

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)

Welcome Heart Rhythm Management Professional!

Congratulations for taking the first step toward earning one of four world-renowned certifications 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 the IBHRE Certification.

IBHRE offers certifications based in specific areas of the heart rhythm management field. Each certification can be obtained by qualifying for and completing 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

This Handbook summarizes key aspects of the IBHRE Certification program, and is intended to help you understand why the program was developed, how it is governed, its policies and procedures and 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 Certification is a globally recognized program defined by leading United States and international experts in the field of heart rhythm management. The exams thoroughly test competencies necessary to provide quality patient care in cardiac pacing and electrophysiology.

This Handbook cannot address every potential question, policy detail or program change. It will, however, act as a supplement to the program information provided on the IBHRE website (www.IBHRE.org). You may also contact IBHRE staff at 202-464-3414 with additional questions.

Good luck and best wishes on earning IBHRE Certification.



Table of Contents

section i: ABOUT IBHRE	3	section v: EXAM PREPARATION	22
1. Mission of IBHRE		1. Exam Preparation Disclaimer	
2. Organizational History		2. Exam Preparation and Study Tips	
3. IBHRE/HRS Relationship Statement		3. Recommended Reading Lists	
section ii: CERTIFICATION PROGRAM	4	4. IBHRE Endorsed Study Tools	
1. What is IBHRE Certification		5. Computer-Based Testing Tutorials	
2. Why Become Certified		6. Online Information Resources	
3. Examinations Offered		section vi: EXAM DAY	24
4. Accreditation		1. What to Bring	
section iii: EXAM INFORMATION	6	2. Testing Session	
1. Exam Development		3. Break Time	
2. Exam Topics		4. Test Center Regulations	
3. Exam Scoring		5. Exit Survey	
4. Score Reliability		6. Exam Security	
5. Rescoring		7. Complaints	
6. Exam Administration		section vii: POST-EXAM	28
7. Exam Language		1. Exam Results	
8. Exam & Question Format		2. Successful Candidates	
9. Exam Blueprint: CCDS		3. Certificates	
10. Exam Blueprint: CEPS (Allied Professional)		4. Certification Pins	
11. Exam Blueprint: Shared Core Sections for CEPS-A and CEPS-P (Physician)		5. Retaking the Exam	
12. Exam Blueprint: CEPS-A (Physician)		6. Name Change Requests	
13. Exam Blueprint: CEPS-P (Physician)		section viii: IBHRE CERTIFICATION	30
section iv: CANDIDATE INFORMATION	14	1. IBHRE Code of Ethics	
1. Certification Process		2. Confidentiality & Impartiality Statement	
2. Exam Dates & Registration Deadlines		3. IBHRE Certification Designations.	
3. Eligibility Requirements		4. Proper Use of Marks and Designations	
4. Review and Appeals Policy		5. Verification of Continuing Education & Recertification	
5. Exam Application Process		6. Verification Requests	
6. Fees & Submission of Payment		7. Grievance Policy	
7. Cancellations & Refunds		section ix: ADDITIONAL INFORMATION	39
8. Computer-Based Testing Centers		1. Organizational Policies	
9. Scheduling Exam Appointments		2. Limited Liability.	
10. Requesting Special Accommodations.		3. Nondiscrimination.	
		4. Contact Information	
		5. Exam Sample Questions	

section i: ABOUT IBHRE

1. IBHRE Mission Statement

The mission of The International Board of Heart Rhythm Examiners (IBHRE) is to increase the heart rhythm professional's knowledge in order to improve the quality of care delivered to our patients.

2. Organizational History

IBHRE is a nonprofit credentialing organization based in Washington, DC. It is a legally separate entity under the auspices of the Heart Rhythm Society (HRS) – the international leader in science, education and advocacy for cardiac arrhythmia professionals and patients, and the primary information resource on heart rhythm disorders.

Established in 1985 as NASPEXAM, IBHRE is a self-governing, credentialing organization of the Heart Rhythm Society 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 and surgeons. 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.

3. IBHRE/HRS Relationship Statement

IBHRE recognizes the Heart Rhythm Society as an integral part of the cardiac arrhythmia community and moreover as a positive contributor to the professional development goals of the IBHRE exams.

An affiliate, independent body of the Heart Rhythm Society, IBHRE is enriched by cardiac arrhythmia health care professionals who strive for excellence and optimal health care by passing this distinguished exam. Participation in the exam is consistent with the Heart Rhythm Society's overall purpose to improve the care of patients by promoting research, education and optimal health care policies and standards. Working together to standardize the profession, IBHRE and HRS provide the most current testing and professional development tools with advances in heart rhythm management to enhance knowledge and delivery of health care to patients.

section ii: CERTIFICATION PROGRAM

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 a written exam. 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 among IBHRE competency recognition recipients
- Enhancing the credibility of the certified professional 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.

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

3. Examinations Offered

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

Successful completion of the *Certification Examination for Competency in Cardiac Rhythm Device Therapy* or *Certification Examination for Competency in Cardiac Electrophysiology* 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 completed the examination. Similarly, IBHRE does not intend to interfere with or to restrict the professional activity of an allied professional because of these examination processes.

4. Accreditation

IBHRE's certification programs are accredited by the American National Standards Institute (ANSI) under ANSI/ ISO/IEC 17024 (General Requirements for Bodies Operating Certification Systems of Persons) for many of its certification programs (ANSI accredited Certifier- #0787). ANSI is a global leader in operating standards and conformity assessment systems.



Accreditation ID#0787

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.

section iii: EXAM INFORMATION

1. Exam Development

The IBHRE certification examinations are written and developed by members of the IBHRE test writing committees. Currently, three active committees are responsible for developing the IBHRE exams. The Cardiac Device Test Writing Committee is responsible for developing the cardiac rhythm device therapy examinations for physicians and allied professionals. The Cardiac Electrophysiology Test Writing Committee is responsible for developing the electrophysiology examination for allied professionals and the Physician Cardiac Electrophysiology Test Writing Committee is responsible for the development of the electrophysiology examination for physicians (adult and pediatric). A Japanese language exam is developed by IBHRE's Japan Editorial Team and Test Translation Committee. Each committee is composed of a diverse pool of distinguished leaders in cardiac rhythm management who work year-round to write and review exam questions.

