**Hematology**  
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 hematologist 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 hematologist.

**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>Hematopoietic System</td>
<td>25%</td>
</tr>
<tr>
<td>Coagulation</td>
<td>27%</td>
</tr>
<tr>
<td>Hematologic Neoplastic Disorders</td>
<td>35%</td>
</tr>
<tr>
<td>Transfusion Medicine</td>
<td>5%</td>
</tr>
<tr>
<td>Hematopoietic Cell Transplantation (HCT)</td>
<td>8%</td>
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<tr>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Exam questions in the content areas above may also address topics related to pregnancy and contraception that are important to the practice of hematology (approximately 4% of the exam).
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, photomicrographs, 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/hematology/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>Hematopoietic System</th>
<th>25% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal hematopoiesis</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Disorders of red blood cells or iron</td>
<td>21%</td>
</tr>
<tr>
<td>Red blood cell production disorders</td>
<td>4%</td>
</tr>
<tr>
<td>Nutritional deficiencies</td>
<td></td>
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<tr>
<td>Iron deficiency</td>
<td></td>
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<tr>
<td>Nutritional anemia, non–iron deficiency</td>
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<tr>
<td>Anemia of chronic inflammation</td>
<td></td>
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<tr>
<td>Red cell aplasia and hypoplasia</td>
<td></td>
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<tr>
<td>Sideroblastic anemia</td>
<td></td>
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<tr>
<td>Red blood cell destruction disorders</td>
<td>15%</td>
</tr>
<tr>
<td>Thalassemias</td>
<td></td>
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<tr>
<td>Alpha thalassemia</td>
<td></td>
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<tr>
<td>Beta thalassemia</td>
<td></td>
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<tr>
<td>Hemoglobin E disorders</td>
<td></td>
</tr>
</tbody>
</table>
Sickle cell disorders 4.5%
   Sickle cell trait
   Sickle cell anemia (hemoglobin SS disease)
   Hemoglobin SC disease
   Sickle cell-β⁰ and sickle cell-β⁺-thalassemias
Non-sickle hemoglobinopathies
Autoimmune hemolytic anemias (AIHA)
   Warm antibody-mediated autoimmune hemolytic anemia
   Cold antibody-mediated autoimmune hemolytic anemia
   Drug-induced hemolysis
Metabolic abnormalities and enzyme deficiency hemolytic anemias
   Oxidant hemolysis, including glucose-6-phosphate dehydrogenase (G6PD) deficiency
   Pyruvate kinase deficiency and other metabolic deficiencies
Paroxysmal nocturnal hemoglobinuria
Red blood cell membrane disorders
   Microangiopathic hemolytic anemias
      (other than TTP, HUS, or DIC)
   Non-autoimmune, acquired hemolytic anemias
Erythrocytosis
Porphyrias
Hemochromatosis
White blood cell disorders <2%
   Granulocyte disorders
      Quantitative granulocyte disorders
      Qualitative granulocyte disorders
   Lymphocytopenia and lymphocyte dysfunction syndromes
   Leukocytosis
   Eosinophilia
   Hemophagocytic syndromes
Bone marrow failure syndromes 2%
   Aplastic anemia
      Inherited aplastic anemia
      Acquired aplastic anemia
   Pancytopenia
Platelet and megakaryocyte disorders 7%
Inherited disorders of platelet function
Acquired disorders of platelet function
  Drug-induced disorders
  Non-drug-induced disorders
Thrombocytopenia 4.5%
Inherited thrombocytopenia
Acquired thrombocytopenia
  Immune thrombocytopenic purpura (ITP)
  Drug-induced thrombocytopenia
  Thrombotic thrombocytopenic purpura (TTP)
  Hemolytic uremic syndrome (HUS)
  Thrombocytopenia secondary to liver disease and splenic disorders

Thrombocytosis

Hemostasis 10%
Molecular basis of coagulation and hemostatic agents
  Normal hemostasis
  Laboratory evaluation
  Hemostatic drugs
Inherited bleeding disorders (non-platelet) 6%
  Von Willebrand disease
    Types 1, 2A, 2M, 2N, and 3
    Type 2B
    Modifiers of von Willebrand factor levels
  Hemophilias A and B
    Hemophilia A
    Hemophilia B
  Factor XI deficiency
  Factor deficiencies other than factor XI
Inherited vascular abnormalities
Acquired bleeding disorders (non-platelet)
  Factor inhibitors
  Disseminated intravascular coagulation (DIC)
Acquired vascular abnormalities
Secondary acquired factor deficiencies
**Thrombosis**

10%

- Molecular basis of natural anticoagulants, fibrinolytic pathway, and anticoagulant therapy
  - Normal anticoagulant and fibrinolytic mechanisms
  - Laboratory evaluation
  - Anticoagulant drugs

**Thrombotic disorders**

4.5%

- Inherited thrombotic disorders
  - Factor V Leiden and prothrombin G20210A

- Deficiencies of natural anticoagulants
  - (antithrombin, proteins C and S)

- Hyperhomocysteinemia

Acquired thrombotic disorders

- Heparin-induced thrombocytopenia (HIT)
- Anti-phospholipid antibody syndrome (APS)
- Cancer-related thrombotic disorders

Thromboembolism at unusual sites

Thrombosis management (non-disease-specific)

Complications of thrombotic disorders

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**Hematologic Neoplastic Disorders**

35% of Exam

**Myeloproliferative neoplasms**

4.5%

- Chronic myeloid leukemia
- Polycythemia vera and secondary erythrocytosis
- Primary myelofibrosis
- Essential thrombocytemia
- Mastocytosis
- Chronic neutrophilic leukemia

