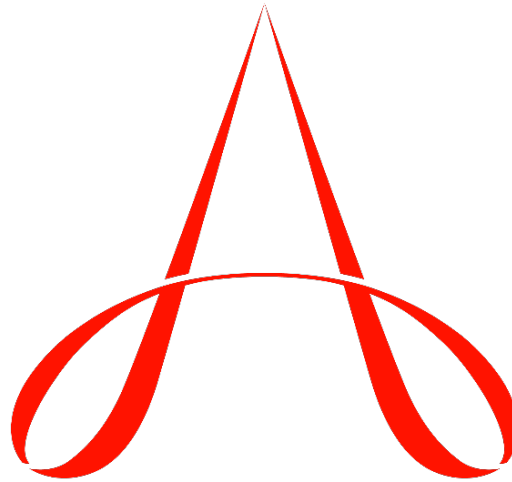




Supplemental Guide: Pediatric Hematology-Oncology



A C G M E

April 2023

TABLE OF CONTENTS

INTRODUCTION	3
PATIENT CARE	4
History and Physical Examination	4
Organize and Prioritize Patient Care	6
Clinical Reasoning	8
Patient management	10
Competence in Procedures	13
MEDICAL KNOWLEDGE	15
Oncology	15
Hematology	17
Bone Marrow Transplant/Cellular Therapy	19
Diagnostic Evaluation	21
SYSTEMS-BASED PRACTICE	23
Patient Safety	23
Quality Improvement	25
System Navigation for Patient-Centered Care – Coordination of Care	27
System Navigation for Patient-Centered Care – Transitions in Care	29
Population and Community Health	31
Physician Role in Health Care Systems	33
PRACTICE-BASED LEARNING AND IMPROVEMENT	35
Evidence-Based and Informed Practice	35
Reflective Practice and Commitment to Personal Growth	37
PROFESSIONALISM	39
Professional Behavior	39
Ethical Principles	42
Accountability/Conscientiousness	44
Well-Being	45
INTERPERSONAL AND COMMUNICATION SKILLS	47
Patient- and Family-Centered Communication	47
Interprofessional and Team Communication	49
Communication within Health Care Systems	52
Complex Communication Around Serious Illness	55
MAPPING OF 1.0 TO 2.0	57
RESOURCES	60

Milestones Supplemental Guide

This document provides additional guidance and examples for the Pediatric Hematology-Oncology Milestones. This is not designed to indicate any specific requirements for each level, but to provide insight into the thinking of the Milestone Work Group.

Included in this document is the intent of each Milestone and examples of what a Clinical Competency Committee (CCC) might expect to be observed/assessed at each level. Also included are suggested assessment models and tools for each subcompetency, references, and other useful information.

Review this guide with the CCC and faculty members. As the program develops a shared mental model of the Milestones, consider creating an individualized guide (Supplemental Guide Template available) with institution/program-specific examples, assessment tools used by the program, and curricular components.

Additional tools and references, including the Milestones Guidebook, Clinical Competency Committee Guidebook, and Milestones Guidebook for Residents and Fellows, are available at the end of this document as well as on the [Resources](#) page of the Milestones section of the ACGME website.

Patient Care 1: History and Physical Examination	
Overall Intent: To build upon those skills learned during pediatric residency and to address specialty-specific skills	
Milestones	Examples
Level 1 <i>Gathers a disease-specific history, with prompting</i> <i>Performs a physical examination standard for general pediatrics</i>	● Performs a routine history and physical exam on a patient with thrombocytopenia but does not take a bleeding history unless prompted ● Performs a routine history and physical exam on a patient receiving vincristine but fails to recognize the need to ask about constipation history or perform a neurological exam unless prompted
Level 2 <i>Accesses data from multiple sources and collects disease-specific history, including psychosocial history, with guidance</i> <i>Performs a disease-specific physical examination, with guidance</i>	● When prompted, reviews outside imaging and pathology in a patient referred for a second opinion ● When prompted, asks about access to food and transportation in a patient undergoing chemotherapy and coming to clinic multiple days a week ● Performs a physical exam on a patient receiving vincristine but requires assistance to perform a focused neurological exam to evaluate for foot drop
Level 3 <i>Accesses and synthesizes data from multiple sources and collects disease-specific history, with guidance</i> <i>Completes a disease-specific physical examination</i>	● Independently performs a history and examination on a patient with a pancytopenia that includes assessment of peripheral blood smear, prior blood counts, family history of hematologic illness, exposures, and prior treatments, but sometimes misses important details ● Independently performs a history and examination on a patient, including medical record review, but gathers all medical records and has difficulties sorting out the relevant information without assistance ● Independently but inconsistently performs a physical exam on patients receiving vincristine, including a focused neurological exam to evaluate for foot drop
Level 4 <i>Independently accesses and synthesizes data from multiple sources and collects disease-specific history</i> <i>Consistently completes a disease-specific physical examination</i>	● Consistently and efficiently obtains patient history and reviews relevant data for a patient with pancytopenia that includes assessment of peripheral blood smear, records of prior blood counts, asking about family history of hematologic illness, exposures, and prior treatments ● Consistently performs a physical exam on patients receiving vincristine, including a focused neurological exam to evaluate for foot drop
Level 5 <i>Role models gathering and synthesis of clinical information</i>	● Consistently discerns the most important history and physical exam findings to efficiently assess the patient ● Coaches residents or junior fellows on performing a physical exam on a patient receiving vincristine, including a focused neurological exam to evaluate for foot drop

Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Multisource evaluations • Objective Structured Clinical Examination (OSCE) • Simulation
Curriculum Mapping	•
Notes or Resources	• Allen-Rhoades, W., and C.P. Steuber. 2016. "Clinical Assessment and Differential Diagnosis of the Child with Suspected Cancer." in <i>Principles and Practice of Pediatric Oncology</i>, 7th ed., by Philip A. Pizzo and David G. Poplack, 101-112. Philadelphia, PA: Lippincott Williams & Wilkins. • Bickley, Lynn S., and Peter G. Szilagyi. 2012. <i>Bates' Guide to Physical Examination and History-Taking</i>. 11th ed. Philadelphia, PA: Wolters Kluwer Health. • Coulehan, John L., and Marian R. Block. 2006. "Respect, Genuineness, and Empathy." in <i>The Medical Interview: Mastering Skills for Clinical Practice</i>, 21-44. Philadelphia, PA: FA Davis Company. • Lu, Karen H., Marie E Wood, Molly Daniels, Cathy Burke, James Ford, Noah D Kauff, Wendy Kohlmann, et al. 2014. "American Society of Clinical Oncology Expert Statement: Collection and Use of a Cancer Family History for Oncology Providers." <i>Journal of Clinical Oncology</i>. 32(8): 833-840. doi:10.1200/JCO.2013.50.9257.

