

HEMATOLOGY 2019

American Society of Hematology
Education Program

61st ASH[®] Annual Meeting and Exposition
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Cover: T cells and brain cancer cell. The image is a composite colored scanning electron micrograph of T cells and an apoptotic brain cancer cell. T cells are a component of the body's immune system. Chimeric antigen receptor (CAR) T-cell therapy takes T cells from a cancer patient's blood and modifies them to recognize a specific protein found on the patient's tumor cells. When reintroduced into the patient, the T cells find and destroy the tumor cells. The newest form of CAR T-cell therapy, now in clinical trials, uses "memory" T cells, which remain in the body after attacking the cancer. The hope is that memory T cells may provide an active reservoir of cancer-killing cells capable of stopping further tumors. Magnification $\times 6000$ at 10 cm wide. Source: Steve Gschmeissner/Science Photo Library.

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Editors' Message

Welcome to the 61st annual meeting of the American Society of Hematology. We are delighted to provide you with Hematology 2019 as a means of memorializing and augmenting your educational experience. The Education Co-Chairs, Dr. Elisabeth Battinelli and Dr. Jason Gotlib, have prepared a state-of-the-art program that covers the breadth of malignant and nonmalignant hematology and highlights advances in the field from basic discovery and disease pathogenesis to clinical application at the bedside. This volume, which is also available online at <http://asheducationbook.hematologylibrary.org>, is the culmination of the efforts of many individuals and their selfless commitment to ASH including the authors, reviewers, and ASH staff (Joanna Robertson, Michelle Lee, and Kenneth April).

Professor Amit Nathwani will deliver the Ham-Wasserman Lecture on gene therapy for the treatment of hemophilia, and his article is also included.

It is a most exciting time in hematology. To assist you in keeping current with the torrid pace of progress in our field, we have attempted to highlight recent practice-changing clinical advances as well as to put cutting edge basic advances into clinical context. We hope that you will find Hematology 2019 to be a valuable resource.



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Continuing Medical Education Information

Hematology, the ASH Education Program, is an annual publication that provides practicing hematologists with invaluable information on the most important areas of clinical progress.

Hematology 2019 is a peer-reviewed collection of 86 articles written by the 2019 ASH Education Program speakers and the Ham-Wasserman Lecturer. The papers showcase groundbreaking advances and new concepts in nearly 30 different fields. Every year, the periodical provides an updated and comprehensive review of each of the topics covered in the annual meeting education sessions.

Educational objectives

1. Employ the knowledge gained regarding the diagnosis and treatment of malignant and nonmalignant hematologic disorders to improve patient care.
2. Discuss the state-of-the-art therapeutics in hematology.
3. Analyze the potential contribution of novel, not-yet-approved modalities of therapy to current evidence-based management of malignant and non-malignant hematologic disorders.

Date of release

December 2019

Date of expiration

On December 31, 2020, the ability to earn Continuing Medical Education credit and American Board of Internal Medicine Maintenance of Certification points for this product expires. This is the last date for users to claim credit for this product. For questions about credit, please contact the ASH Education Department at cme@hematology.org or call toll-free 866-828-1231 within United States only; +1-202-776-0544 internationally.



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The American Society of Hematology is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. The American Society of Hematology designates this enduring material for a maximum of 40 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Physicians who participate in this CME activity but are not licensed in the United States are also eligible for *AMA Category 1 PRA Credit™*.

To earn these credits, readers must take two online tests (malignant and non-malignant) based on chapters from the book.



ABIM Maintenance of Certification

Successful completion of this CME activity enables the participant to earn up to 40 MOC points in the American Board of Internal Medicine's (ABIM) Maintenance of Certification (MOC) program. Participants will earn MOC points equivalent to the amount of CME credits claimed for the activity. It is the CME activity provider's responsibility to submit participant completion information to ACCME for the purpose of granting ABIM MOC credit.

Claiming CME Credit and ABIM points

The estimated time to complete this educational activity is 40 hours. To claim CME credit, users must complete an evaluation of the product and a test of medical knowledge, both of which are accessed through the ASH Academy (www.ashacademy.org). There is a one-time processing fee for claiming CME/MOC credit. Users with scores of 80% or better on these self-assessment modules are eligible to claim credit for the activity.

To facilitate claiming of credit, the test for this product is divided into two subtests, one of which focuses on malignant hematology content with the other focusing on non-malignant content. Successful completion of each test earns the user 20 *AMA Category 1 PRA Credits™*. *Users claim CME and/or ABIM MOC credit for each test individually.* You can take one or both tests, depending on your CME and MOC needs.

Each test consists of 25 questions. The 25 questions can be answered in one sitting, or a user can answer some questions, save their progress, and complete the test at a later time.

The Malignant Hematology Test covers information presented in the following sections:

- Acute Lymphoblastic Leukemia: Aiming High to Keep MRD Low, or Even Better, Negative
- Aggressive Non-Hodgkin Lymphomas: It's Getting Personal

- Challenges in Myeloma Therapy
- Expanding Horizons for Immunotherapy in Pediatric Leukemia
- Hodgkin Lymphoma: Celebrating 200 Years since Thomas Hodgkin Entered Medicine
- Immunotherapy in Myeloma
- Indolent Lymphomas: The Marathon Has a New Course
- Myelodysplastic Syndromes: From Mild-Mannered to Lurking Leukemia
- Myeloproliferative Neoplasms: Managing the Cup that Runneth Over
- Patients, Borders, Money, and Mission: A Global Perspective of Chronic Myeloid Leukemia
- Response Comes of Age in Chronic Lymphocytic Leukemia
- Spoiled for Choice: Donor Selection for Allogeneic Stem Cell Transplantation
- Therapy of Acute Myeloid Leukemia: Adapting to Change
- Why Patients Fail after Allogeneic Stem Cell Transplantation

The Nonmalignant Hematology Test covers information presented in the following sections:

- Aging and Hematologic Disorders: Exploring the Evidence
- Bone Marrow Failure and Clonal Evolution
- Coagulation Conundrum Roundtable: Case-Based Discussion on the Implications of Exogenous Estrogens in Hemostasis and Thrombosis
- Combined Basic Science and Education Session on Cancer-Associated Thrombosis
- DOACs in the Real World
- Inflammation and Hematopoiesis: The Impact of Inflammation on the Bone Marrow Microenvironment
- Iron: How to Manage When There is Too Much or Too Little of It
- Management of Sickle Cell Disease Complications Beyond Acute Chest
- New Diagnostic and Treatment Strategies for Antiphospholipid Syndrome
- Primary Immunodeficiencies for the Hematologist: Finding the Needle in the Haystack
- Sickle Cell Disease in Young and Old: A Time for Re-Evaluation
- Transfusion Medicine: Optimizing Patient Blood Management (PBM)
- What's New in the Diagnosis and Management of von Willebrand Disease?