The questions developed for each exam are determined by an exam blueprint, 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 of cardiac rhythm management 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 the examinee and employer 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 questions and exam forms is carried out by the IBHRE test-writing committees in conjunction with the National Board of Medical Examiners (NBME). The Cardiac Device and Allied EP exams consist of 200 questions, and the Physician EP exams are comprised of 175 questions. Previously used items which have been deemed clear and unambiguous are incorporated as one quarter of a current examination, so that the examinee (and group performance for an examination year) can be compared to others from previous groups. All questions, including those with statistical examination histories, are reassessed to ensure validity. Questions are not designed to be product-specific unless a topic area is defined by a single device. Only items which are commercially available (have passed clinical testing) in the United States may be the basis of an examination item. This requirement also may force product-specific questions. Questions are meant to measure the core knowledge that a heart rhythm candidate should know, whether US or international-based.

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 pre-established blueprint also known as the 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.

3. Exam Scoring

IBHRE exams are scored using psychometric procedures to ensure validity and reliability. Following each exam administration, all 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 the IBHRE Standard-Setting Committee. The standard is determined based on the results of a content-based standard-setting study and is partially dependant upon the relative performance of the entire testing group.

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.

5. Rescoring

Although IBHRE has full confidence in the methods and procedures used to evaluate the examinations, candidates may request a rescoring of their exam. Requests for a rescore must be received in writing within 30 days of the score release. Rescore requests are subject to a \$75 fee. Candidates should allow four to six weeks to receive a response. Rescore results are sent directly to the candidate by IBHRE and are considered final. Any attempts to appeal a rescore will not be recognized.

6. Exam Administration

All IBHRE exams are administered via computer, once per year, during a one-day (24-hour period) testing window through Prometric test centers. Exam candidates approved to take the exam are given a scheduling permit, which enables them to schedule their testing appointment at a testing center near them on the assigned exam date. Four and one half to five hours is allocated for exam appointments unless special accommodations, requested under the Americans with Disabilities Act, have been arranged. Exam start times are expected to vary due to differences in international time zones and the schedules of individual test centers.

Note: Effective May 2018, the Physician EP exam will be given every other year (even years: 2018, 2020, etc.). Visit ibhre.org for more information.

7. Exam Language

All IBHRE certification exams are administered in English. IBHRE also administers the Certification

Examination for Competency in Cardiac Rhythm Device Therapy in the local language in Japan. IBHRE can work with groups interested in administering translated exams. For more information about international and foreign language partnership opportunities, contact IBHRE's Executive Director at Info@ibhre.org.

8. Exam & Question Format

The IBHRE CCDS and CEPS (Allied Professional) examinations consist of 200 multiple-choice questions, while the Physician EP exams consist of 175 questions. For security purposes, Prometric scrambles the order of exam questions as they are delivered through computer-based testing. Exam questions are presented in multiple-choice format where only one answer is considered correct. 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 in order 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 Preparation* in this Handbook for more information.

9. Exam Blueprint: CCDS

I. Fundamentals of Electrophysiology and Electronics 3%

- A. Pathophysiology and Mechanisms of Dysrhythmias: Impulse Formation and Conduction
- B. Electrophysiology of Dysrhythmias
- C. Electronics; Sensing/Stimulation/Defibrillation
 - 1. Basic quantities (ampere, charge, coulomb, ohm, volt, hertz)
 - 2. Derived quantities (resistance, capacitance, battery capacity)
 - 3. Relationships (ohms law, power, energy)
 - 4. Wave forms

II. Applied Science and Technology 32%

- A. Pulse Generators [3.5%]
 - 1. Energy sources (battery chemistry and rationale)
 - 2. Electronic circuit components; capacitors, resistors, diodes
 - 3. Sensors; motion/accelerometer, MV, impedance (CLS)
 - 4. Software [Firmware]
- B. Leads and Electrode Materials [6%]
 - 1. Insulation (silicone, urethanes, hybrids)
 - 2. Conductors (composition coaxial, cable, coradial)
 - 3. Connectors/adapters/ IS1, DF-1, DF4, IS-R
 - 4. Electrodes (active, passive, steroid elution, OTW)
 - 5. Shock coil, integrated versus true bipolar
- C. Sensing [2.5%]
 - 1. Cardiac signals (EMGs, sensing amplifiers, filters, slew rate)
 - 2. Extracardiac signals (myopotentials, EMI)
- D. Stimulation [3.5%]
 - 1. Anode/cathode stimulation
 - 2. Stimulation/Defibrillation threshold
 - 3. Ohm's law: current, voltage, and impedance (calculation of)
 - 4. Strength duration; stimulation threshold. Wedensky effect
 - 5. Power and energy
- E. Timing Cycles [6%]
 - 1. Single chamber
 - 2. Dual chamber
 - 3. Rate modulation
 - 4. CRT (Biventricular)
 - 5. NBG code
- F. Algorithms [8%]
 - 1. Bradycardia/tachycardia pacing therapy
 - 2. Tachyarrhythmia detection
 - 3. SVT discrimination
 - 4. Antitachyarrhythmia pacing
- G. Defibrillation Concepts [1%]
- H. Physiologic Monitors [Implantable] (implantable loop recorders, pulmonary pressure) [1.5%]

III. Pharmacology 1%

- A. Drug/Device Interaction
- B. Drug Effects on Cardiac Rhythm and Conduction

IV. Electrocardiography 4%

- A. Electrocardiogram
 - 1. Paced rhythms
- B. Recognition of Dysrhythmias

V. Clinical Assessment 4%

- A. History
- B. Diagnostic Test Technologies
 - 1. Invasive
 - 2. Noninvasive (includes echocardiography)
 - 3. Basic anatomy (includes Bachman's bundle, RAA, RVOT, RV Septum, RVA, CS, cardiac veins, epicardial pacing)
 - 4. Common congenital anomalies