Patient Care 2: Organize and Prioritize Patients Overall Intent: To organize and appropriately prioritize patient needs to optimize patient outcomes	
Milestones	Examples
Level 1 <i>Organizes patient care responsibilities by focusing on individual (rather than multiple) patients</i>	• Places orders for work-up on new patient with suspected leukemia but does not evaluate another patient awaiting admission for fever and neutropenia • While in clinic, goes to see next scheduled patient, who has hereditary spherocytosis and presents for routine follow up, instead of patient with sickle cell disease who is scheduled later but is having acute pain not responding to oral pain medication
Level 2 <i>Organizes and prioritizes the simultaneous care of multiple patients, with guidance</i>	• Places orders for new leukemia work-up and sees another patient with fever and neutropenia admission, with guidance from the attending • With guidance from the attending, decides to go see the patient with sickle cell disease who presents with acute pain after quickly putting in lab orders for the patient with hereditary spherocytosis who has pallor but is otherwise clinically stable
Level 3 <i>Independently and efficiently prioritizes patient care based on level of acuity</i>	• While placing orders for a new leukemia work-up, takes a break from placing orders to briefly evaluate a second patient who arrives with fever and neutropenia; places any critical orders prior to returning to complete the remainder of the orders with the new leukemia patient • While seeing a stable patient with hereditary spherocytosis, excuses self to evaluate a patient with sickle cell disease who is having a transfusion reaction; after appropriate treatment and stabilization, returns to complete the follow-up visit
Level 4 <i>Mobilizes resources to optimize patient care when volume and/or acuity approaches the capacity of the health care team</i>	• When expecting two admissions — a stable new leukemia patient and a patient with fever and neutropenia — delegates a resident to see the new leukemia patient to gather a history, while seeing the patient with neutropenia since that patient has the greater potential to decompensate; once the febrile neutropenia patient is stable and admitted, reviews the admission for the new leukemia patient with the resident and verifies the history, physical, assessment, and plan • While evaluating a stable patient with hereditary spherocytosis, excuses self to immediately evaluate a patient with sickle cell disease who has arrived and is slurring words; appropriately initiates stroke response resources to get patient with sickle cell disease emergent care
Level 5 <i>Serves as a role model and coach for patient care responsibilities</i>	• When expecting multiple admissions, including a stable new leukemia patient and a sick patient with fever and neutropenia, briefly reviews the important key history elements, physical exam findings, and differential diagnosis for both patients with multiple residents while waiting for them to arrive; sees the higher-acuity febrile neutropenia patient with one resident since that patient has the potential to decompensate, while the other resident evaluates the new leukemia patient; once both patients are stable and admitted, meets

	with both residents for feedback and teaching points, and checks in with the team and family members for further questions • When reviewing patient panel for clinic with a rotating resident and nursing staff, discusses potential urgencies and emergencies that could arise with the scheduled patients; when two patients arrive at the outpatient clinic simultaneously, asks a rotating resident to see the patient with hereditary spherocytosis for follow-up, reviewing common disease complications and anticipatory guidance; sees the patient with sickle cell disease who is having a transfusion reaction, initiating treatment and stabilizing the patient; once both patients are seen, meets with the resident to review the follow-up visit for feedback and teaching and checks in with the nurse and family members for further questions
Assessment Models or Tools	• Case-based discussion • Direct observation • Multisource feedback • Self-assessment • Simulation
Curriculum Mapping	•
Notes or Resources	• American Board of Pediatrics (ABP). "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • Covey, Stephen. 1989. <i>The Seven Habits of Highly Effective People</i>. New York, NY: Simon & Schuster. • Ledrick, David, Susan Fisher, Justin Thompson, and Mark Sniadanko. 2009. "An Assessment of Emergency Medicine Residents' Ability to Perform in a Multitasking Environment." <i>Academic Medicine</i>. 84(9): 1289-1294. doi: 10.1097/ACM.0b013e3181b18e1c.

Patient Care 3: Clinical Reasoning	
Overall Intent: To integrate collected data (e.g., history including social determinants of health, physical, laboratory/diagnostic if available) to make an informed and appropriately broad differential diagnosis	
Milestones	Examples
Level 1 <i>Organizes and summarizes information obtained from the initial evaluation to develop a broad differential diagnosis, with guidance</i>	• Recites all information elicited from patient/family/data • Inconsistently filters out extraneous/non-contributory details • Functions as a “reporter”
Level 2 <i>Integrates information to develop a broad differential diagnosis for routine hematology-oncology presentations</i> <i>Identifies clinical reasoning errors, with guidance</i>	• Suggests extensive evaluations as a proxy for a differential, saying “I saw a six-year-old with 24 hours of new-onset bruising who is well-appearing and afebrile; I think we should get a computerized tomography (CT) chest/abdomen/pelvis to look for occult bleeding and schedule a bone marrow aspirate/biopsy.” • After discussion with attending physician, understands that scheduling a bone marrow aspirate/biopsy may be premature prior to reviewing the results of the complete blood count (CBC) and the peripheral smear
Level 3 <i>Develops a thorough and prioritized differential diagnosis for routine hematology-oncology presentations</i> <i>Retrospectively applies clinical reasoning principles to identify errors</i>	• States that this is “a six-year-old female with sudden onset bruising. I think we should get a CBC, prothrombin time (PT)/partial thromboplastin time (PTT) and review the peripheral smear. Leukemia is on my differential, if there are other cytopenias.” • Upon review of the CBC showing isolated thrombocytopenia, and after eliciting a history of recent febrile illness, determines immune thrombocytopenia (ITP) is the most likely diagnosis
Level 4 <i>Develops a thorough and prioritized differential diagnosis for complex hematology-oncology presentations</i> <i>Continually re-appraises own clinical reasoning to improve patient care in real time</i>	• When review of the CBC reveals anemia and thrombocytopenia, considers thrombotic thrombocytopenic purpura (TTP) and other more urgent conditions in addition to leukemia and ITP • Reviews the peripheral smear and sees schistocytes and no leukemic blasts; interprets that TTP is now very likely and recognizes that this urgent condition must be addressed first
Level 5 <i>Coaches others to develop prioritized differential diagnoses in complex hematology-oncology presentations</i> <i>Models how to recognize errors and reflect upon one’s own clinical reasoning</i>	• During rounds, presents a six-year-old patient with new-onset bruising and schistocytes on peripheral smear, clearly articulating the rationale for probable TTP • Reviews the most recent evidence-based guidelines in the management of TTP and teaches learners the need for urgent consideration and treatment
Assessment Models or Tools	• Direct observation

	• Medical record (chart) audit • Multisource feedback • Structured clinical observation
Curriculum Mapping	•
Notes or Resources	• ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • American Society of Hematology (ASH). "ASH Academy." https://ashacademy.org. Accessed 2022. • American Society of Pediatric Hematology/Oncology (ASPHO). "Knowledge Center." http://aspho.org/knowledge-center/kc-overview. Accessed 2022 • Bowen, Judith L. 2006. "Educational Strategies to Promote Clinical Diagnostic Reasoning." <i>NEJM</i> 355: 2217-2225. https://www.nejm.org/doi/full/10.1056/NEJMra054782. • Children's Oncology Group. www.childrensoncologygroup.org. Accessed 2022. • National Comprehensive Cancer Network (NCCN). NCCN Guidelines. https://www.nccn.org/professionals/physician_gls/default.aspx. Accessed 2022. • Schumacher, Daniel J., Robert Englander, Patricia J. Hicks, Carol Carraccio, and Susan Guralnick. 2014. "Domain of Competence: Patient care." <i>Academic Pediatrics</i>. Supp:S13-S35. https://pubmed.ncbi.nlm.nih.gov/24602619/. • Society to Improve Diagnosis in Medicine. "Tools and Toolkits." https://www.improvediagnosis.org/toolkits/. Accessed 2020.

