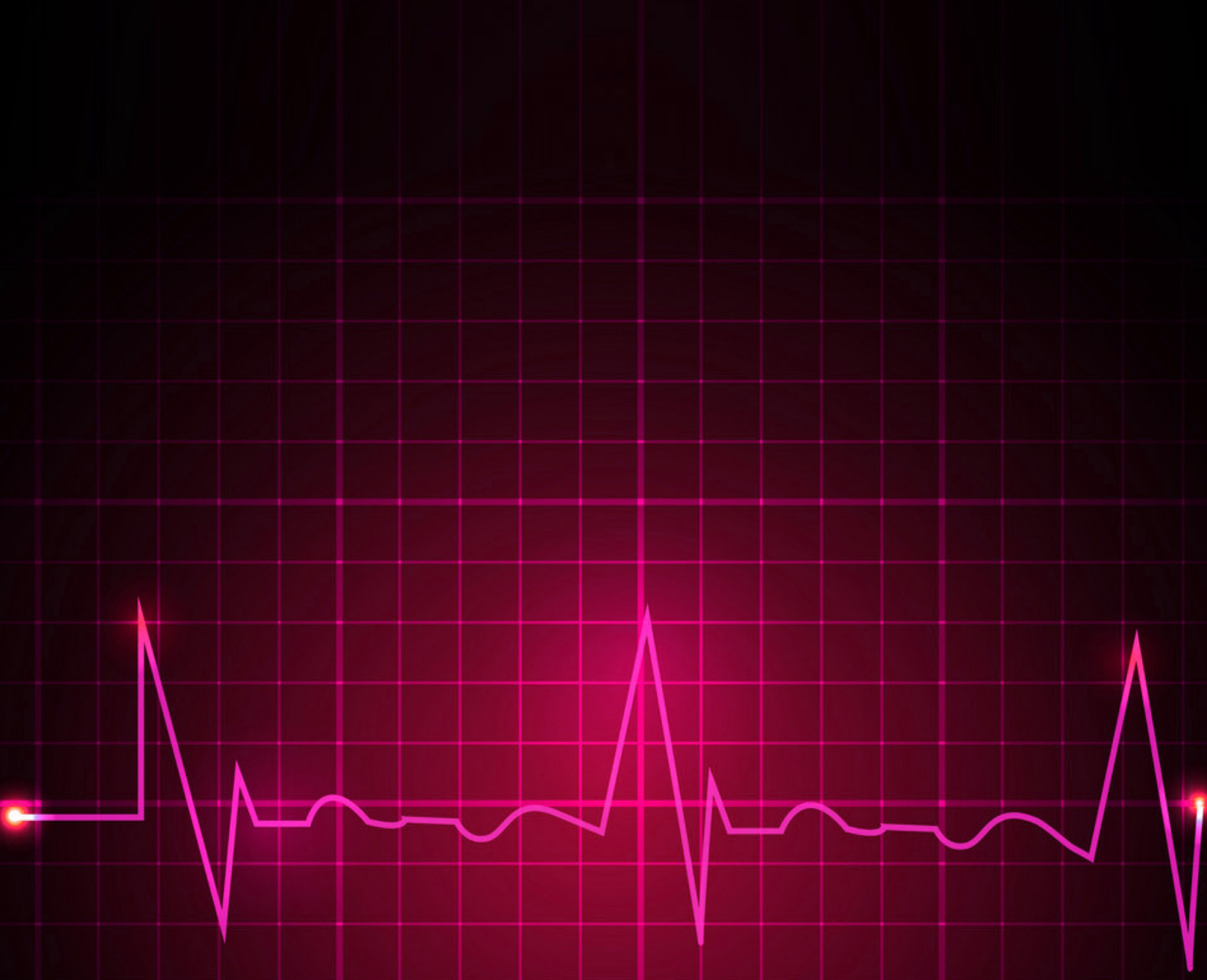
A. Shorten the AV delay
B. Test atrial capture threshold
C. Test atrial sensing
D. Test ventricular capture threshold
E. Test ventricular sensing

Answer: D

2) A 76-year-old man with a history of syncope, inducible VT and ICD placement presents with 3 episodes of lightheadedness followed by shocks over the last 4 days. He is currently taking enalapril, metoprolol, lasix, and aspirin. Interrogation reveals only these 3 episodes since his last interrogation and all 3 stored electrograms are identical. Which of the following would you recommend now?

A. Add amiodarone and retest
B. Add digoxin
C. Add a sudden onset discriminator
D. Disable ATP, leave as 1 zone device
E. Increase ATP to 8 attempts with a ramp protocol and retest

Answer: A



IBHRE INTERNATIONAL BOARD OF HEART RHYTHM EXAMINERS

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info@ibhre.org

IBHRE.org

Connect with Us

12/157/2023