ABIM/ASCO Medical Oncology: Learning & Assessment
Hematologic Malignancies
Maintenance of Certification Assessment Blueprint

**Purpose of the assessment**
The assessment is designed to evaluate the knowledge, diagnostic reasoning, and clinical judgment skills expected of the certified medical oncologist. The ability to make appropriate diagnostic and management decisions that have important consequences for patients will be assessed.

**Assessment content**
Assessment content is determined by a pre-established blueprint, or table of specifications. The blueprint is developed by ABIM and ASCO 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 and secondary medical content categories of the blueprint are shown below, with the percentage assigned to each for a typical assessment:

<table>
<thead>
<tr>
<th>Medical Content Category</th>
<th>% of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hematologic Malignancies</td>
<td>75%</td>
</tr>
<tr>
<td>Leukemias</td>
<td>30%</td>
</tr>
<tr>
<td>Lymphoid malignancies</td>
<td>30%</td>
</tr>
<tr>
<td>Multiple myeloma and plasma cell dyscrasias</td>
<td>9%</td>
</tr>
<tr>
<td>Cellular therapy</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Medical Oncology Core</strong></td>
<td><strong>25%</strong></td>
</tr>
<tr>
<td>Anticancer therapeutics, clinical research methodology, and ethics</td>
<td>10%</td>
</tr>
<tr>
<td>Palliative care, survivorship, and communication</td>
<td>11%</td>
</tr>
<tr>
<td>Genetics, genomics, and tumor Biology</td>
<td>4%</td>
</tr>
</tbody>
</table>

*Medical Oncology Core content includes topics relevant to all medical oncologists, regardless of what disease(s) they focus on in practice.*
**Assessment format**
The assessment is composed of multiple-choice questions, predominantly describing patient scenarios. All questions will be in the single-best-answer format.

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

Clinical information presented may include patient photographs, radiographs, computed tomograms, photomicrographs, magnetic resonance images, an equianalgesic table, bone scans, family pedigree charts, nomograms, and other media to illustrate relevant patient findings.

A tutorial including examples of ABIM assessment question format can be found at http://www.abim.org/certification/exam-information/medical-oncology/exam-tutorial.aspx.

The blueprint can be expanded for additional detail as shown below. Each of the medical content categories is listed, and below each major category are the content subsections and specific topics that may appear in the assessment. Please note: actual assessment content may vary.

<table>
<thead>
<tr>
<th>Hematologic Malignancies</th>
<th>75% of Assessment</th>
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<tbody>
<tr>
<td><strong>Leukemias</strong></td>
<td>30%</td>
</tr>
<tr>
<td><strong>Acute leukemia and myelodysplasia</strong></td>
<td></td>
</tr>
<tr>
<td>Acute myeloid leukemia (AML)</td>
<td></td>
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<tr>
<td>Acute promyelocytic leukemia (APL)</td>
<td></td>
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<tr>
<td>AML with recurrent genetic abnormalities</td>
<td></td>
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<tr>
<td>AML with myelodysplasia-related changes</td>
<td></td>
</tr>
<tr>
<td>Therapy-related myeloid neoplasms</td>
<td></td>
</tr>
<tr>
<td>AML not otherwise specified</td>
<td></td>
</tr>
<tr>
<td>Myeloid sarcoma</td>
<td></td>
</tr>
</tbody>
</table>
Acute lymphoblastic leukemia
  B-cell acute lymphoblastic leukemia/lymphoma (B-ALL)
  T-cell acute lymphoblastic leukemia/lymphoma (T-ALL)
Myelodysplastic syndromes
Chronic myelomonocytic leukemia

**Chronic myeloid leukemia and myeloproliferative neoplasms**
  Chronic myeloid leukemia
  Myeloproliferative neoplasms
  Myeloid and lymphoid neoplasms with eosinophilia and abnormalities of PDGFRα, PDGFRβ, or FGFR1
  Chronic neutrophilic leukemia