Patient Care 4: Patient Management	
Overall Intent: To lead the healthcare team in the creation of a comprehensive, patient-centered management plan based on multiple patient factors, including social factors and varied patient backgrounds, regardless of complexity	
Milestones	Examples
Level 1 <i>Participates in the creation of management plans</i>	• Suggests monitoring for tumor lysis syndrome but is not specific about details • Recommends oral iron supplements for a patient with iron deficiency anemia but is unaware of dosing and duration or necessary modifications to a patient's diet
Level 2 <i>Develops management plans for routine diagnoses, with guidance</i> <i>Adjusts management plans according to guidelines, toxicities, patient preferences, and goals, with guidance</i>	• Develops plan for a patient's chief complaint but requires guidance to address other active issues • Knows how to monitor laboratory signs of tumor lysis for a patient with newly diagnosed acute leukemia, but requires prompting to develop a plan to treat tumor lysis syndrome • Prescribes correct iron supplement but requires prompting to schedule follow up and counsel family about dietary changes • Recognizes that vincristine toxicity can include a range of neuropathy symptoms including pain, constipation, and/or weakness but requires guidance to determine how therapy would be modified in each circumstance • Requires attending guidance to how to interpret Children's Oncology Group (COG) protocol to adjust 6-Mercaptopurine (6-MP) dose based on laboratory test results • Considers therapeutic options for a patient with iron-deficient anemia who does not appear to be responding to therapy, taking into consideration that the family is vegan, with assistance from another practitioner • Requires assistance to determine therapeutic options for a patient with iron-deficiency anemia who was unable to tolerate oral ferrous sulfate
Level 3 <i>Develops and implements management plans for routine diagnoses</i> <i>Adjusts management plans according to guidelines, toxicities, patient preferences, and goals in routine circumstances</i>	• Develops and implements a plan for a patient at risk for tumor lysis, notifying interdisciplinary team including nursing and pharmacy regarding potential next steps if tumor lysis syndrome were to develop • Correctly prescribes orally administered iron supplement for a patient with uncomplicated diet-related iron deficiency anemia and counsels family on dietary modifications; arranges follow-up with either self or, as applicable, the referring practitioner • For an adolescent with a new oncologic diagnosis, recognizes clinical trial options for which the patient may be eligible when determining a treatment plan • Independently determines 6-MP dose adjustment based on laboratory test results and COG protocol when necessary • Independently determines therapeutic options for a patient with uncomplicated iron-deficiency anemia who was unable to tolerate oral ferrous sulfate

Level 4 <i>Develops and implements management plans for complex diagnoses</i> <i>Adjusts management plans according to guidelines, toxicities, patient preferences, and goals in complex circumstances</i>	• Creates an alternative management plan to treat anemia in a patient with newly diagnosed acute myeloid leukemia whose family are Jehovah's Witness and who decline a blood transfusion • Realizing a patient's mother is unable to read, ensures the patient's prescriptions are labeled in a way the mother understands so she can administer medications correctly, eliciting teach-back to gauge understanding • Develops and implements an individualized care plan for a medically complex patient who has sickle cell disease, inflammatory bowel disease, and iron-deficiency anemia • Develops management plan for an 18-year-old with multiply-relapsed Hodgkin disease who refuses any intravenous therapies
Level 5 <i>Serves as a role model and coach for development and adjustment of management plans for complex diagnoses</i>	• Promptly recognizes/identifies team members' misunderstanding and redirects discussion to consider the most important aspects of a case • Engages the team in discussing a management plan by considering the major therapeutic interventions and the evidence for and against each modality • Shares an example of error in own clinical reasoning in order to correct treatment plan and educate the team
Assessment Models or Tools	• Case-based discussion • Direct observation • Medical record (chart) audit • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• Physicians draw upon other skills and knowledge sets to create management plans. Accordingly, many other milestones may overlap with this specific milestone (SBP 3, PBLI 1, MK 2) given its complexity. However, the primary focus is to consider the overall ability to create a management plan in various areas of complexity and a variety of situations. It may be useful to consider these themes that guide management decisions: ○ Involving patients in decision-making process ○ Integrating competing priorities (e.g., risks, benefits) and preferences ○ Tolerating uncertainty ○ Monitoring treatment response and adjusting as needed • ABP. "Entrustable Professional Activities for General Pediatrics." https://www.abp.org/entrustable-professional-activities-epas. Accessed 2020. • Cook, David A., Steven J. Durning, Jonathan Sherbino, and Larry D. Gruppen. 2019. "Management Reasoning: Implications for Health Professions Educators and a Research Agenda." <i>Academic Medicine</i> 94(9):1310–1316. doi: 10.1097/ACM.0000000000002768.

- | | |
|--|---|
| | <ul style="list-style-type: none">• National Cancer Institute. "Clinical Trials Information for Patients and Caregivers." https://www.cancer.gov/about-cancer/treatment/clinical-trials. Accessed 2019.• National Comprehensive Cancer Network. "NCCN Guidelines." https://www.nccn.org/professionals/physician_gls/default.aspx. Accessed 2019. |
|--|---|

Patient Care 5: Competence in Procedures	
Overall Intent: To be proficient in all required procedures	
Milestones	Examples
Level 1 <i>Performs required procedures, with hands-on guidance</i> <i>Discusses indications and potential procedural complications</i>	• Discusses the indication for and risks of a bone marrow aspiration and biopsy in a patient with probable recurrent acute myeloid leukemia and performs procedure with supervising attending, helping to identify landmarks and setting up the procedure tray • Performs proper time-out check before procedure and prior to administration of intrathecal chemotherapy
Level 2 <i>Performs required procedures, with verbal guidance</i> <i>Recognizes complications</i>	• Recognizes when the procedure could be difficult, such as in a patient with large body habitus • Performs the lumbar puncture with the supervisor in attendance giving verbal instructions for how to angle the needle • Recognizes after failed attempt when procedure needs to be escalated to attending physician • Recognizes when a patient has a spinal headache following lumbar puncture
Level 3 <i>Performs required procedures in routine situations</i> <i>Manages complications, with guidance</i>	• Independently performs bone marrow aspirations and biopsies, with supervisor readily available to assist if necessary • Recognizes when a patient has a spinal headache following lumbar puncture and after discussion with attending gives a fluid bolus and caffeine
Level 4 <i>Performs required procedures in complex situations</i> <i>Anticipates and manages complications</i>	• Independently performs bone marrow aspirations and biopsies on patients with large body habitus that requires longer needles and repositioning • Prioritizes sample collection on bone marrow aspirates knowing which tests must be sent to guide clinical decision making • Anticipates bleeding in coagulopathic patient with acute myeloid leukemia and transfuses platelets during the procedure to prevent bleeding complications
Level 5 <i>Serves as a role model and coach for performing required procedures and managing complications</i>	• Serves as the role model for peers in performing bone marrow aspirate and biopsy • Demonstrates correct procedure techniques for other fellows/residents
Assessment Models or Tools	• Direct observation • Multisource feedback • Procedure logs • Simulation

Curriculum Mapping	•
Notes or Resources	• American Board of Pediatrics. “Entrustable Professional Activities: EPA 5 for Pediatric Hematology-Oncology.” https://www.abp.org/sites/abp/files/pdf/epa-hemo-5.pdf. Accessed 2021. • Ellenby, Miles S., Ken Tegtmeyer, Susanna Lai, and Dana A.V. Braner. 2006. “Videos in Clinical Medicine. Lumbar Puncture.” <i>The New England Journal of Medicine</i>. 355:e12. DOI: 10.1056/NEJMvcm054952. • Focosi, Daniele. 2010. “Bone Marrow Aspiration and Biopsy.” <i>The New England Journal of Medicine</i>. 182-183. doi:10.1056/NEJMc0910593. • Malempati, Suman, Sarita Joshi, Susanna Lai, Dana A.V. Braner, and Ken Tegtmeyer. 2009. “Videos in Clinical Medicine. Bone Marrow Aspiration and Biopsy.” <i>The New England Journal of Medicine</i>. 361(15):28. doi:10.1056/NEJMvcm0804634. • Pereira, Irma, Tracy I. George, and Daniel A. Arber. 2012. <i>Atlas of Peripheral Blood: The Primary Diagnostic Tool</i>. Philadelphia, PA: Wolters Kluwer.

