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:

<table>
<thead>
<tr>
<th>Medical Content Category</th>
<th>% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Physiology, Anatomy, Pharmacology, and Genetics</td>
<td>20%</td>
</tr>
<tr>
<td>Clinical Arrhythmias: Core Concepts</td>
<td>5%</td>
</tr>
<tr>
<td>Clinical Arrhythmias: Bradycardias</td>
<td>5%</td>
</tr>
<tr>
<td>Clinical Arrhythmias: Atrial</td>
<td>12%</td>
</tr>
<tr>
<td>Clinical Arrhythmias: Supraventricular Tachycardias</td>
<td>15%</td>
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<tr>
<td>Clinical Arrhythmias: Ventricular</td>
<td>15%</td>
</tr>
<tr>
<td>Devices</td>
<td>20%</td>
</tr>
<tr>
<td>Clinical Scenarios and Syndromes</td>
<td>8%</td>
</tr>
<tr>
<td><strong>100%</strong></td>
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</tbody>
</table>
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](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.

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**Basic Physiology, Anatomy, Pharmacology, and Genetics  20%**

<table>
<thead>
<tr>
<th>Cellular electrophysiology</th>
<th>4%</th>
</tr>
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<tbody>
<tr>
<td>Action potentials</td>
<td></td>
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<tr>
<td>Ion channels and currents</td>
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<tr>
<td>Receptors</td>
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<tr>
<td>Gap junctions</td>
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</tbody>
</table>

**Cardiac anatomy**  <2%

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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
- ECGs – monitoring and telemetry
- Invasive electrophysiologic studies

Clinical Arrhythmias: Atrial 12%

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%

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

- Physiology
- Endocardial ablation
- Epicardial ablation

Ventricular fibrillation and polymorphic ventricular tachycardias

- Physiology
- ECGs – monitoring and telemetry
- Pharmacologic treatment
- Bradycardia-dependent
- Drug-induced
- Ischemic
- Indications for invasive electrophysiologic studies
- Ablation

### Devices

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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<tbody>
<tr>
<td><strong>General concepts</strong></td>
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<tr>
<td>Electromagnetic interference</td>
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<tr>
<td>Biophysics and bioengineering</td>
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<tr>
<td>Lead extraction</td>
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<tr>
<td>Infection</td>
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<tr>
<td>Automatic external and wearable defibrillators</td>
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<tr>
<td><strong>Pacemakers</strong></td>
<td>6%</td>
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<tr>
<td>Indications</td>
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<tr>
<td>Implantation techniques</td>
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<tr>
<td>Programming and follow-up</td>
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<tr>
<td>Complications</td>
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<td>Leadless pacing</td>
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<tr>
<td><strong>Implantable cardioverter-defibrillator (ICD) therapy</strong></td>
<td>7%</td>
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<tr>
<td>Indications</td>
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<tr>
<td>Implantation techniques</td>
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<td>ECGs – monitoring and telemetry</td>
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<td>Follow-up</td>
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<td>Complications</td>
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<td>Subcutaneous implantable defibrillator</td>
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<tr>
<td><strong>Cardiac resynchronization</strong></td>
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<tr>
<td>Indications</td>
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<tr>
<td>Implantation techniques</td>
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</table>
ECGs – monitoring and telemetry
Programming
Leads
Follow-up
Complications

**Insertable loop recorders**

<table>
<thead>
<tr>
<th>Clinical Scenarios and Syndromes</th>
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<tbody>
<tr>
<td><strong>Common scenarios</strong></td>
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<tr>
<td>Syncope</td>
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<tr>
<td>Palpitations</td>
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<td>Sudden cardiac death</td>
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<tr>
<td>Ethics</td>
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<tr>
<td><strong>Specific syndromes</strong></td>
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<tr>
<td>Long QT syndrome</td>
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<td>Brugada syndrome</td>
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<tr>
<td>Catecholaminergic polymorphic VT</td>
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<tr>
<td>Hypertrophic cardiomyopathy</td>
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<td>Arrhythmogenic right ventricular cardiomyopathy</td>
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<td>Dilated cardiomyopathy</td>
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<td>Sarcoidosis</td>
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<tr>
<td>Other arrhythmia substrates</td>
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<td>Arrhythmias in pregnancy</td>
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<td>Arrhythmias in athletes</td>
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<tr>
<td>Congenital heart disease</td>
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</table>

January 2021