VI. Perioperative Practice/**Clinical Practice 23%**

- A. Indications for Device Therapy and Placement [9%]
 - 1. Bradyarrhythmias
 - 2. Tachyarrhythmias
 - 3. Chronic congestive heart failure
 - 4. Syncope/A-Fib (for ILRs)
 - 5. Major pediatric indications
- B. Device and Feature Selection [3%]
 - 1. Sinus node dysfunction
 - 2. Atrioventricular block
 - 3. Hemodynamics
 - 4. Pacing for tachyarrhythmias
- C. Surgical Technique [6%]
 - 1. Patient preparation (informed consent, documentation, chart review)
 - 2. Implantation
 - a. intraoperative testing
 - b. surgical procedure; lead placement
 - c. conscious sedation; IV analgesia, monitoring requirements
 - d. DFT testing (yes/no, typical DFT versus upper limit of vulnerability)
 - e. subcutaneous
 - f. leadless pacemaker
 - 3. Lead/pulse generator removal/extraction
- D. Surgical Complications [3%]
 - 1. Intraoperative
 - 2. Postoperative
- E. Pediatric Pacing (congenital anomalies/surgical issues) [1%]
- F. Endo of Life Issues (defibrillator deactivation, pacing therapy withdrawal)

VII. Safety 3%

- A. Infection Control
- B. Sterile Technique
- C. Radiation Safety

D. Device EMI Interaction**VIII. Patient and Device Follow-up****Management 27%**

- A. Assessment [History, Surgical site] [1%]
- B. Diagnostics; High Rate, Mode Switch Tabulation, EGM [4%]
- C. Programming (base rate, upper rate, longevity, RV pace reduction, hemodynamics) [6%]
- D. Device Assessment [10%]
 - 1. Clinical; rhythm therapy, rate modulation, hemodynamics
 - 2. Technological; assessment of capture/sensing
 - 3. Natural history of pulse generators/leads; Lead maturation, PG longevity ERI,EOL
 - 4. Programming management
 - 5. Sensing problems (oversensing, undersensing, includes subQ devices)
 - 6. Stimulation problems; failure to capture
- E. Pacing System Complications [4%]
- F. Remote Monitoring [2%]
- G. Documentation; Medical Charting

IX. Radiology 3%

10. Exam Blueprint: CEPS (Allied Professional)

I. Fundamentals of Electronics 2%

- A. Units of Measurement
 1. Basic quantities
 2. Derived quantities
- B. Relationship of Measurements
 1. Ohm's Law: Current, voltage and resistance
 2. Power and energy
- C. Signal Concepts
- D. Electronic Circuitry; Filter Settings

II. Cardiac Anatomy and Physiology 4%

- A. Cardiac Anatomy
- B. Hemodynamics of the Cardiovascular System

III. Basic Pharmacology 2%

- A. Types of Drugs
- B. Major Cardiovascular Responses; Pharmacokinetics

IV. Basic Electrophysiology 13%

- A. Anatomy of the Conduction System
- B. Electrophysiology of the Conduction System; Action Potential
- C. Abnormalities of the Conduction System
- D. Mechanisms of Arrhythmia
 1. Reentry, triggered activity, automaticity, anisotropy, reflection

V. Clinical Assessment 8%

- A. History
 1. No structural heart disease
 2. Acquired structural heart disease
 3. Congenital heart disease
- B. Cardiac Physical Exam
- C. Noninvasive Diagnostic Tests and Evaluation
 1. Signal average ECG
 2. Tilt table testing
 3. Ambulatory ECG monitoring, Event monitoring
 4. Stress testing
 5. Echocardiography: TEE, ICE
 6. Novel noninvasive diagnostic test technologies
- D. Inherited Arrhythmia Syndromes,

Channelopathies

VI. Electrocardiography 8%

- A. Normal Electrocardiogram, Recognition
- B. Transesophageal Electrocardiography
- C. Recognition of Arrhythmia, ECG Abnormalities
- D. Recognition of Pacemaker ECG

VII. Clinical Electrophysiology 10%

- A. Initial assessment
 1. Diagnostic workup
- B. Clinical evaluation of arrhythmia
 1. Response to drugs
 2. Response to vagal maneuvers
 3. Emergency management
- C. Indications, Contraindications for EP study

VIII. Laboratory Procedure 5%

- A. Laboratory Supplies, Equipment, Maintenance, Troubleshooting
- B. Patient Preparation for Procedure, ECG setup
- C. Catheterization Techniques, Trans-septal Approach
- D. Recording Techniques
- E. Risks and Complications
- F. Informed Consent/Documentation/Chart Review

IX. Safety

(A-E: 4%; F-G: 1%) 5%

- A. Infection Control
- B. Sterile Technique
- C. Radiation Physics/Safety
- D. Electrical Safety
- E. Drug interaction
- F. Device Interaction
- G. Recalls and Advisories

X. Invasive Electrophysiology 13%

- A. Baseline Assessment, Calculations (BPM to Cycle Length), Interval Measurements
- B. Methods of Recording and Evaluation
 1. Electrogram recognition
 2. Assessment of conduction system

- 3. Determination of refractory period
- C. Stimulation Protocols
- D. ECG Morphology During Intracardiac Pacing
- E. Evaluation of Arrhythmia
 - 1. Supraventricular tachycardia
 - 2. Ventricular tachycardia
 - 3. Response to stimulation
 - 4. Response to drug studies
 - 5. Differentiation of arrhythmia mechanisms
- XI. Mapping Techniques..... 10%**
 - A. Indications
 - B. Procedural Considerations
 - C. Methods/Strategies
 - D. Novel Mapping Technologies
- XII. Conscious Sedation..... 2%**
 - A. Intravenous Sedation Analgesia in the EP Lab
- XIII. Therapeutic Modalities
(A, B, D: 2%; C: 4%) 6%**
 - A. Pharmacotherapy
 - B. Device Therapy
 - 1. Antitachycardia pacing
 - 2. ICD tiered therapy
 - C. Catheter Ablation
 - D. Surgical Therapy
- XIV. Implantable Devices (Pacemaker,
ICD, CRT, Loop Recorder) 6%**
 - A. Pacemaker Modes and Basic Timing Cycles
 - B. Indications for Implantation of Devices,
Implant Threshold Testing and Implant
Troubleshooting
 - C. Recognition of Device Problems: EMI,
Sensing, Capture, Inappropriate
Therapy, Implantation Techniques, MRI,
Remote Monitoring
 - D. Lead Extraction
 - E. Device Implantation Techniques
- XV. Radiology (Chest X-ray, Fluoroscopy) ..5%**
 - A. Interpretation: Implanted Devices
 - B. Interpretation: Clinical Symptoms / Diagnosis
 - C. Interpretation: Catheter Positions
- XVI. Research Methodology
& Interpretation..... 1%**