Medical Knowledge 1: Oncology	
Overall Intent: To provide specialty-specific care for patients with or suspected of having a malignancy	
Milestones	Examples
Level 1 <i>Demonstrates basic knowledge of specialty disorders</i>	• Creates a differential diagnosis for malignant causes of pancytopenia • Identifies the most common solid tumors of childhood • Identifies patients at risk for tumor lysis syndrome and can list appropriate monitoring studies
Level 2 <i>Applies basic knowledge of specialty disorders to routine patient presentations</i>	• When evaluating a patient with a new diagnosis of acute lymphocytic leukemia (ALL), determines appropriate diagnostic studies to accurately risk stratify • In the staging of a patient with rhabdomyosarcoma, completes staging studies and appropriately identifies disease stage • Orders and follows results of tumor lysis monitoring labs and adjusts therapies as needed
Level 3 <i>Demonstrates expanded knowledge of specialty disorders and applies to routine patient presentations</i>	• Creates a management plan for a patient with newly diagnosed ALL with central nervous system (CNS) involvement, recognizing the need for additional lumbar punctures in induction due to the increased risk for CNS relapse • In the evaluation of a patient with rhabdomyosarcoma, orders and interprets indicated molecular and cytogenetics studies that further define the diagnosis, prognosis, and therapeutic options; formulates a management plan for a patient without significant comorbidities, including consideration on enrollment in clinical trials
Level 4 <i>Applies expanded knowledge of specialty disorders to complex patient presentations</i>	• Identifies therapeutic options for a patient with relapsed/refractory ALL and formulates an appropriate management plan • Personalizes management plan for a patient with rhabdomyosarcoma based on disease characteristics and comorbidities, and anticipates and manages toxicities; has a detailed understanding of all the available treatment options and recognizes need to coordinate care with other subspecialties with minimal guidance
Level 5 <i>Serves as a role model, drawing from a breadth of medical knowledge that spans the continuum of routine to complex patient presentations</i>	• Is regularly consulted by peers for assistance in the management of patients with oncologic disorders
Assessment Models or Tools	• Direct observation • In-training exam • Individualized learning plan • Medical record (chart) audit • Multisource feedback (including peer assessment) • Self-assessment
Curriculum Mapping	•

Notes or Resources	• ASCO Education. “2022 ASCO Self-Evaluation Program (SEP) (R).” https://education.asco.org/product-details/ASCO-SEP-Digital-Subscription. Accessed 2022. • ASPHO. “Knowledge Center.” https://aspho.org/knowledge-center/kc-overview. Accessed 2022. • National Comprehensive Cancer Network. “NCCN Guidelines.” https://www.nccn.org/professionals/physician_gls/default.aspx. Accessed 2022. • Niederhuber, John E., James O. Armitage, James H. Doroshow, Michael B. Kastan, and Joel E. Tepper. 2019. <i>Abeloff’s Clinical Oncology</i>. 6th ed. Philadelphia, PA: Elsevier. • Orkin, Stuart H., David G. Nathan, David Ginsburg, A. Thomas Look, David E. Fisher, and Samuel Lux IV. 2014. <i>Nathan and Oski’s Hematology and Oncology of Infancy and Childhood</i>. 8th ed. Philadelphia, PA: Elsevier. • Pizzo, Philip A., and David G. Poplack. 2016. <i>Principles and Practice of Pediatric Oncology</i>. 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins.
--------------------	--

Medical Knowledge 2: Hematology Overall Intent: To provide specialty-specific care for patients with non-malignant hematological disorders	
Milestones	Examples
Level 1 <i>Demonstrates basic knowledge of specialty disorders</i>	• In the evaluation of a patient with anemia, includes iron-deficiency anemia but doesn't consider a broader differential based on additional red blood cell indices and reticulocyte count • In discussing the management of patients with sickle cell disease, is aware of importance of prophylactic penicillin but is unaware of screening for stroke risk with transcranial dopplers
Level 2 <i>Applies basic knowledge of specialty disorders to routine patient presentations</i>	• When working up a child with anemia, interprets the CBC and reticulocyte count, correctly interprets that this may be a hemolytic anemia, and orders direct antiglobulin testing and reviews the peripheral smear • Discusses indications, risks, and benefits of hydroxyurea with a patient with sickle cell disease
Level 3 <i>Demonstrates expanded knowledge of specialty disorders and applies to routine patient presentations</i>	• Diagnoses and manages a patient with hereditary spherocytosis and aplastic crisis, understanding the indications for transfusion • Appropriately manages hydroxyurea treatment in a patient with sickle cell disease, including dose modifications based on toxicity
Level 4 <i>Applies expanded knowledge of specialty disorders to complex patient presentations</i>	• Recognizes red blood cell aplasia in a toddler and can differentiate transient erythroblastopenia of childhood from Diamond-Blackfan anemia, determining when it is appropriate to send confirmatory genetic testing • Discusses therapeutic options for patient with sickle cell disease who has co-morbidities, including history of recent stroke, frequent acute pain episodes, and non-adherence with recommended treatments
Level 5 <i>Serves as a role model, drawing from a breadth of medical knowledge that spans the continuum of routine to complex patient presentations</i>	• Is identified as a resource by residents in their continuity clinics for work-up of patients with common and rare causes of anemia • Leads a multidisciplinary care conference for a patient with sickle cell disease who was admitted to the pediatric intensive care unit (PICU)
Assessment Models or Tools	• Direct observation • In-training exam • Medical record (chart) audit • Multisource feedback
Curriculum Mapping	•

Notes or Resources	● American Society of Hematology. “ASH Self-Assessment Program (ASH-SAP).” https://ashpublications.org/books/book/8/American-Society-of-Hematology-Self-Assessment. Accessed 2022. ● Arber, Daniel A., Attilio Orazi, Robert Hasserjian, Jürgen Thiele, Michael J. Borowitz, Michelle M Le Beau, Clara D. Bloomfield, Mario Cazzola, and James W. Vardiman. 2016. “The 2016 revision to the World Health Organization Classification of Myeloid Neoplasms and Acute Leukemia.” <i>Blood</i>. 127(20): 2391-2405. doi:10.1182/blood-2016-03-643544. ● Lichtman, Marshall A., Kenneth Kaushansky, Josef T. Prchal, Marcel M. Levi, Linda J. Burns, and James O. Armitage. 2017. <i>Williams Manual of Hematology</i>. 9th ed. New York, NY: McGraw-Hill Education.
--------------------	--

Medical Knowledge 3: Bone Marrow Transplant/Cellular Therapy Overall Intent: To provide specialty-specific care for patients receiving bone marrow transplant/cellular therapy	
Milestones	Examples
Level 1 <i>Demonstrates basic knowledge of specialty disorders</i>	• Understands the reasoning behind pursuing bone marrow transplant for a patient with leukemia • Recognizes that immunosuppression can lead to many post-transplant complications
Level 2 <i>Applies basic knowledge of specialty disorders to routine patient presentations</i>	• Identifies the most appropriate time for transplant to be scheduled for a patient with leukemia based on disease response • Identifies the most common toxicities in the acute post-transplant period, such as distinguishing diarrhea due to infectious causes versus graft-versus-host disease (GVHD) based on presentation and time since transplant • Identifies and assigns appropriate grading for cytokine release syndrome (CRS)
Level 3 <i>Demonstrates expanded knowledge of specialty disorders and applies to routine patient presentations</i>	• Understands general principles of donor selection and choice of conditioning regimen for a patient with leukemia who needs a bone marrow transplant • Identifies prophylactic medications in the post-transplant period based on susceptibility to different infections at different time points with respect to engraftment • Knows appropriate treatment of CRS based on grading and clinical picture
Level 4 <i>Applies expanded knowledge of specialty disorders to complex patient presentations</i>	• Weighs risks and benefits of available donors and stem cell sources • Understands risk factors for developing CRS and anticipates the required treatment • Identifies additional risk factors for a patient needing a second bone marrow transplant, anticipates toxicities, and plans appropriate conditioning regimen
Level 5 <i>Serves as a role model, drawing from a breadth of medical knowledge that spans the continuum of routine to complex patient presentations</i>	• Teaches junior learners the principles of donor selection and post-transplant management • Is identified as a resource for distinguishing between need for chimeric antigen receptor (CAR) T-cells versus bone marrow transplant
Assessment Models or Tools	• Direct observation • In-training exam • Medical record (chart) audit • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• American Society for Transplantation and Cellular Therapy. https://www.astct.org/learn/practice-guidelines. Accessed 2022 • Bloodline. www.bloodline.net. Accessed 2022. • Center for International Blood & Marrow Transplant Research. https://www.cibmtr.org/pages/index.aspx. Accessed 2022.

