Transplant Hepatology Blueprint
Certification Examination (CERT)

Purpose of the exam

The exam, which is developed jointly by the ABIM and the American Board of Pediatrics, is designed to evaluate the knowledge, diagnostic reasoning, and clinical judgment skills expected of the certified transplant hepatologist 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 transplant hepatologist.

Exam content

Exam content is determined by a pre-established blueprint, or table of specifications, which 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>Pretransplant</td>
<td>45%</td>
</tr>
<tr>
<td>Perioperative</td>
<td>20%</td>
</tr>
<tr>
<td>Post-transplant</td>
<td>25%</td>
</tr>
<tr>
<td>Transplant Immunology</td>
<td>5%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

ABIM is committed to working toward health equity and believes that board-certified physicians should have an understanding of health care disparities. Therefore, health equity content that is clinically important to each discipline will be included in assessments, and the use of gender, race, and ethnicity identifiers will be re-evaluated.
Exam format

The exam is composed of up to 240 single-best-answer multiple-choice questions, predominantly describing patient scenarios. All candidates will see up to 180 common questions. ABIM candidates will see up to 60 additional questions specific to adult content areas; American Board of Pediatrics candidates will see up to 60 additional questions specific to Pediatric content areas. 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

Clinical information presented may include patient photographs, radiographs, electrocardiograms, recordings of heart or lung sounds, and other media to illustrate relevant patient findings. [Learn more information on how exams are developed.](http://www.abim.org/certification/exam-information/transplant-hepatology/exam-tutorial)

A tutorial including examples of ABIM exam question format can be found at [http://www.abim.org/certification/exam-information/transplant-hepatology/exam-tutorial](http://www.abim.org/certification/exam-information/transplant-hepatology/exam-tutorial).

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.

<table>
<thead>
<tr>
<th>Pretransplant</th>
<th>45% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Biliary atresia (pediatrics only)</strong></td>
<td>2%</td>
</tr>
<tr>
<td><strong>Genetic liver disease</strong></td>
<td>4%</td>
</tr>
<tr>
<td>Cholestatic syndromes (including progressive familial intrahepatic cholestasis [PFICs])</td>
<td></td>
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<tr>
<td>Hereditary hemorrhagic telangiectasia (internal medicine only)</td>
<td></td>
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<tr>
<td>Wilson disease</td>
<td></td>
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<tr>
<td>Alpha-1-antitrypsin deficiency</td>
<td></td>
</tr>
</tbody>
</table>
Iron overload syndromes
Mitochondrial defect
Urea cycle defect (pediatrics only)
Cystic fibrosis
Fibrocystic diseases (including Caroli disease and choledochal cysts)
Familial amyloid polyneuropathy (FAP) (internal medicine only)
Other genetic liver diseases (including EPP)

Autoimmune disorders
Primary biliary cholangitis (internal medicine only)
Hepatitis
Overlap syndrome (including autoimmune cholangiopathy)
Primary sclerosing cholangitis (including IgG4 cholangiopathy)
Sarcoidosis (internal medicine only)
Celiac disease

Viral hepatitis
Hepatitis A (HAV)
Hepatitis B (HBV)
Hepatitis C (HCV)
Hepatitis D (HDV)
Hepatitis E (HEV)
Other viruses (including EBV, CMV, HSV)

Budd-Chiari syndrome, sinusoidal obstruction syndrome, and congestive hepatopathy

Growth failure (pediatrics only)

Portal hypertension
Varices
Ascites
Encephalopathy
Spontaneous bacterial peritonitis
Noncirrhotic portal hypertension
Hepatic hydrothorax
Hepatopulmonary syndrome and portopulmonary hypertension
Hepatorenal syndrome

Liver tumors
Hepatocellular carcinoma
Hepatoblastoma (pediatrics only)
Cholangiocarcinoma (internal medicine only)
Other tumors (including benign, hemangioendothelioma, and neuroendocrine)

**Selection and evaluation for transplantation**

- Pediatric End-Stage Liver Disease (PELD) and Model for End-Stage Liver Disease (MELD) scoring systems, including psychosocial issues
- Contraindications to transplantation
- Exceptions to PELD and MELD systems
- Live donor selection
- Impact of active infection, malignancy, and malnutrition on outcome
- Multiorgan (liver, kidney) recipients
- Co-morbidities (including human immunodeficiency virus [HIV] infection)

