

Clinical Cardiac Electrophysiology

Certification Examination Blueprint

Purpose of the exam

The exam is designed to evaluate the knowledge, diagnostic reasoning, and clinical judgment skills expected of the certified clinical cardiac electrophysiologist in the broad domain of the discipline. The ability to make appropriate diagnostic and management decisions that have important consequences for patients will be assessed. The exam may require recognition of common as well as rare clinical problems for which patients may consult a certified clinical cardiac electrophysiologist.

Exam content

Exam content is determined by a pre-established blueprint, or table of specifications. The blueprint is developed by ABIM and is reviewed annually and updated as needed for currency. Trainees, training program directors, and certified practitioners in the discipline are surveyed periodically to provide feedback and inform the blueprinting process.

The primary medical content categories of the blueprint are shown below, with the percentage assigned to each for a typical exam:

Medical Content Category	% of Exam
Basic Physiology, Anatomy, Pharmacology, and Genetics	20%
Clinical Arrhythmias: Core Concepts	5%
Clinical Arrhythmias: Bradycardias	5%
Clinical Arrhythmias: Atrial	12%
Clinical Arrhythmias: Supraventricular Tachycardias	15%
Clinical Arrhythmias: Ventricular	15%
Devices	20%
Clinical Scenarios and Syndromes	8%
	100%

Exam questions in the content areas above may also address clinical topics in general internal medicine as encountered in the practice of clinical cardiac electrophysiology (including some general pediatrics with an emphasis on adolescent medicine).

Exam format

The exam is composed of multiple-choice questions with a single best answer, predominantly describing clinical scenarios. Questions ask about the work done (that is, tasks performed) by physicians in the course of practice:

- Making a diagnosis
- Ordering and interpreting results of tests
- Recommending treatment, performing ablation, or other patient care
- Assessing risk, determining prognosis, and applying principles from epidemiologic studies
- Understanding the underlying pathophysiology of disease and basic science knowledge applicable to patient care

Clinical information presented may include pictorial material, radiographs, electrocardiograms, echocardiograms, venograms, fluoroscopy images, and other media to illustrate relevant patient findings.

A tutorial including examples of ABIM exam question format can be found at <http://www.abim.org/certification/exam-information/clinical-cardiac-electrophysiology/exam-tutorial.aspx>.

The blueprint can be expanded for additional detail as shown below. Each of the medical content categories is listed there, and below each major category are the content subsections and specific topics that *may* appear in the exam. Please note: actual exam content may vary.

Basic Physiology, Anatomy, Pharmacology, and Genetics	20%
Cellular electrophysiology	4%
Action potentials	
Ion channels and currents	
Receptors	
Gap junctions	
Cardiac anatomy	<2%

Cardiac tissue physiology	10%
Refractory periods	
Neuronal control—sympathetic nervous system and catecholamines	
Atrioventricular (AV) and ventriculoatrial (VA) conduction delay and block	
Mechanisms of arrhythmias	
Electrical and structural remodeling	
Repolarization—dispersion and reserve	
Other physiologic phenomena (retrograde block, ACE inhibitors, fractionated electrograms, pseudonormalization)	
Pharmacology	4%
Pharmacokinetics	
Use and reverse use dependence	
Properties of antiarrhythmic agents	
Genetics	<2%
Ion channels	
Non-ion channels	
Clinical Arrhythmias: Core Concepts	5%
Recognition of artifact	<2%
Pacing, signal recording, and mapping systems (electrophysiology laboratory)	<2%
Noninvasive testing	<2%
Indications	
Tilt-table testing	
Interpretation of wide QRS tachycardias	
Ambulatory electrocardiographic monitoring	
Invasive electrophysiologic testing	2%
Indications	
Interpretation	
Biophysics of ablation	<2%
Transseptal catheterization and pericardial access	<2%
Cardiac and intracardiac imaging	<2%
Clinical Arrhythmias: Bradycardias	5%
Sinus node dysfunction	<2%
Electrocardiograms (ECGs) – monitoring and telemetry	
Invasive electrophysiologic studies	
AV block	3%
AV nodal block	
Infranodal AV block	

Escape and accelerated rhythms	<2%
ECGs – monitoring and telemetry	
Invasive electrophysiologic studies	