- | | |
|--|--|
| | <ul style="list-style-type: none">• Forman, Stephen J., Robert S. Negrin, Joseph H. Antin, and Frederick R. Appelbaum, Eds. 2016. <i>Thomas' Hematopoietic Cell Transplantation, 2 Volume Set Stem Cell Transplantation</i>. 5th ed. Wiley-Blackwell.• Foundation for the Accreditation of Cellular Therapy. www.factglobal.org. Accessed 2022.• National Marrow Donor Program. https://network.bethematchclinical.org/about-us/. Accessed 2022.• Pediatric Transplantation & Cellular Therapy Consortium. https://www.theptctc.org/. Accessed 2022. |
|--|--|

Medical Knowledge 4: Diagnostic Evaluation	
Overall Intent: To order diagnostic tests and subspecialty consultations (if appropriate), tailoring the evaluation to patient complexity, severity of illness, and the most likely diagnosis(es); to interpret results accurately within the context of the clinical picture	
Milestones	Examples
Level 1 <i>Recommends broad diagnostic evaluations</i> <i>Reports results of diagnostic studies</i>	• Lists magnetic resonance imaging (MRI), CT, positron emission tomography (PET) scan, and bone scan as possibilities for staging a patient with Ewing sarcoma but cannot explain what specific information each test would yield • When evaluating a toddler with mild microcytic anemia in clinic, orders extensive initial lab evaluation rather than a tiered work-up • Reports the results of a lumbar puncture without interpretation
Level 2 <i>Recommends focused diagnostic evaluations</i> <i>Interprets study results to guide diagnosis</i>	• Explains the diagnostic yield of MRI, CT, PET scan, and/or bone scan for staging a patient with Ewing sarcoma and prioritizes the sequence of diagnostic evaluations, with guidance from attending • When evaluating a toddler with mild microcytic anemia in clinic, recognizes CBC, reticulocyte count, and ferritin as first steps in evaluation • For a patient with newly diagnosed Hodgkin lymphoma, recognizes that multiple sites of disease above and below the diaphragm represents more advanced disease but requires attending guidance to consider full clinical picture in order to assign stage
Level 3 <i>Prioritizes evaluation based on risks, indications, and alternatives in routine circumstances</i> <i>Interprets study results to determine diagnosis, stage, or severity of illness, while considering study limitations, in routine circumstances</i>	• Recommends an appropriate, focused, staged (step-wise) workup for a four-year-old admitted with hematuria, abdominal pain, and abdominal mass on x-ray • When consulted by the neonatal intensive care unit (NICU) for a 29-week gestational age infant with a slightly prolonged PTT and no evidence of bleeding or significant family history, recommends monitoring clinically prior to performing extensive evaluation for factor deficiencies • For a patient with newly diagnosed Hodgkin lymphoma, independently stages disease based on imaging results and presence of fever and night sweats at presentation
Level 4 <i>Prioritizes evaluation based on risks, indications, and alternatives in complex circumstances</i>	• For a patient with large mediastinal mass and inability to remain supine without shortness of breath, coordinates the safest diagnostic work-up • For a patient with fevers, highly elevated ferritin, hepatosplenomegaly, and pancytopenia, recognizes that absence of peripheral blasts does not exclude the possibility of leukemia; considers a bone marrow biopsy and discusses ordering genetic testing as part of the work-up for a hemophagocytic lymphohistiocytosis (HLH) diagnosis

<i>Interprets study results to determine diagnosis, stage, or severity of illness, while considering study limitations, in complex circumstances</i>	• For a patient undergoing staging evaluation for neuroblastoma, recognizes that the absence of meta-iodobenzylguanidine (MIBG) avidity of the primary tumor limits the ability to use MIBG scan for staging and appropriately orders a PET scan for work-up of metastatic disease
Level 5 <i>Role models and coaches others to guide diagnostic decision making and interpret study results</i>	• Explains to junior learners the risks of settling on a diagnosis too early and identifies alternative life-threatening etiologies that must be considered: chest pain in patient with sickle cell disease may not just be volatile organic compounds (VOC) or acute chest syndrome (ACS), but could also be pulmonary embolism • When a resident rules out a diagnosis of a specific infection based on a negative serologic antibody test, points out that these tests may result in a false negative if the patient is immunodeficient • Models articulating reasoning/thought process behind diagnostic decision making to other practitioners, families, and patients in both verbal and written communication
Assessment Models or Tools	• Chart audits • Clinical evaluations • Direct observation • In-training examination • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • Cutler, Paul. 1998. <i>Problem Solving in Clinical Medicine: From Data to Diagnosis</i>. 3rd ed. Baltimore, MD: Lippincott, Williams & Wilkins. • Englander, Robert, and Carol Carraccio. 2014. "Domain of Competence: Medical Knowledge." <i>Academic Pediatrics</i> 14(2)Supp: S36-S37. https://www.sciencedirect.com/science/article/abs/pii/S1876285913003240. • Epner, Paul L., Janet E. Gans, and Mark L. Graber. 2013. "When Diagnostic Testing Leads to Harm: A New Outcomes-Based Approach for Laboratory Medicine." <i>BMJ Quality & Safety</i> 22(Supp 2): ii6-ii10. https://pubmed.ncbi.nlm.nih.gov/23955467/.

Systems-Based Practice 1: Patient Safety Overall Intent: To engage in the analysis and management of patient safety events, including relevant communication with patients, patients' families, and health care professionals	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of common patient safety events</i> <i>Demonstrates knowledge of how to report patient safety events</i>	• Lists common patient safety events such as patient misidentification or medication errors • Lists "patient safety reporting system" or "patient safety hotline" as ways to report safety events
Level 2 <i>Identifies system factors that lead to patient safety events</i> <i>Reports patient safety events through institutional reporting systems (simulated or actual)</i>	• Identifies that electronic health record (EHR) default timing of orders as "routine" (without changing to "stat") may lead to delays in antibiotic administration time for sepsis • Reports delayed antibiotic administration time using the appropriate reporting mechanism
Level 3 <i>Participates in analysis of patient safety events (simulated or actual)</i> <i>Participates in disclosure of patient safety events to patients and families (simulated or actual)</i>	• Participates in department morbidity and mortality presentations • Participates in root cause analyses (mock or actual) • Participates in a quality improvement project aimed at reducing racial disparities • With the support of an attending or risk management team member, participates in the disclosure of a medication order error to a patient's family
Level 4 <i>Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)</i> <i>Discloses patient safety events to patients and families (simulated or actual)</i>	• Leads a simulated or actual root cause analysis related to a patient who received an incorrect dose of chemotherapy and develops action plan that includes review of current process, development of a checklist, and nursing sign-off prior to administration • Following consultation with risk management and other team members, independently discloses a medication error to a patient's family
Level 5 <i>Actively engages teams and processes to modify systems to prevent patient safety events</i> <i>Role models or mentors others in the disclosure of patient safety events</i>	• Leads a multidisciplinary team to work on improved medication reconciliation processes to prevent discharge medication errors and considers biases among team members • Conducts a simulation demonstrating techniques and approaches for disclosing patient safety events • Teaches learners about the fellow's role in disclosure of patient safety events
Assessment Models or Tools	• Case-based discussion • Direct observation