**Lymphoid malignancies**
  Hodgkin lymphoma
    Classical Hodgkin lymphoma
    Nodular lymphocyte-predominant Hodgkin lymphoma
  Non-Hodgkin lymphoma
    Diffuse large B-cell lymphoma
    Follicular lymphoma
    Burkitt lymphoma
    Mantle cell lymphoma
    NK-T cell lymphoma
    Anaplastic large cell lymphoma
    Extranodal marginal zone lymphoma of mucosa-associated lymphoid tissue (MALT lymphoma)
    Nodal marginal zone lymphoma
    Human immunodeficiency virus (HIV)-associated lymphoma
    Human T-cell lymphotropic virus type 1-associated lymphoma (adult T-cell leukemia/lymphoma)
    Cutaneous T-cell lymphoma (mycosis fungoides and Sézary syndrome)
    Primary central nervous system lymphoma
    Post-transplantation lymphoproliferative syndromes
    Peripheral T-cell lymphoma
    Lymphoplasmacytic lymphoma (including Waldenström macroglobulinemia)

General lymphoma issues (not specific to lymphoma type)
  Lymphoproliferative disorders associated with iatrogenic immunodeficiency
  Chronic lymphoproliferative leukemias
    Chronic lymphocytic leukemia/small lymphocytic lymphoma
    Hairy cell leukemia
    T-cell prolymphocytic leukemia

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T-cell large granular lymphocytic leukemia
Monoclonal B-cell lymphocytosis

**Multiple myeloma and plasma cell dyscrasias** 9%
- Multiple myeloma/plasma cell leukemia
- Solitary plasmacytoma
- Primary amyloidosis
- Cryoglobulinemia
- Monoclonal gammopathy of undetermined significance (MGUS)

**Cellular therapy** 6%
- Autologous hematopoietic cell transplantation (HCT)
- Allogeneic HCT
- HCT Conditioning regimens
- Supportive care
- Graft-versus-host disease
- Other complications after HCT
  - Engraftment failure or rejection
  - Infections
  - Organ toxicity
  - Transplant-associated thrombotic microangiopathy
- Late effects
- Chimeric antigen receptor (CAR) T-cell therapy

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**Anticancer Therapeutics, Clinical Research Methodology, and Ethics** 10% of Assessment

*Note: The Hematologic Malignancies assessment will only test knowledge of drugs that are used to treat hematologic malignancies and their symptoms.*

**Principles of allied disciplines** <2%
- Surgical oncology
- Radiation oncology
- Interventional radiology
- Pathology

**Anticancer therapeutics** 7.5%
- Cytotoxic chemotherapy agents
  - Alkylating agents
  - Antimetabolites
  - Antitubulin agents
  - Anthracyclines
  - Topoisomerase I inhibitors
Topoisomerase II inhibitors
Bleomycin and other DNA-damaging agents

Chemotherapy-drug interactions

Hormonal therapies
Estrogens and selective estrogen response modifiers
Progestins and antiprogestins
Aromatase inhibitors
Androgens and antiandrogens
Gonadotropin-releasing hormone analogues
Glucocorticoids

Small molecule kinase inhibitors
BCR-ABL1 inhibitors
Epidermal growth factor receptor (EGFR) inhibitors
Vascular endothelial growth factor receptor (VEGFR)/multitargeted inhibitors
BRAF inhibitors
Anaplastic lymphoma kinase (ALK) and mesenchymal epithelial transition (MET) growth factor inhibitors
RET, ROS1, and NTRK inhibitors
Mitogen-activated protein kinase (MEK) inhibitors
Bruton tyrosine kinase (BTK) inhibitors
Janus kinase (JAK) inhibitors
Phosphoinositide-3 kinase (PI3K) inhibitors
Mammalian target of rapamycin (mTOR) inhibitors
Cyclin-dependent kinase (CDK) inhibitors

Agents with epigenetic activity
Histone deacetylase (HDAC) inhibitors
DNA methyltransferase inhibitors