11. Exam Blueprint: Shared Core Sections for CEPS-A and CEPS-P (Physician)

I. Core Section 1 30%

- A. Cardiac Anatomy and Physiology
- B. Basic Pharmacology - Antiarrhythmic Drugs
 - 1. Applications in specific arrhythmias
 - 2. Pharmacokinetics, Pharmacodynamics,
Pharmacogenetics
 - 3. Drug interactions
- C. Electrocardiography
 - 1. Recognition and localization of arrhythmia; ECG
abnormalities
 - 2. Recognition of pacemaker, cardiac
resynchronization device ECG
- D. Clinical Patient Assessment and Clinical
Electrophysiology
 - 1. Clinical history, examination, diagnostic workup,
non-invasive tests
 - a. No structural heart disease
 - b. Acquired structural heart disease
 - c. Congenital heart disease
 - d. Inherited arrhythmia syndromes,
channelopathies
 - 2. Clinical evaluation of arrhythmia
 - a. Response to drugs
 - b. Response to automatic maneuvers, diagnostic
maneuvers
 - c. Emergency management of arrhythmia,
symptoms

II. Core Section 2 55%

- A. Basic Electrophysiology
 - 1. Anatomy of the conduction system
 - 2. Cellular electrophysiology; Action Potential, ion
channels, gap junctions
 - 3. Electrophysiology/abnormalities of the conduction
system
 - 4. Mechanisms of arrhythmia
- B. Laboratory / Surgical / Implant Procedure
 - 1. Catheterization techniques, transseptal
catheterization; intracardiac echocardiography
 - 2. Surgical techniques for device implantation
 - 3. Surgical management of arrhythmias
 - 4. Procedural risks, complications; recognition and
management of complications
 - 5. Radiation safety

- C. Invasive Electrophysiology
 - 1. Baseline assessment
 - 2. Methods of electrogram recording and evaluation
 - 3. Stimulation protocols
 - 4. Evaluation of arrhythmias
 - a. Differentiation of arrhythmias
 - b. Response to pacing maneuvers
 - c. Response to antiarrhythmic drugs
 - d. Evaluation of arrhythmias post ablation
- D. Catheter Mapping and Ablation
 - 1. Procedural considerations
 - 2. Methods / strategies
 - 3. Mapping / ablation of arrhythmias
 - a. SVT (Accessory pathway mediated, AV nodal, Atrial Tachycardia)
 - b. VT (Bundle branch reentrant, idiopathic VT)

III. Core Section 3 15%

- A. Implantable Devices (Pacemaker, ICD, CRT, Loop recorder)
 - 1. Fundamentals of electronics, pacemaker modes and timing cycles
 - 2. Indications and Contraindications for implantation of devices, implant threshold testing and implant troubleshooting
 - 3. Pacemaker therapy, programming, antitachycardia pacing, algorithms
 - 4. ICD therapy, programming, detection algorithms, discrimination algorithms
 - 5. CRT therapy, programming, optimization
 - 6. Implantable loop recorder / cardiac monitor diagnostic assessment, programming
 - 7. Recognition and management of device problems: EMI, sensing, capture, inappropriate therapy
- B. Imaging in EP
 - 1. Fluoroscopic or Radiographic Interpretation: Implanted devices
 - 2. Fluoroscopic or Radiographic Interpretation: Clinical Symptoms / Diagnosis
 - 3. Fluoroscopic or Radiographic Interpretation: Catheter positions
 - 4. CT, MRI, Echo, 3D maps
- C. Moderate to Deep Sedation, Monitored Anesthesia Care, and General Anesthesia in the EP Lab
- D. Research Ethics, Methodology, Statistics & Interpretation

12. Exam Blueprint: CEPS-A (Physician)

Note: Refer to pages 11 – 12 for Core Sections 1 – 3.

IV. Adult Section 1 45%

- A. Pharmacology in Adult Population
 - 1. Antiarrhythmics, antihypertensives, diuretics, ACE inhibitors, statins
 - 2. Anticoagulation management in adult population
- B. Clinical Assessment and Clinical Electrophysiology in Adult Population
 - 1. Arrhythmias in co-morbid conditions
 - a. Coronary artery disease, renal disease, diabetes, stroke, pulmonary disease, valvular heart disease, inflammatory heart disease
 - b. Adult congenital heart disease, cardiomyopathies
 - 2. Arrhythmias in pregnancy, athletes, post heart transplant
 - 3. Cellular Electrophysiology, Autonomics, Genomics of Sudden Cardiac Death in Adult Population

V. Adult Section 2 35%

- A. Invasive Electrophysiology Studies Catheter Ablation Mapping in Adult Population
 - 1. Procedural indications and contraindications
 - 2. Atrial arrhythmias / Atrial fibrillations / Atrial flutter
 - 3. Ventricular arrhythmias (associated with ischemic heart disease, cardiomyopathies, genomic syndromes, adult congenital heart disease)

VI. Adult Section 3 20%

- A. Applications of Implantable Devices (Pacemaker, ICD, CRT, Loop recorder) in Adult Population
 - 1. Indications and uses of implantable devices to manage or to diagnose arrhythmias
 - 2. Recognition and management of device implant complications; Lead extraction in adults and adult congenital heart disease patients
 - 3. Geriatrics, end of life management, device deactivation, ethics
- B. Translation from Clinical Research to Adult Patient Management
 - 1. Clinical trials in implantable device

2. Clinical trials in drug management

3. Clinical trials in arrhythmia management

13. Exam Blueprint: CEPS-P (Physician)

Note: Refer to pages 11 – 12 for Core Sections 1 – 3.