	• Guided reflection • Medical record (chart) audit • Multisource feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• ABP. “Entrustable Professional Activities for Subspecialties: Hematology-Oncology.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • ASPHO. “Practice and Quality.” http://aspho.org/knowledge-center/practice-and-quality. Accessed 2022. • Guralnick, Susan, Stephen Ludwig, and Robert Englander. 2014. “Domain of Competence: Systems-Based Practice.” <i>Academic Pediatrics</i>. 14(2 Suppl): S70-S79. https://doi.org/10.1016/j.acap.2013.11.015. • Institute for Healthcare Improvement. http://www.ihp.org/Pages/default.aspx. Accessed 2020. • Singh, Ranjit, Bruce Naughton, John S. Taylor, Marlon R. Koenigsberg, Diana R. Anderson, Linda L. McCausland, Robert G. Wahler, Amanda Robinson, and Gurdev Singh. 2005. “A Comprehensive Collaborative Patient Safety Residency Curriculum to Address the ACGME Core Competencies.” <i>Medical Education</i>. 39(12): 1195-204. DOI: 10.1111/j.1365-2929.2005.02333.x. • Solutions for Patient Safety. https://www.solutionsforpatientsafety.org/. Accessed 2022.

Systems-Based Practice 2: Quality Improvement Overall Intent: To understand and implement quality improvement methodologies to improve patient care	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of basic quality improvement methodologies and metrics</i>	• Describes fishbone diagram • Describes components of a “Plan-Do-Study-Act” cycle
Level 2 <i>Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate, smoking cessation)</i>	• Describes clinic initiatives to improve adherence to hydroxyurea (sickle cell disease) or mercaptopurine (acute lymphoblastic leukemia) therapy • Describes an initiative in the continuity clinic to improve influenza vaccination rates in the children seen in that clinic
Level 3 <i>Participates in local quality improvement initiatives</i>	• Participates in an ongoing interdisciplinary project to improve medication reconciliation • Collaborates on a project to improve discharge efficiency
Level 4 <i>Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project</i>	• Develops and implements a quality improvement project to improve vaccination rates for patients with sickle cell disease followed in the hematology clinic, which includes engaging the office team, assessing the problem, articulating a broad goal, developing a SMART (Specific, Measurable, Attainable, Realistic, Time-bound) aim, collecting data, analyzing, and monitoring progress and challenges • In developing a quality improvement project, considers team bias and social determinants of health in patient population
Level 5 <i>Creates, implements, and assesses quality improvement initiatives at the institutional or community level</i>	• Initiates and completes a quality improvement project to improve county vaccination rates for patients with sickle cell disease in collaboration with the county health department, and shares results through a formal presentation to the community leaders • Looks for opportunities to improve clinic vaccination rates across a health care system • Consistently engages in quality improvement around improving clinic vaccination rates
Assessment Models or Tools	• Direct observation • E-module with multiple choice test • Portfolio • Poster or other presentation • Team evaluations
Curriculum Mapping	•
Notes or Resources	• ABP. “Entrustable Professional Activities for Subspecialties: Hematology-Oncology.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • Bright Futures. “QI Office System Tools.” https://www.aap.org/en/practice-management/bright-futures/bright-futures-quality-improvement/qi-office-system-tools/. Accessed 2020.

- | | |
|--|--|
| | <ul style="list-style-type: none">• Guralnick, Susan, Stephen Ludwig, and Robert Englander. 2014. "Domain of competence: Systems-based Practice." <i>Academic Pediatrics</i>. 14(2 Suppl): S70-S79. https://doi.org/10.1016/j.acap.2013.11.015.• Institute for Healthcare Improvement. http://www.ihl.org/Pages/default.aspx. Accessed 2020.• Murtagh Kurowski, Eileen, Amanda C. Schondelmeyer, Courtney Brown, Christopher E. Dandoy, Samuel J. Hanke, and Heather L. Tubbs Cooley. 2015. "A Practical Guide to Conducting Quality Improvement in the Health Care Setting." <i>Current Treatment Options in Pediatrics</i>. 1:380-392. https://doi.org/10.1007/s40746-015-0027-3. |
|--|--|

Systems-Based Practice 3: System Navigation for Patient-Centered Care – Coordination of Care Overall Intent: To effectively navigate the health care system, including the interdisciplinary team and other care practitioners; to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	Examples
Level 1 <i>Lists the various interprofessional individuals involved in the patient's care coordination</i>	• For a patient with cancer, identifies the team members and their roles, including pediatric hematologist-oncologist, clinic and hospital nurses, advanced practice providers and social workers; understands each team member's role
Level 2 <i>Coordinates care of patients in routine clinical situations, incorporating interprofessional teams with consideration of patient and family needs</i>	• After induction chemotherapy for a patient with a new diagnosis of acute lymphoblastic leukemia, coordinates care with the oncology clinic at the time of discharge from the hospital • Coordinates home health care and verifies appropriate insurance coverage for a patient with hemophilia who needs factor replacement • Recognizes implicit bias as a contributor to health care disparities • Identifies access to care and insurance coverage as social determinants of health • Ensures coordinated care of patients by communicating with appropriate team members such as nurse coordinators, advanced practice providers, and case managers as necessary
Level 3 <i>Coordinates care of patients in complex clinical situations, effectively utilizing the roles of interprofessional teams, and incorporating patient and family needs and goals</i>	• Works with the social worker to coordinate outpatient care and ensure appropriate oncology clinic follow up for a patient with lymphoblastic leukemia who resides in a rural area with limited family transportation options • Refers patients to a local pharmacy that offers a sliding fee scale and provides pharmacy coupons for patients in need • Recognizes that marginalized communities may have additional barriers to access and the need to involve a social worker or case manager in finding community resources • Involves nurses and pharmacists when helping create a picture medication chart for a patient's family that is unable to read • Coordinates care with subspecialists such as radiology, radiation oncology, surgery, and pathology
Level 4 <i>Coordinates interprofessional, patient-centered care among different disciplines and specialties, actively assisting families in navigating the health-care system</i>	• During inpatient rotations, leads team members in approaching consultants to review cases/recommendations and arranges radiology rounds for the team • Recognizes the need for and coordinates a multidisciplinary team/family meeting to include appropriate subspecialists, physical therapist/occupational therapist, nutrition, child life, mental health resources, chaplain services, social worker, the primary hematologist/oncologist, etc.
Level 5 <i>Coaches others in interprofessional, patient-centered care coordination</i>	• Leads an initiative to educate residents about home health services or medical home model for medically complex children, ensuring inclusion of discussion on health care disparities

	• Coaches and mentors colleagues through a multidisciplinary team meeting of a child with complex health care needs
Assessment Models or Tools	• Direct observation • Entrustable professional activities • Medical record (chart) audit • Multisource feedback • Review of discharge planning documentation
Curriculum Mapping	•
Notes or Resources	• AAP. Pediatric Care Coordination Resources. https://www.aap.org/en/practice-management/care-delivery-approaches/care-coordination-resources/. Accessed 2022. • ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • Skochelak, Susan E., Maya M. Hammond, Kimberly D. Lomis, Jeffrey M. Borkan, Jed. D. Gonzalo, Luan E. Lawson, and Stephanie R. Starr. 2020. <i>AMA Education Consortium: Health Systems Science</i>, 2nd ed. Elsevier. • Starr, Stephanie R., Neera Agrwal, Michael J. Bryan, Yuna Buhrman, Jack Gilbert, Jill M. Huber, Andrea N. Leep Hunderfund, et al. 2017. "Science of Health Care Delivery: An Innovation in Undergraduate Medical Education to Meet Society's Needs." <i>Mayo Clinic Proceedings: Innovations, Quality & Outcomes</i>. 1(2): 117-129. https://www.sciencedirect.com/science/article/pii/S2542454817300395.