**Acute liver failure**

- Epidemiology
- Etiology
- Pathobiology
- Assessment
- Prognostic indicators
- Treatment
- Indications for transplantation
- Outcome as a function of age and diagnosis

**Alcoholic liver disease (internal medicine only)**

- 2%

**Nonalcoholic fatty liver disease**

- <2%

**Liver diseases of pregnancy**

- <2%

**Transfer of care**

- <2%

**Drug-induced liver disease**

- <2%

**Perioperative**

- 20% of Exam

**Donor selection**

- 3%
  - Extended-criteria donors
  - Steatosis
  - Viral infection
  - Domino liver transplantation (internal medicine only)

**Surgical options, complications specific to graft and donor types (including ABO blood type)**

- 3%
Perioperative complications 6%
- Initial poor function or primary nonfunction
- Vascular complications
- Infections (viral, bacterial, and fungal)
- Hepatitis B and C antiviral therapy
- Biliary complications
- Allograft rejection
- Metabolic complications (including neurotoxicity and nephrotoxicity)

Drug hepatotoxicity 2%
Nutritional support 2%
Living donor <2%
- Small for size syndrome
- Donor complications
- Recipient complications

Donor transmission of disease <2%
Donation after cardiac death <2%
Split graft transplantation <2%

<table>
<thead>
<tr>
<th>Post-transplant</th>
<th>25% of Exam</th>
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</thead>
</table>

Immune complications 4%
- Rejection
- Graft-versus-host disease
- Alloimmune and autoimmune diseases (de novo)

Nonimmune complications 5%
- Diabetes mellitus
- Renal
- Bone
- Growth and development (pediatrics only)
- Cardiovascular complications
- Vascular complications

Infectious complications 5%
- Viral infections (cytomegalovirus, Epstein-Barr virus, and human herpesvirus)
- Bacterial infections
- Fungal infections
- Emerging infections
<table>
<thead>
<tr>
<th>Topic</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Recurrence of disease (including hepatitis C, cancer, PBC, AIH)</td>
<td>3%</td>
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<tr>
<td>Post-transplant malignancy</td>
<td>2%</td>
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<tr>
<td>Post-transplantation lymphoproliferative disorder (PTLD)</td>
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<tr>
<td>Surveillance for malignancy</td>
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<tr>
<td>Indications for retransplantation</td>
<td>2%</td>
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<tr>
<td>Adherence to medical regimen</td>
<td>2%</td>
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<tr>
<td>Quality of life</td>
<td>2%</td>
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<tr>
<td><strong>Transplant Immunology</strong></td>
<td><strong>5%</strong></td>
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<tr>
<td>Basic immunology</td>
<td>2%</td>
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<tr>
<td>Innate and adaptive immune system</td>
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<tr>
<td>Immune response</td>
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<td>Tolerance</td>
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<tr>
<td>Mechanism of action and pharmacokinetics (PK) of</td>
<td>2%</td>
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<tr>
<td>immunosuppressive medications</td>
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<tr>
<td>Cyclosporine and tacrolimus</td>
<td></td>
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<tr>
<td>Mycophenolate mofetil (MMF), mycophenolic acid (MPA), and azathioprine</td>
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<tr>
<td>Sirolimus and everolimus</td>
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<td>Antibody therapy</td>
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<td>Drug-drug interactions</td>
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<td>Corticosteroids</td>
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<tr>
<td>Short-term immune and nonimmune toxicity of</td>
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<tr>
<td>immunosuppressive medications</td>
<td>&lt;2%</td>
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<tr>
<td><strong>Miscellaneous</strong></td>
<td><strong>5%</strong></td>
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<tr>
<td>Statistics</td>
<td>2%</td>
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<tr>
<td>Kaplan-Meier (KM)</td>
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<tr>
<td>Cox proportional hazards</td>
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<tr>
<td>Relative risk</td>
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<td>Odds ratio</td>
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<td>Receiver operating characteristic curves</td>
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<tr>
<td>Ethics</td>
<td>2%</td>
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<tr>
<td>Psychosocial evaluation</td>
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<td>Living donor transplantation</td>
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<tr>
<td>Transplant tourism</td>
<td></td>
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<tr>
<td>Clinical trial participation</td>
<td></td>
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</tbody>
</table>
Managed care and reimbursement issues  
<2%  
Regulatory issues  
<2%  
Policy implications of organ shortage  
Regulation  

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