IV. Pediatrics Section 1 21%

A. Developmental Electrophysiology - Basic Science to Clinical Impact in Pediatrics

1. Embryology of the specialized conduction system
 - a. In normal heart
 - b. In congenital heart disease
2. Development of electrophysiology
 - a. Depolarizing currents
 - b. Autonomic nervous system effects on the cardiac conduction system
 - c. Electrophysiological properties and substrates of arrhythmias
3. Developmental pharmacokinetic and pharmacodynamic of antiarrhythmic drugs
 - a. Related to maturation, from fetus to adolescent
 - b. The pregnant adult
 - c. Breast milk feeding
4. Biophysical effects
 - a. Radiofrequency energy delivery in growing hearts
 - b. Cardioversion and defibrillation energy through physical maturation

B. Electrophysiology of Congenital Heart Disease in Pediatrics

1. Congenital substrates of arrhythmias (e.g. Anatomy of conduction system in L-TGA, canal, TOF/VSD; Association of WPW with specific CHD; Concept of twin AV nodes in heterotaxy)
2. Etiology of AV block and congenital heart disease
 - a. Transcription factor mutations
3. Acquired substrates of arrhythmia
 - a. Natural history - e.g. Cyanosis, volume or pressure overload
 - b. Related to open heart surgery
 - c. Comorbid condition

V. Pediatrics Section 2 64%

A. Clinical Management of Pediatric

Electrophysiology

1. Fetal arrhythmias
2. Newborn arrhythmias
3. Ventricular arrhythmias in the structurally normal heart
4. Inherited arrhythmia syndromes channelopathies
5. Arrhythmias in CHD and post-CHD surgery

6. Sudden death risk assessment for all cardiac and non-cardiac conditions in children
7. Arrhythmias associated with non-cardiac conditions affecting children

B. Invasive Electrophysiologic Testing in Children and in Patients with Congenital Heart Disease

1. Sedation and anesthesia
2. Procedural indications and contraindications
3. Procedural considerations regarding vascular and cardiac access of catheters
4. EP testing, mapping and ablation strategies
 - a. In the structurally normal heart
 - b. In the congenital heart disease
 - i. Twin nodal SVT
 - ii. Accessory pathways associated with CHD
 - c. Post-surgical CHD
 - i. Scar-related IART
 - ii. Scar-related FAT
 - iii. Scar-related VT
5. Techniques and results of surgical ablation in patients with congenital heart disease

VI. Pediatrics Section 3 15%

A. Implantable Devices in Children and Patients with Congenital Heart Disease

1. Indications and contraindications for implantation
2. Strategies for hardware placement
 - a. In children too small for transvenous approaches
 - b. In congenital heart defects
3. Recognition and management of device and lead complications for epicardial and endocardial systems
4. Lead extraction / lead burden issues in pediatrics
5. Lifestyle issues and psychological effects of device implantation and device malfunction in children
6. Ancillary testing to optimize device programming in children and patients having congenital heart disease

section iv: CANDIDATE INFORMATION

1. Understanding the Certification Process

Certification by the International Board of Heart Rhythm Examiners (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. Candidates who become certified are required to renew their certification by reexamination every 10 years in order to keep the IBHRE credential. Certified professionals must also complete 45 contact hours of professional development activities five years after passing the exam. Certified professionals who do not renew their certification may no longer refer to themselves as certified by IBHRE.

2. Exam Dates & Registration Deadlines

Exam dates and registration deadlines are subject to change and are regularly updated on the IBHRE website at www.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.

3. Eligibility Requirements (Refer to IBHRE.org for complete policy)

1) **Applicants for the CCDS (Physician)** must be a licensed physician or physician fellow-in-training. Physicians applying for the certification must also:

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

OR

b. 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.

2) **Applicants for the CCDS (Allied**

Professional) must demonstrate that they are actively involved in the practice of heart rhythm management and that they have:

a. Successfully completed a formal comprehensive training program in electrophysiology that facilitates a minimum of six months didactic training and exposure to the field.

OR

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

OR

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

3) Applicants for the CEPS (Allied Professional)

must demonstrate that they are involved in the practice of heart rhythm management and that they have:

a. 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

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

OR

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

4) Applicants for the CEPS-A or CEPS-P (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 examinations:

a. Adult Cardiac Electrophysiology

b. Pediatric Cardiac Electrophysiology

The IBHRE Physician EP exam 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 exams should utilize that pathway to achieve Board Certification. Please refer to the IBHRE website for the complete eligibility policy.

Required Documentation

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

Required documentation for submission is as follows:

Physicians

- A copy of the current medical license from the state, province or country for current practice
- A certificate/diploma of completion of medical school **and** residency programs specifying dates of completion

- 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 requirements).

Allied Professionals

- At least one letter of recommendation from an immediate supervisor, human resources, 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 cardiac rhythm management (Cardiac Pacing, Electrophysiology, or Cardioversion Defibrillation), years of experience in the field, 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 or Registered Cardiovascular Invasive Specialist) in cardiac pacing or electrophysiology) Accepted training programs for allied professionals applicants include, without being limited to: Arrhythmia Technologies Institute, PrepMD, and Cardiac Electrophysiology Institute of Australia.)

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 given

no special consideration when determining eligibility.

4. 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 International Board of Heart Rhythm Examiners 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

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 the Executive Director, IBHRE, 1325 G Street NW, Ste 400, Washington, DC 20005; Fax: 1-877-386-1044. The Director shall forward the appellant's claim to the Review & Appeals Committee who shall commence the appeals process.

Requests for an examination rescore are a separate category of appeal and will be subject to a \$75 fee. Rescore requests may take as many as 45 days from the receipt of request to furnish a response. All other appeal requests are subject to a \$150 fee.

For a complete description of the Review and Appeals Process, please refer to the IBHRE Review and Appeals Policy found at www.IBHRE.org.

5. Exam Application Process

Exam applications are available on the IBHRE website (www.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.

The standard application is available in an online format. PDF versions of the application are 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 at 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 letter will only confirm approval and does

not allow the candidate to schedule their test appointment. Scheduling permits to take the computer-based examination will be distributed four to six weeks following the close of registration.

All communications regarding the IBHRE exam, will be sent by e-mail. Candidates are reminded to provide a current e-mail address at the time of application and to inform IBHRE of any changes.

6. Fees & Submission of Payment

The International Board of Heart Rhythm examiners is proud to introduce a new fee schedule, including discounts for returning examinees. IBHRE will provide a discount to EP fellows who take the IBHRE Exam within one year of completing their fellowship training.

Exam Fees:

2020 CCDS Exam	Physician	
	Member	Non-member
First-time Candidates, Early	\$1310	\$1505
First-time Candidates, Standard	\$1435	\$1780
Re-take & Recertification Candidates, Early	\$1185	\$1370

Re-take & Recertification Candidates, Standard	\$1310	\$1610
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2020 CCDS Exam	Allied Professional	
	Member	Non-member
First-time Candidates, Early	\$1195	\$1370
First-time Candidates, Standard	\$1300	\$1475
Re-take/Recertification Candidates, Early	\$1055	\$1240
Re-take/Recertification Candidates, Standard	\$1175	\$1310

2020 CEPS Exam	Allied Professional	
	Member	Non-member
First-time Candidates, Early	\$950	\$1110
First-time Candidates, Standard	\$1055	\$1165
Re-take/Recertification Candidates, Early	\$860	\$1010
Re-take/Recertification Candidates, Standard	\$965	\$1055

2020 CEPS-A and CEPS-P Exams	Physician	
	Member	Non-member
First Time Candidates	\$1590	\$1870
Re-take/Recertification Candidates	\$1480	\$1760

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

7. Cancellation & Refunds

Cancellation requests must be submitted in writing by the exam candidate prior to the exam date. A \$85 processing fee will be withheld for all cancellation requests, in addition to the

cancellation fees listed below. Telephone requests will not be honored.

