Transplant Hepatology
Maintenance of 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 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.

The exam is developed jointly by the ABIM and the American Board of Pediatrics. All candidates will see 180 common questions. ABIM candidates will see 60 additional questions specific to adult content areas; American Board of Pediatrics candidates will see 60 additional questions specific to Pediatric content areas. The following blueprint is used for determining the full exam for each of the two groups of examinees.

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>
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<tr>
<td>Transplant Immunology</td>
<td>5%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
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

Clinical information presented may include patient photographs, radiographs, histopathology, and other media to illustrate relevant patient findings.

Examinees will have access to an external resource (e.g., UpToDate®) for the exam. A tutorial including examples of ABIM exam question format can be found at https://www.abim.org/maintenance-of-certification/assessment-information/transplant-hepatology/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.

<table>
<thead>
<tr>
<th>Pretransplant</th>
<th>45% of Exam</th>
</tr>
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<tbody>
<tr>
<td>Biliary atresia (pediatrics only)</td>
<td>2%</td>
</tr>
<tr>
<td>Genetic liver disease</td>
<td>4%</td>
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<tr>
<td>Cholestatic syndromes (including progressive familial intrahepatic cholestasis [PFICs])</td>
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<tr>
<td>Hereditary hemorrhagic telangiectasia</td>
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<tr>
<td>(internal medicine only)</td>
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<tr>
<td>Wilson disease</td>
<td></td>
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<tr>
<td>Alpha-1-antitrypsin deficiency</td>
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<tr>
<td>Iron overload syndromes</td>
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<tr>
<td>Mitochondrial defect</td>
<td></td>
</tr>
<tr>
<td>Urea cycle defect (pediatrics only)</td>
<td></td>
</tr>
<tr>
<td>Cystic fibrosis</td>
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</tr>
<tr>
<td>Fibrocystic diseases (including Caroli disease and choledochal cysts)</td>
<td></td>
</tr>
</tbody>
</table>
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, veno-occlusive disease, 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 5%
  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%

<table>
<thead>
<tr>
<th>Perioperative</th>
<th>20% of Exam</th>
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<tbody>
<tr>
<td>Donor selection</td>
<td>3%</td>
</tr>
</tbody>
</table>
  - 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

- Small for size syndrome
- Donor complications
- Recipient complications

Donor transmission of disease <2%

Donation after cardiac death <2%

Split graft transplantation <2%

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**Post-transplant**

### Immune complications

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

### Nonimmune complications

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

### Infectious complications

- Viral infections (cytomegalovirus, Epstein-Barr virus, and human herpesvirus) 5%
- Bacterial infections
- Fungal infections
- Emerging infections

### Recurrence of disease (including hepatitis C, cancer, PBC, AIH)

- Recurrence of disease 3%

### Post-transplant malignancy

- Post-transplantation lymphoproliferative disease (PTLD) 2%
- Surveillance for malignancy

### Indications for retransplantation

- Adherence to medical regimen 2%
- Quality of life 2%

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**Transplant Immunology**

### Basic immunology

- Innate and adaptive immune system 2%
- Immune response
- Tolerance
Mechanism of action and pharmacokinetics (PK) of immunosuppressive medications

- Cyclosporine and tacrolimus
- Mycophenolate mofetil (MMF), mycophenolic acid (MPA), and azathioprine
- Sirolimus and everolimus
- Antibody therapy
- Drug-drug interactions
- Corticosteroids

Short-term immune and nonimmune toxicity of immunosuppressive medications

Miscellaneous 5% of Exam

Statistics 2%
- Kaplan-Meier (KM)
- Cox proportional hazards
- Relative risk
- Odds ratio
- Receiver operating characteristic curves

Ethics 2%
- Psychosocial evaluation
- Living donor transplantation
- Transplant tourism
- Clinical trial participation

Managed care and reimbursement issues <2%

Regulatory issues <2%
- Policy implications of organ shortage
- Regulation

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