**Advanced Heart Failure and Transplant Cardiology**  
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 advanced heart failure and transplant cardiology specialist 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 specialist in advanced heart failure and transplant cardiology.

**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>Heart Failure</td>
<td>60%</td>
</tr>
<tr>
<td>Mechanical Circulatory Support</td>
<td>15%</td>
</tr>
<tr>
<td>Heart Transplantation</td>
<td>20%</td>
</tr>
<tr>
<td>Pulmonary Hypertension</td>
<td>5%</td>
</tr>
</tbody>
</table>

Exam questions in the content areas above may also address clinical topics in general internal medicine that are relevant to the practice of advanced heart failure and transplant cardiology.
**Exam format**

The exam is composed of multiple-choice questions with a single best answer, predominantly describing patient 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 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

Some questions require interpretation of pictorial material, such as coronary angiograms, ultrasound images, computed tomograms, magnetic resonance images, electrocardiograms, and echocardiograms.


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.

### Heart Failure 60% of Exam

**Acute**

- New-onset
- Acute-on-chronic
- Shock
- Comorbidities

**Heart failure with reduced ejection fraction (HFrEF)**

- Stage A
- Stage B
- Stage C
- Stage D
- Comorbidities
- Transitional care
- Palliative care
Heart failure with preserved ejection fraction (HFpEF) 5%
  Stage A
  Stage B
  Stage C
  Stage D
  Comorbidities
  Transitional care
  Palliative care
Specific etiologies of heart failure 20%
  Adult congenital heart disease
  Arrhythmia-related
  Inherited cardiomyopathy
  Hypertension
  Hypertrophic cardiomyopathy
  Infiltrative cardiomyopathy
  Inflammation and infection
  Coronary artery disease and acute myocardial infarction
  Pericardial disease
  Peripartum cardiomyopathy
  Toxic cardiomyopathy
  Valvular heart disease

<table>
<thead>
<tr>
<th>Mechanical Circulatory Support</th>
<th>15% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient selection</strong></td>
<td>4%</td>
</tr>
<tr>
<td>Timing of referral</td>
<td></td>
</tr>
<tr>
<td>Comorbidities</td>
<td></td>
</tr>
<tr>
<td>Psychosocial circumstances</td>
<td></td>
</tr>
<tr>
<td>Hemodynamics</td>
<td></td>
</tr>
<tr>
<td><strong>Temporary circulatory assist devices</strong></td>
<td>4%</td>
</tr>
<tr>
<td>Percutaneous</td>
<td></td>
</tr>
<tr>
<td>Surgical</td>
<td></td>
</tr>
<tr>
<td>Extracorporeal membrane oxygenation</td>
<td></td>
</tr>
<tr>
<td><strong>Durable left ventricular assist devices</strong></td>
<td>6%</td>
</tr>
<tr>
<td>Thoratec HeartMate II ®</td>
<td></td>
</tr>
<tr>
<td>HeartWare HVAD ®</td>
<td></td>
</tr>
<tr>
<td><strong>Total artificial heart</strong></td>
<td>&lt;2%</td>
</tr>
</tbody>
</table>

Heart Transplantation 20% of Exam
  Patient selection <2%
  Timing of referral
Consent process
Comorbidities
Psychosocial circumstances
Hemodynamics

Listing criteria <2%
UNOS algorithms <2%
Registries <2%
Transplant immunology <2%
  Histocompatibility
  Allosensitization
  Immune response

Pre-operative considerations <2%
Intra-operative complications 2%
  Primary allograft dysfunction
  Right heart failure
  Indications for acute mechanical support
  Bleeding complications

Early peri-operative complications (< 7 days) <2%
Late peri-operative complications (7 – 28 days) <2%
Immunosuppression <2%
  Mechanisms of actions
  Adverse reactions
  Drug-drug interactions
  Protocols

Acute allograft rejection <2%
  Hyperacute
  Acute cellular
  Antibody-mediated rejection

Chronic allograft rejection <2%
  Allograft vasculopathy

Retransplantation <2%
  Patient selection
  Timing
  Complications

Post-transplantation considerations 3%
  Diabetes mellitus
  Hypertension
  Infection
  Malignancy
  Metabolic disorders
  Palliative care
  Pregnancy
  Psychosocial circumstances
  Rehabilitation
Renal dysfunction

<table>
<thead>
<tr>
<th>Pulmonary Hypertension</th>
<th>5% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO Group 1 – Pulmonary arterial hypertension (PAH)</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>WHO Group 2 – Pulmonary hypertension owing to</td>
<td></td>
</tr>
<tr>
<td>left heart disease</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>WHO Group 3 – Pulmonary hypertension owing to</td>
<td></td>
</tr>
<tr>
<td>lung disease</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>WHO Group 4 – Chronic thromboembolic pulmonary hypertension</td>
<td></td>
</tr>
<tr>
<td>(CTEPH)</td>
<td>&lt;2%</td>
</tr>
</tbody>
</table>

January, 2017