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

- 6 weeks prior to the exam date – fees will be refunded less \$325
- 4 weeks prior to the exam date – fees will be refunded less \$525
- 2 weeks prior to the exam date 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 a \$85 processing fee.

8. Computer-Based Testing Centers

All IBHRE certification examinations are administered once per year by computer-based testing at Prometric testing centers in more than 50 countries. Prometric 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 www.prometric.com/IBHRE.

9. Scheduling Exam Appointments

Accessing the Scheduling Permit For:

- **CCDS Exam (Physician and Allied Professional)**
- **CEPS Exam (Allied Professional)**

Approximately six weeks after the registration deadline date, candidates will be sent an electronic link to access their scheduling permit. The permit is the candidate’s confirmed approval to take the computer based examination, however they will still need to schedule a test site through Prometric. The permit will include a scheduling number and a candidate ID# which grants access to the exam on the examination day. **Candidates must bring their scheduling permit to the examination site.**

- 1) Go to <http://examinee.nbme.org/documents/IBHRE>.
- 2) Enter first name, last name and Customer ID number and login.
- 3) Enter a valid e-mail address when prompted.
- 4) Select the ‘Print Scheduling Permit’ link and the permit will open in a new browser window.
- 5) Use the browser’s ‘print’ function to print the permit.

Scheduling For:

- **CEPS-A and CEPS-P Exam (Physician)**

Approximately six weeks after the registration deadline date, candidates will be sent an email

with detailed instructions on how to schedule your exam appointment at a Prometric test site.

Note: The scheduling procedures for the Physician EP exam differ slightly from other IBHRE exams. You are not required to bring a scheduling permit to schedule your exam appointment, or to enter the testing site. Proper identification will be required.

- 1) Go to <http://www.prometric.com/ihr>
- 2) Choose the country and state (if applicable) where you would like to test
- 3) Click on Schedule an Appointment
- 4) Enter your Eligibility ID (IBHRE Customer ID #) and then the first four letters of your last name.
- 5) Enter your location to find the closest Prometric Test Centers
- 6) Click on Schedule an Appointment next to the center where you would like to test
- 7) Click on Find Available Seats on a specific day and then click on GO
- 8) The available appointment times will display on the right where you can choose your start time.
- 9) Click on the start time you would like and click on Next
- 10) Enter your country from the drop down box, your state (if applicable) and the other required (*) information
- 11) Enter your email address, then confirm it in the validate your email field, and confirm or supply a work/day phone number where Prometric could reach you if necessary, then click Next
- 12) Click on complete your appointment to finalize the appointment.

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

email confirmation for your records.

Scheduling Online

In order to schedule online you must provide a valid e-mail address and phone number. This information is necessary for Prometric 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 Prometric testing center near them. Exam appointments are given out by Prometric on a first-come, first-served basis and no exam appointments can be scheduled 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 their permit 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 Prometric 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 do not notify IBHRE at least three weeks prior to the exam of scheduling issues will not be guaranteed special assistance with securing an appointment. All cancellation and refund policies apply to candidates who fail to schedule their appointments in a timely manner.

Candidates who need to change exam sites within the same country or region where they are registered may do so by contacting Prometric by noon local time at the Regional Registration Center noted on their permit at least two business

days before the exam date. Candidates will need to provide their Prometric confirmation numbers when rescheduling. If less than two business days' notice is provided, Prometric will charge a fee to reschedule the appointment at the alternate location. Candidates who wish to take the exam in a country other than the one they were previously registered in must submit a request to IBHRE no later than four weeks prior to the exam.

10. Requesting Special Accommodations

IBHRE 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).

To support a request for special accommodations, candidates must submit the following documentation with the application:

- The Special Testing Accommodations/ Disability Request Form, completed and signed by the candidate and indicating the nature of the disability and the special accommodations needed. (Form available at www.IBHRE.org.)
- A signed letter from an appropriate and qualified healthcare professional.

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 special accommodations documentation within five business days of the date the online application is submitted.

Candidates approved for test accommodations will receive their scheduling permit and then must call the Special Conditions Coordinator at the Prometric Candidate Services Contact Center at the toll free number listed on their scheduling permit. Local centers may not schedule appointments for candidates requiring test accommodations.

section v: EXAM PREPARATION

1. Exam Preparation Disclaimer

Exam candidates should be aware that the IBHRE exams are not written according to any single text. 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. Due to its relationship with the Heart Rhythm Society, IBHRE promotes the HRS Online Self-Assessment program on its website, but does not endorse it as the sole recommended resource for exam preparation. Completing the HRS Online Self-Assessment does not guarantee success on the exam. A list of independent pacing and EP training programs can be found at www.IBHRE.org. 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.

2. Exam Preparation 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.
- Study pertinent articles in *PACE (Pacing and Clinical Electrophysiology)* and *JCE (Journal of Cardiac Electrophysiology)*.
- Seek out articles concerning arrhythmias (particularly review articles) in major cardiology journals from over the past two decades. Clinical documents can be accessed on the HRS website at <http://www.hrsonline.org/Practice-Guidance/Clinical-Guidelines-Documents>
- Review the **Exam Content Outline** for a comprehensive outline 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 and the functionality of the computerized caliper and calculator tools.

3. Recommended Reading Lists

Recommended texts can be found at on IBHRE's website. These lists are not exclusive as other texts may also prove useful for the purpose of exam preparation. IBHRE does not imply that all texts should be consulted in preparation for the exam, and familiarity with any or all of the texts does not guarantee successful completion of the exam. These texts are subject to change; for an up-to-date list of recommended readings, IBHRE encourages you to visit <http://www.ibhre.org/Exam-Preparation/Study-Guide>.