**Acute leukemias and myelodysplasia**

8%

- Acute promyelocytic leukemia
- Acute myeloid leukemia (non-promyelocytic)
- Therapy-related myeloid neoplasms
- Myeloid sarcoma/extramedullary leukemia
- Myelodysplastic syndromes
- Chronic myelomonocytic leukemia and myelodysplastic/myeloproliferative neoplasm overlap syndromes
- B-cell acute lymphoblastic leukemia/lymphoma (B-ALL)
- T-cell acute lymphoblastic leukemia/lymphoma (T-ALL)
B-cell neoplasms 13%

Chronic lymphoid leukemias
- Chronic lymphocytic leukemia/small lymphocytic lymphoma
- Monoclonal B-cell lymphocytosis
- Hairy cell leukemia

Plasma cell neoplasms
- Multiple myeloma
- Plasmacytomas
- Amyloidosis
- Castleman disease and POEMS syndrome
  (polyneuropathy, organ enlargement, endocrinopathy,
  Monoclonal plasma-proliferative disorder, skin changes)
- Monoclonal gammopathy of undetermined significance (MGUS)

Non-Hodgkin lymphomas, B-cell 7%
- Diffuse large B-cell lymphoma
- Follicular lymphoma
- Mantle cell lymphoma
- Marginal zone B-cell and mucosa-associated lymphoid tissue (MALT) lymphomas
- Burkit lymphoma
- Primary central nervous system lymphoma
- Lymphoplasmacytic lymphoma (including Waldenström macroglobulinemia)
- General lymphoma issues (not specific to lymphoma type)

Immunodeficiency-associated lymphoproliferative disorders <2%
- Post-transplantation lymphoproliferative disorders (solid organ transplant)
- Lymphomas associated with human immunodeficiency virus (HIV) infection or primary immune disorders
- Lymphoproliferative disorders associated with iatrogenic immunodeficiency

T-cell and NK-cell neoplasms <2%
- Cutaneous T-cell lymphoma (mycosis fungoides and Sézary syndrome)
- T-cell lymphomas
- Adult T-cell leukemia/lymphoma
- Large granular lymphocyte leukemia
- Prolymphocytic leukemia
Hodgkin lymphoma  
  Classical Hodgkin lymphoma  
  Nodular lymphocyte-predominant Hodgkin lymphoma

Histiocytic and dendritic cell neoplasms  <2%

Myeloid and lymphoid neoplasms with eosinophilia and
  Abnormalities of PDGFRα, PDGFRβ, or FGFR1 <2%

Complications of hematologic malignancies <2%
  Tumor lysis syndrome
  Spinal cord compression
  Paraneoplastic disorders

Pharmacology  2.5%
  Toxicities and complications, including
cytopenic complications
  Drug dosing and dose modifications

Clinical trial design and interpretation <2%

<table>
<thead>
<tr>
<th>Transfusion Medicine</th>
<th>5% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical indications for the use of blood products</strong></td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Red blood cell preparations</td>
<td></td>
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<tr>
<td>Platelet preparations</td>
<td></td>
</tr>
<tr>
<td>Fresh frozen plasma</td>
<td></td>
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<tr>
<td>Cryoprecipitate</td>
<td></td>
</tr>
</tbody>
</table>

**Risks associated with blood products**  4%
  Risks associated with administration
    Allergic reactions
      Nonanaphylactic allergic reactions
      IgA deficiency
      Anaphylactic reactions
    Graft-versus-host disease
    Electrolyte disturbances
    Infectious organisms
    Alloimmunizations
    Transfusion reactions
      Hemolytic reactions
      Febrile reactions
      Transfusion-related acute lung injury (TRALI)
      Transfusion-associated circulatory overload (TACO)
    Post-transfusion purpura and other risks associated
      with administration
Risks associated with therapeutic apheresis procedures

Management of patients who refuse transfusion <2%

<table>
<thead>
<tr>
<th>Cellular Therapy</th>
<th>8% of Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hematopoietic cell biology and engraftment</strong></td>
<td>&lt;2%</td>
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<tr>
<td>Biology of hematopoietic cell transplantation</td>
<td></td>
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<tr>
<td>Biologic and immunologic relationship between donor and host</td>
<td></td>
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<tr>
<td><strong>Hematopoietic cell transplantation in the management of hematologic diseases</strong></td>
<td>2%</td>
</tr>
<tr>
<td>Autologous HCT</td>
<td></td>
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<tr>
<td>Allogeneic HCT</td>
<td></td>
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<tr>
<td><strong>Conditioning regimens</strong></td>
<td>&lt;2%</td>
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<tr>
<td>Regimen intensity</td>
<td></td>
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<tr>
<td>Toxicities</td>
<td></td>
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<tr>
<td><strong>Supportive care</strong></td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Preventing infectious disease</td>
<td></td>
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<tr>
<td>Transfusion support, including graft compatibility and blood product issues</td>
<td></td>
</tr>
<tr>
<td><strong>Graft-versus-host disease (GVHD)</strong></td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Acute GVHD</td>
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<tr>
<td>Chronic GVHD</td>
<td></td>
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<tr>
<td><strong>Other complications after hematopoietic cell transplantation</strong></td>
<td>&lt;2%</td>
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<tr>
<td>Engraftment failure or rejection</td>
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<tr>
<td>Infections</td>
<td></td>
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<td>Organ toxicity</td>
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<tr>
<td>Transplant-associated thrombotic microangiopathy</td>
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<tr>
<td>Post-transplant lymphoproliferative disorder</td>
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<tr>
<td>Late effects</td>
<td></td>
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<tr>
<td><strong>Disease relapse</strong></td>
<td>&lt;2%</td>
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<tr>
<td><strong>Chimeric antigen receptor (CAR) T-cell therapy and other genetically modified cell therapy</strong></td>
<td>&lt;2%</td>
</tr>
</tbody>
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July 2021