Systems-Based Practice 4: System Navigation for Patient-Centered Care – Transitions in Care Overall Intent: To effectively navigate the health delivery system during transitions of care to ensure high-quality patient outcomes	
Milestones	Examples
Level 1 <i>Uses a standard template for transitions of care/hand-offs</i>	When handing off to colleagues, reads verbatim from a templated hand-off but lacks context, is not appropriately specific in next steps, and does not provide contingency plans
Level 2 <i>Adapts a standard template, recognizing key elements for safe and effective transitions of care/hand-offs in routine clinical situations</i>	- Routinely uses a standardized hand-off for a stable patient, verbalizes a basic understanding of active problems, and provides basic contingency plans - Discusses the discharge of a patient with sickle cell disease with the primary hematologist and provides a problem list, clinical course, and action items to be followed up as an outpatient
Level 3 <i>Performs safe and effective transitions of care/hand-offs in complex clinical situations, and ensures closed-loop communication</i>	- Routinely uses a standardized hand-off when transferring a patient to the intensive care unit (ICU), with direct communication of clinical reasoning, problems warranting a higher level of care, and status of completed/planned interventions; solicits read-back and confirms/uses specific resources and timeline for transfer to occur - Performs the hand-off for a patient following a prolonged stem-cell transplant admission to the outpatient team with a succinct summary by problem or system, a timeline for outpatient follow-up and repeat testing, with clearly delineated responsibilities
Level 4 <i>Performs and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems, including transitions to adult care</i>	- Prior to going on vacation, proactively seeks out colleagues to follow up test results that are still pending and expected back during that week with specific instructions and contingency plans for the follow-up visit with the patient/family - Seeks out appropriate adult hematology and other subspecialty practitioners to facilitate the transition of a 20-year-old patient with sickle cell disease to adult care; ensures a thorough hand-off, including the patient's cultural preferences and social needs, to the identified new adult practitioners and ensures appropriate insurance coverage
Level 5 <i>Coaches others in improving transitions of care within and across health care delivery systems to optimize patient outcomes</i>	- Designs and implements standardized hand-off exercises for medical students - Develops and implements a process to improve the process of transitioning patients with sickle cell disease from pediatric to adult medicine practitioners
Assessment Models or Tools	- Direct observation - Standardized hand-off checklist - Multisource feedback - Simulation - Review of sign-out tools, use and review of checklists
Curriculum Mapping	

Notes or Resources	• ABP. “Entrustable Professional Activities for Subspecialties: Hematology-Oncology.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • I-PASS. 2014. “I-PASS Materials.” https://www.ipasshandoffstudy.com/home. Accessed 2022. • Matern, Lukas H., Jeanne M. Farnan, Kristen W. Hirsch, Melissa Cappaert, Ellen S. Byrne, and Vineet M. Arora. 2018. “A Standardized Handoff Simulation Promotes Recovery from Auditory Distractions in Resident Physicians.” <i>Simulation in Healthcare</i>. 13(4): 233-238. DOI: 10.1097/SIH.0000000000000322. • Society for Adolescent Health and Medicine. 2020. “Transition to Adulthood for Youth with Chronic Conditions and Special Health Care Needs.” <i>Journal of Adolescent Health</i>. 66(5): P631-634. https://www.jahonline.org/article/S1054-139X(20)30075-6/fulltext. • Starmer, Amy J., Nancy D. Spector, Rajendu Srivastava, Daniel C. West, Glenn Rosenbluth, April D. Allen, Elizabeth L. Noble, et al. “Changes in Medical Errors after Implementation of a Handoff Program.” <i>New England Journal of Medicine</i>. 371:1803-1812. DOI: 10.1056/NEJMSa1405556.
--------------------	--

Systems-Based Practice 5: Population and Community Health	
Overall Intent: To promote and improve health across communities and populations through patient care and advocacy, including public education and elimination of structural racism	
Milestones	Examples
Level 1 <i>Demonstrates awareness of population and community health needs and disparities</i>	- Identifies social determinants of health, such as poverty and structural racism - Identifies populations most at risk for food insecurity - Recognizes differing rates of enrollment in clinical trials based on race/ethnicity
Level 2 <i>Identifies specific population and community health needs and disparities; identifies local resources</i>	- Screens families for food insecurity during clinic visit - Recognizes and refers families in need of resources to social work - Identifies lower rates of enrollment in clinical trials among the Latino population
Level 3 <i>Uses local resources effectively to meet the needs and reduce health disparities of a patient population and community</i>	- Works with social work to provide lists of local resources to specific families in need - Uses a Spanish short form and in-person interpreter when discussing clinical trials with Spanish-speaking families
Level 4 <i>Adapts practice to provide for the needs of and reduce health disparities of a specific population</i>	- Participates in an advocacy project to improve health care access and/or decrease practices that support structural racism - Participates in a Saturday clinic to care for patients whose parents work and cannot take time off - Works with translation services to create fully translated consent/education forms - Works with clinic leadership to allow patients who rely on public transportation to be seen even when late for their appointments
Level 5 <i>Advocates at the local, regional, or national level for populations and communities with health care disparities</i>	- Engages with Jehovah's Witness community leaders to provide education about transfusion of blood products and develop an agreement to allow for blood transfusions in medically necessary cases - Leads quality improvement project assessing rates of food insecurity and partners with local foodbanks to assist specific families - Engages with community leaders in the Latino community to increase knowledge and address concerns regarding clinical trials
Assessment Models or Tools	- Analysis of process and outcomes measures based on social determinants of health and resultant disparities - Direct observation - Medical record (chart) audit - Multisource feedback - Reflection
Curriculum Mapping	
Notes or Resources	- AAP. "Advocacy." https://services.aap.org/en/advocacy/. Accessed 2022. - AAP. Bright Futures. Promoting Lifelong Health for Families and Communities. https://downloads.aap.org/AAP/PDF/Bright%20Futures/BF4_LifelongHealth.pdf?_ga=2.26