4. IBHRE Endorsed Study Tools

IBHRE endorses programs and products from approved providers to fulfill its mission of improving the quality of knowledge of heart rhythm professionals.

For examinees and certified professionals, endorsed partners provide access to live trainings, online educational programs, exam preparation materials, and fulfills IBHRE's Verification of Continuing Education Requirements.

5. Computer-Based Testing Tutorials

The 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 15 minutes to complete the tutorial before 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 <http://www.ibhre.org/Exam-Preparation/Computer-Based-Testing-Tutorials>. Exam candidates are welcome to download the tutorial to their computers to become familiar with the exam format before exam day. The tutorial also provides sample questions from each exam.

Personal computers should meet the following system and software requirements in order to successfully download the tutorials for the CCDS Exam and the CEPS (Allied Professional) 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

6. Online Information Resources

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

section vi: EXAM DAY

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 an electronic or hard copy of their scheduling permit (not applicable for CEPS–Adult or CEPS–Pediatric exam candidates) and an unexpired government- issued ID that includes both a signature and a recent photograph.

Physician CEPS exam candidates will not be required to have a scheduling permit or CIN number to enter the testing site. Proper identification will be required, however.

Acceptable forms of identification include:

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

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 scheduling permit and/or Prometric confirmation email. Candidates whose ID names do not match the name on these forms will not be permitted to test. Candidates are reminded to check their permits 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.

Candidates will then be instructed to write their name and Candidate Identification Number (CIN) shown in the box at the top of the permit. Test center staff will collect the Scheduling Permit and retain it at the Test Center Administrator's station. Candidates may request access to the permit during the examination if it becomes necessary to rewrite the CIN on the laminated writing surface. In addition to the laminated writing surfaces, candidates will be provided with dry-erase markers and an eraser. Test center staff will escort candidates to their assigned testing station and provide brief instructions on use of the computer equipment.

2. Testing Session

Every exam candidate is allotted five hours for the entire exam session. The CCDS exam consists of five sections containing 40 questions each. Examinees have a maximum of 54 minutes to complete each section. The Physician CEPS exams consist of four sections containing 44 questions each. Physician CEPS examinees will have a maximum of 60 minutes to complete each section. While still in the current section, all examinees can review past questions, but may not return to a section once it is complete. Once an examinee has completed a section, they may proceed to the next section or take a scheduled break.

Examinees are given 15 minutes to take an optional Computer-Based Testing (CBT) tutorial prior to the exam and a total of 15 minutes of optional break time. Any unused time remaining from the CBT tutorial may be used as optional break time throughout the scheduled exam appointment.

Examinees do not need to have computer

experience to use CBT. All examinees are encouraged to take the introductory tutorial that will instruct each examinee how to use the computer to answer questions and review responses. A test center administrator is always available to answer questions about using the computer.

3. Break Time

The entire testing session is scheduled for five hours. The computer keeps track of overall time and the time allocated for each block of the test. At the start of the testing session, examinees have a total of 15 minutes of optional break time. This allotment of time is used for authorized breaks between blocks and is also used to make transitions between items and between blocks. Authorized breaks include any time taken between test blocks, whether an examinee takes a brief break at their seat or they leave the testing room. If an examinee completes the tutorial or other blocks of the test early, the remaining time may be used as extra time to complete the candidate survey at the end of the test. The time may not be used to complete other blocks of the test. **IBHRE strongly recommends that candidates stay within their 15 minutes of authorized break time and utilize the rest of their time toward completing the exam.**

As examinees progress through the blocks of the test, they should use the features available in the testing software to monitor how many blocks are remaining and how much break time is remaining. The Day Time Remaining timer tracks the time available for the entire exam session (five hours). This timer starts at the beginning of the exam with the optional tutorial and ends once the five-

hour time allotment has expired. The Day Time Remaining timer does not stop and restart, but continues to run even during break time. The Block Time Remaining timer tracks the time available for the individual exam section. Examinees should be aware that the Block Time Remaining timer is not configured to keep track of unauthorized breaks. If an examinee takes too much break time and exceeds the allocated or accumulated break time, their time to complete the last block(s) in the testing session will be reduced. Examinees who lose testing time due to unauthorized breaks may risk being unable to complete the exam. **IBHRE does not, under any circumstances, provide additional time to examinees that are unable to complete exam questions as a result of losing time due to unauthorized breaks.** Examinees should keep track of the number of blocks completed and the number remaining.

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 exam is completed or time runs out for each block during the test, examinees must respond when the computer asks them to indicate whether they want to take a break or continue. After the test concludes, examinees may be asked to complete a survey about their testing experience.

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 Prometric 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. A laminated note board, dry-erase markers and an eraser are provided at the test center. These materials may not be removed from the test center. 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 Prometric 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 Prometric 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.

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. IBHRE encourages all exam candidates to take time to complete the survey.

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 will be 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.

7. Complaints

Candidates with complaints or comments about test center facilities, supervision, examination content or any other matter related to the testing program should complete the comment form at the test center and submit the [IBHRE Complaint Form](#).

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

1. Exam Results:

Exam results are available approximately 12 weeks following the test administration. Official results are released by IBHRE directly to the candidate in the form of an official score report. 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.

Official results documents for CCDS Exam and Allied Professional CEPS Exam candidates will be able to view their score reports online via a secure link provided to them via email. Physician CEPS exam candidates will view their pass/fail results on the IBHRE website prior to the distribution of score reports. 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.

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 addressed to the IBHRE staff at Info@ibhre.org.

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 new certified professionals are added to the IBHRE website after results have been distributed.

3. Certificates

Each candidate who receives a passing score will receive a 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.

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.

5. Retaking the Exam

IBHRE recommends that failing candidates pursue further education and study in the sections in the Exam Content Outline in which they performed below competence. 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.

6. Name Change Requests

All IBHRE examination candidates receive official notices and scheduling permits addressed to the name that appears on their application. In the event a candidate must request a new scheduling permit 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:

1. Significant error in the spelling or display of the candidate's name is cited in the database
2. Candidate reports a recent change in name due to marriage or divorce prior to the exam date
3. 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

1. IBHRE Code of Ethics

The purpose of the Code of Ethics for IBHRE Certified Professionals policy is to communicate the International Board of Heart Rhythm Examiner'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.

I. IBHRE Code of Ethics

The International Board of Heart Rhythm Examiners 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.