Clinical Arrhythmias: Atrial	12%
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Atrial fibrillation	5%
Mechanism and etiology	
ECGs – monitoring and telemetry	
Pharmacologic treatment	
Postoperative atrial fibrillation	
Stroke prevention	
Cardioversion	
Catheter ablation	
Surgical ablation	
AV junction ablation	
Atrial flutter	4%
ECGs – monitoring and telemetry	
Pharmacologic treatment	
Stroke prevention	
Cardioversion	
Cavotricuspid isthmus (CTI)–dependent atrial flutter	
Atypical right atrial flutter	
Atypical left atrial flutter	
Focal atrial tachycardias	3%
ECGs – monitoring and telemetry	
Pharmacologic treatment	
Catheter ablation	

Clinical Arrhythmias: Supraventricular Tachycardias	15%
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Accessory pathway syndromes	9%
ECGs – monitoring and telemetry	
Pharmacologic treatment	
Electrophysiologic studies in ventricular preexcitation	
Electrophysiologic studies in orthodromic AVRT (typical and atypical pathways)	
Electrophysiologic studies in antidromic AVRT (typical and atypical pathways)	
Ablation of accessory pathways	
Fasciculoventricular pathways	
Multiple pathways	

AV nodal reentry tachycardia (AVNRT)	5%
Typical AVNRT (ECGs, pharmacologic treatment, intracardiac recordings, and ablation)	
Atypical AVNRT (ECGs, pharmacologic treatment, intracardiac recordings, and ablation)	
Junctional tachycardias	<2%
ECGs – monitoring and telemetry	
Pharmacologic treatment	
Interpretation of electrophysiology recordings	
Ablation	
Multiple SVT mechanisms	<2%
ECGs – monitoring and telemetry	
Pharmacologic treatment	
Interpretation of electrophysiology recordings	
Ablation	

Clinical Arrhythmias: Ventricular	15%
ECGs and ambulatory monitoring	3%
Ambulatory monitor recordings	
ECG localization – premature ventricular complexes (PVC) and VT	
Core concepts	5%
Indications for invasive electrophysiologic studies	
Interpretation of intracardiac recordings	
Pharmacologic treatment	
Principles of entrainment	
Ventricular tachycardias and ischemic heart disease	3%
Physiology	
Endocardial ablation	
Epicardial ablation	
Arrhythmias in patients with a left ventricular assist device (LVAD)	
Hemodynamic support during ablation	
Ventricular tachycardias and nonischemic cardiomyopathy	<2%
Physiology	
Endocardial ablation	
Epicardial ablation	
Arrhythmias in patients with a left ventricular assist device (LVAD)	
Hemodynamic support during ablation	

Ventricular tachycardias and premature ventricular complexes and the normal heart	2%
Physiology	
Endocardial ablation	
Epicardial ablation	
Ventricular fibrillation and polymorphic ventricular tachycardias	<2%
Physiology	
ECGs – monitoring and telemetry	
Pharmacologic treatment	
Bradycardia-dependent	
Drug-induced	
Ischemic	
Indications for invasive electrophysiologic studies	
Ablation	

Devices	20%
General concepts	<2%
Electromagnetic interference	
Biophysics and bioengineering	
Lead extraction	
Infection	
Automatic external and wearable defibrillators	
Pacemakers	6%
Indications	
Implantation techniques	
Programming and follow-up	
Complications	
Leadless pacing	
Implantable cardioverter-defibrillator (ICD) therapy	7%
Indications	
Implantation techniques	
ECGs – monitoring and telemetry	
Programming	
Follow-up	
Complications	
Subcutaneous implantable defibrillator	
Cardiac resynchronization	5%
Indications	
Implantation techniques	

ECGs – monitoring and telemetry	
Programming	
Leads	
Follow-up	
Complications	
Insertable loop recorders	<2%

Clinical Scenarios and Syndromes	8%
Common scenarios	2%
Syncope	
Palpitations	
Sudden cardiac death	
Ethics	
Specific syndromes	6%
Long QT syndrome	
Brugada syndrome	
Catecholaminergic polymorphic VT	
Hypertrophic cardiomyopathy	
Arrhythmogenic right ventricular cardiomyopathy	
Dilated cardiomyopathy	
Sarcoidosis	
Other arrhythmia substrates (musculoskeletal, short QT syndrome, early repolarization syndrome)	
Arrhythmias in pregnancy	
Arrhythmias in athletes	
Congenital heart disease	

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