Metabolic inhibitors other than antimetabolites
Monoclonal antibodies and antibody conjugates other than immune checkpoint inhibitors
Monoclonal antibodies targeting EGFR, HER2, HER3, HER4
Monoclonal antibodies targeting VEGFR pathway
Monoclonal antibodies targeting B cell antigens (including CD20)
Monoclonal antibodies targeting interleukin-6 (IL-6)
Bispecific monoclonal antibodies
Monoclonal antibody immune checkpoint inhibitors
   Agents targeting cytotoxic T-lymphocyte-associated antigen 4 (CTLA4)
   Agents targeting programmed cell death protein 1 (PD-1) and programmed cell death ligand 1 (PD-L1)
Tumor vaccines and viral-based immunotherapeutics
Cytokines
Agents with other novel or specific targets
   Proteasome inhibitors
   Immunomodulatory drugs (IMiDs)
   Hedgehog (Hh) inhibitors
   Poly(ADP-ribose) polymerase (PARP) inhibitors
   Arsenicals
Cellular therapeutics
   High-dose therapy with stem cell rescue (autologous and allogeneic)
   Chimeric antigen receptor (CAR) T-cell therapy

**Clinical research methodology and ethics** <2%

Clinical research methodology
   Design and interpretation of clinical trials
   Tumor assessment, imaging, and end points
   Surrogate end points

Ethics
   Human subjects and regulatory and legal issues
   Physician behavior and conflict of interest

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<tr>
<th>Palliative Care, Survivorship, and Communication</th>
<th>11% of Assessment</th>
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</thead>
<tbody>
<tr>
<td>Clinical manifestations of advanced cancer and its treatment</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

Cutaneous and mucosal manifestations
   Oral mucositis
   Rash
   Xerostomia

Endocrine manifestations

Gastrointestinal manifestations
   Ascites and peritoneal metastases
   Liver manifestations
   Constipation
   Diarrhea
   Nausea and vomiting
Bowel obstruction
Esophagitis
Dysphagia
Hematologic manifestations
Bleeding
Thrombosis
Cytopenia (Neutropenia)
Anemia
Transfusion reactions
Musculoskeletal manifestations
Neurologic manifestations
Spinal cord compression
Neuropathy
Increased intracranial pressure
Progressive multifocal leukoencephalopathy
Radiation-related toxicity
Renal, metabolic, and nutritional manifestations
Tumor lysis syndrome
Hypercalcemia
Hyponatremia
Nutritional support
Paraneoplastic syndromes
Cardiothoracic manifestations
Pleural and pericardial effusions
Pneumonitis
Dyspnea
Cough
Superior vena cava syndrome
Fatigue
Psychiatric manifestations
Depression
Anxiety
Delirium
Infectious risks and complications
Infections
Febrile neutropenia
Lymphedema
**Cancer pain** 2%
Use of opioids
Use of nonopioids

**Survivorship issues**
- Fertility and sexual health
- Second primary cancers
- Secondary cancer prevention
- Nonmalignant sequelae
- Surveillance

**End-of-life issues**
- Hospice
- Feeding and nutrition
- Decision making

**Procedure-related issues**
- Chemotherapy administration
- Bone marrow aspiration, biopsy, and interpretation
- Tumor assessment
- Thoracentesis
- Paracentesis
- Feeding tubes

**Communication**
- Communicating prognosis and other clinical information
- Discussing goals of care
- Discussing survivorship issues

### Genetics, Genomics, and Tumor Biology

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Cancer biology and genetics</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Tumor immunology</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Heritable cancer syndromes</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>Cancer epidemiology</td>
<td>&lt;2%</td>
</tr>
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</table>

Note: The Hematologic Malignancies assessment will only test knowledge of heritable cancer syndromes that are related to hematologic malignancies.

- **Cancer biology and genetics**
  - Carcinogenesis
  - Genomics

- **Tumor immunology**

- **Heritable cancer syndromes**
  - Li-Fraumeni syndrome (*TP53*)
  - *BRCA1* and *BRCA2* syndromes
  - Familial colorectal cancer
    - Familial adenomatous polyposis
    - Lynch syndrome (hereditary nonpolyposis colorectal cancer)
  - Multiple endocrine neoplasia and familial medullary thyroid cancer syndromes