II. 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

III. 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

IV. Sanctions

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

- A. Present and/or future denial of initial certification or recertification
- B. 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
- C. 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

V. 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.

2. Impartiality Statement & Candidate Confidentiality

Impartiality Statement

IBHRE is accredited by the American National

Standards Institute (ANSI), a widely acknowledged personnel certification accreditation body in the United States. 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. The accreditation signifies to our certified professionals, exam candidates, and the medical community that the IBHRE program adheres to the highest standards in credentialing.

The International Board of Heart Rhythm Examiners (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 disabled 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 our 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 our certification process.

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 HRS employees. 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.

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.

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 International Board of Heart Rhythm Examiners. To review a complete policy regarding the use of licensed marks, please refer to the IBHRE website: www.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 your 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 Cardiology*
- *Certification Examination for Competency in Electrophysiology for the Physician-Pediatric Cardiology*

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)
Note: May be abbreviated as CEPS-A

- Certified Electrophysiology Specialist–Pediatric (Physician)

Note: May be abbreviated as CEPS-P

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 www.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 pertain 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.

Challenges Fulfilling Certification Requirements

Certified individuals must inform IBHRE, within 30 days, of matters that can affect the capability of their ability to fulfill the certification requirements. Specify name, certification issue, and the implications as it relates to your certification. Email IBHRE's Executive Director. Each submission will be handled on a case-by-case basis. You will be notified within 30 days with a response from IBHRE.

E. Verification of Continuing Education (VCE) and Recertification

The International Board of Heart Rhythm Examiners (IBHRE) competency certification examinations have long served as a benchmark for professional excellence and its recertification program promotes enhancement of the knowledge and skills essential to the delivery of optimal patient care through career-long learning and reexamination. Due to significant advances that continue to be made in cardiac pacing, defibrillation and electrophysiology, it is essential for physicians and allied professionals to maintain and demonstrate continued competency in their respective field, to ensure a high standard in treatment of patients. IBHRE recognizes continued competency of its certified professionals through evidence of the following activities:

- Ongoing participation in professional development activities (e.g. Completion of CME/ CE credit)
- Maintaining good standing and involvement in the heart rhythm management field
- Successful reexamination every ten years

VCE Requirements:

Five years after passing the exam, certified professionals must also attest to having completed 45 contact hours of professional development activities (e.g. CME/CE credits) that are applicable to their IBHRE certification. Candidates who have not met the VCE requirement will not be approved to take the exam to recertify. VCE activities may be submitted through www.ibhre.org via PDF or online form (available in early 2014). VCE submission is due December 1 of the 5th year of certification (five years after exam date).

Recertification Requirements:

10 years after passing the exam, certified professionals must recertify through reexamination. Candidates must also attest that they are currently active and involved in the field of cardiac rhythm management and that they remain in good standing within the medical community. Candidates who do not meet these requirements will lapse in their certification.

Recertification candidates must retake their respective certification examination by the year they are due to recertify.

All IBHRE candidates have a recertification due date of December 1 of the year they are due to recertify. Certified professionals who do not retake the exam or request an extension by December 1 will lose their credential and will be removed from the certified professional listing on the IBHRE website. Since certification exam administrations occur once per year for each certification exam, certified professionals may request a one-year extension.

Recertification candidates who are unable to take the exam in their respective exam year may receive an extension for the following year if they:

- Submit a request in writing for an extension at least 30 days prior to December 1
- Apply for the following year's exam by the appropriate deadline

Candidates who receive extensions will continue to have the same recertification cycle upon passing the exam. For example, a candidate due to recertify in 2010 who passes the exam in 2011 will still be due to recertify in 2020.

Candidates who choose not to recertify or do not pass the examination will no longer be permitted to use the IBHRE credential or designation. The names of candidates who lapse in their certification will be removed from the website. Recertification candidates who have been granted extensions may still refer to themselves as certified until their extension expires.

E. Verification Requests

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.

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.

- E. 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:
 - A. IBHRE official records including signed agreements submitted by candidate or certified professional
 - B. Archived records created and housed by IBHRE's contracted testing vendor
 - C. Relevant information requested from the employer of the candidate or certified professional
 - D. 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
 - E. 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 may 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.
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sectionix: ADDITIONAL INFORMATION

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.

2. Limited Liability

Neither IBHRE, NBME nor PROMETRIC (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.

3. Non-Discrimination

The International Board of Heart Rhythm Examiners 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 International Board of Heart Rhythm Examiners 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.

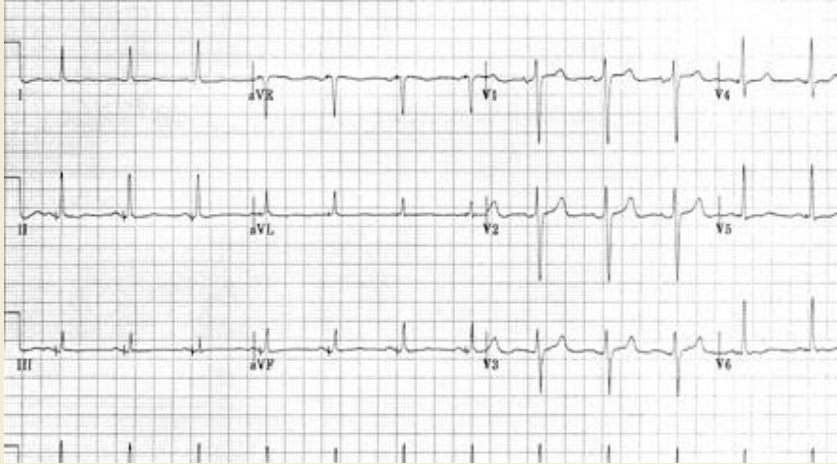
4. Contact Information

Mailing Address:

International Board of Heart Rhythm Examiners
1325 G St. NW Suite 400
Washington DC 20005
Telephone: 202-464-3414
Fax: 877-386-1044
E-mail: Info@ibhre.org
Website: www.IBHRE.org

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?

- (E) Shorten the AV delay
- (B) Test atrial capture threshold
- € Test atrial sensing
- (D) Test ventricular capture threshold
- € 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, 40asix, 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?

- (E) Add amiodarone and retest
- (B) Add digoxin
- € Add a sudden onset discriminator
- (D) Disable ATP, leave as 1 zone device
- € Increase ATP to 8 attempts with a ramp protocol and retest

Answer: A



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