- [8230030.1236819861.1654476607-929400881.1619626826&_qac=1.229642574.1651085941.cj0kcqiw06otbhc_arisaau1yov_dcxkc8cjmzqntgqmfjsj0_flej6v7e95sxi3exmdjyivnt1vv9rxoaamnzealw_wcb](https://doi.org/10.1230030.1236819861.1654476607-929400881.1619626826&_qac=1.229642574.1651085941.cj0kcqiw06otbhc_arisaau1yov_dcxkc8cjmzqntgqmfjsj0_flej6v7e95sxi3exmdjyivnt1vv9rxoaamnzealw_wcb). Accessed 2022.
- ABP. “Entrustable Professional Activities for Subspecialties: Hematology-Oncology.” <https://www.abp.org/content/entrustable-professional-activities-subspecialties>. Accessed 2022.
 - Blankenburg, Rebecca, Patricia Poitevien, Javier Gonzalez del Rey, Megan Aylor, John Frohna, Heather McPhillips, Linda Waggoner-Fountain, and Laura Degnon. 2020. “Dismantling Racism: Association of Pediatric Program Directors’ Commitment to Action.” *Academic Pediatrics*. 20(8): 1051-1053. doi: 10.1016/j.acap.2020.08.017.
 - Centers for Disease Control and Prevention. “Fast Facts: Preventing Adverse Childhood Experiences.” https://www.cdc.gov/violenceprevention/aces/fastfact.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fviolenceprevention%2Facestudy%2Ffastfact.html. Accessed 2020.
 - DallaPiazza, Michelle, Mercedes Padilla-Register, Megana Dwarakanath, Elyon Obamedo, James Hill, and Maria L. Soto-Greene. 2018. “Exploring Racism and Health: An Intensive Interactive Session for Medical Students.” *MedEdPORTAL*. 14:10783. https://doi.org/10.15766/mep_2374-8265.10783.
 - Johnson, Tiffani J. 2020. “Intersection of Bias, Structural Racism, and Social Determinants with Health Care Inequities.” *Pediatrics*. 146(2): e2020003657. <https://doi.org/10.1542/peds.2020-003657>.
 - Trent, Maria, Danielle G. Dooley, Jacqueline Dougé, Section on Adolescent Health, Council on Community Pediatrics, Committee on Adolescence, Robert M. Cavanaugh, et al. 2019. “The Impact of Racism on Child and Adolescent Health.” *Pediatrics*. 144(2):e20191765. <https://doi.org/10.1542/peds.2019-1765>.

Systems-Based Practice 6: Physician Role in Health Care Systems Overall Intent: To understand the physician's role in health systems science to optimize patient care delivery, including cost-conscious care	
Milestones	Examples
Level 1 <i>Engages with patients and other providers in discussions about cost-conscious care and key components of the health care delivery system</i>	• Considers the differences in cost for a patient in the hospital versus being closely followed as an outpatient • Articulates the impact of patients coming to clinic for non-emergent acute visits instead of seeking care in the emergency department • Considers that insurance coverage, or lack of coverage, can affect prescription drug availability/cost for individual patients
Level 2 <i>Identifies the relationships between the delivery system and cost-conscious care and the impact on the patient care</i>	• Considers the patient's prescription drug coverage when choosing a Pegfilgrastim product for the treatment of neutropenia • Ensures that a patient with sickle cell disease hospitalized with a vaso-occlusive crisis has a scheduled follow-up appointment at discharge to try to prevent rapid readmission • Takes careful phone history and uses evidence-based approach in recognizing when patient can be seen in clinic next day in order to avoid unnecessary emergency department visit • Conducts peer-to-peer review of a case for insurance approval of a diagnostic test
Level 3 <i>Discusses the need for changes in clinical approaches based on evidence, outcomes, and cost-effectiveness to improve care for patients and families</i>	• Does not order a respiratory viral panel when it will not change management and accepts an appropriate level of uncertainty when balancing cost-conscious care • Using an evidence-based approach, discusses risks, benefits, and cost of pursuing imaging and laboratory testing in a patient undergoing evaluation for suspected disseminated fungal infection • Recommends to residents that they order a comprehensive metabolic panel (CMP) instead of ordering separate tests for electrolytes and liver enzymes because the CMP is cheaper and provides the same data
Level 4 <i>Advocates for the promotion of safe, quality, and high-value care</i>	• Works collaboratively to identify additional services for a patient undergoing a bone marrow transplant with limited resources • Works collaboratively to update institutional thrombosis work-up and management guidelines • Develops an understanding of health care payor systems and how they affect coordination of care for patients
Level 5 <i>Coaches others to promote safe, quality, and high-value care across health care systems</i>	• Raises awareness at a systems level to promote cost-conscious care by implementing Choosing Wisely recommendations or developing a local evidence-based guideline • Leads a quality improvement project to establish routine phone follow up for patients with sickle cell disease discharged from the emergency department after treatment of vaso-

	occlusive crisis to ensure patients picked up prescribed medications and that pain is adequately controlled
Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Multisource assessment • Patient safety conference • Review and guided reflection on costs accrued for individual patients or patient populations with a given diagnosis
Curriculum Mapping	•
Notes and Resources	• Agency for Healthcare Research and Quality (AHRQ). “Measuring the Quality of Physician Care.” https://www.ahrq.gov/talkingquality/measures/setting/physician/index.html. Accessed 2019. • AAP. Practice Management. https://www.aap.org/en/practice-management/. Accessed 2022. • American Board of Internal Medicine. “QI/PI Activities.” https://www.abim.org/maintenance-of-certification/earning-points/qi-pi-activities.aspx. Accessed 2022. • ABP. “Entrustable Professional Activities for Subspecialties: Hematology-Oncology.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • American College of Physicians. “Newly Revised: Curriculum for Educators and Residents (Version 4.0).” https://www.acponline.org/clinical-information/high-value-care/medical-educators-resources/newly-revised-curriculum-for-educators-and-residents-version-40. Accessed 2020. • Choosing Wisely. “American Academy of Pediatrics: Ten Things Physicians and Patients Should Question.” https://www.choosingwisely.org/societies/american-academy-of-pediatrics/. Accessed 2020. • The Commonwealth Fund. “State Health Data Center.” http://datacenter.commonwealthfund.org/?_ga=2.110888517.1505146611.1495417431-1811932185.1495417431#ind=1/sc=1. Accessed 2020. • Dzau, Victor J., Mark McClellan, Sheila Burke, Molly J. Coye, Thomas A. Daschle, Angela Diaz, William H. Frist, et al. 2017. “Vital Directions for Health and Health Care: Priorities from a National Academy of Medicine Initiative.” <i>NAM Perspectives</i>. Discussion Paper, National Academy of Medicine, Washington, DC. https://doi.org/10.31478/201703e. • Solutions for Patient Safety. “Hospital Resources.” https://www.solutionsforpatientsafety.org/for-hospitals/hospital-resources/. Accessed 2022.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice Overall Intent: To incorporate evidence and apply it to individual patients and patient populations	
Milestones	Examples
Level 1 <i>Develops an answerable clinical question and demonstrates how to access available evidence, with guidance</i>	• Identifies a question such as, “What is the appropriate treatment for this patient with neutropenia?” but needs guidance to focus it into a searchable question • Uses general medical resources (i.e., background information) such as UpToDate or DynaMed to search for answers • Retrieves broad array of related information yet has some difficulty independently filtering through information or vetting information sources to answer clinical question
Level 2 <i>Independently articulates clinical question and accesses available evidence</i>	• Clearly identifies a focused, answerable question (e.g., “Among children with cyclic neutropenia, does oral antibiotic prophylaxis decrease the rate of hospitalization for neutropenic fever?”) • Uses PubMed to search for the answer to a clinical question and appropriately filters results
Level 3 <i>Locates and applies the evidence, integrated with patient preference, to the care of patients</i>	• Obtains, appraises, and applies evidence for use of prophylactic antibiotic therapy in patients with cyclic neutropenia at their nadir • Efficiently searches and filters key databases, retrieving information that is specific to the clinical question • Evaluates diagnostic criteria that center around social identifiers such as race, gender, and body mass index (BMI)
Level 4 <i>Critically appraises and applies evidence, even in the face of uncertainty and conflicting evidence to guide care tailored to the individual patient</i>	• Routinely seeks out and applies evidence to the care of individual patients or populations to change (or re-evaluate) own clinical practice • Adds to library of resources with updated primary literature or clinical guidelines with new revisions • Discusses possible outcomes and side effects to determine and tailor therapies to the patient's goals • Uses levels of evidence to weigh the primary outcomes that apply to the care of individual patients
Level 5 <i>Coaches others to critically appraise and apply evidence for complex patients</i>	• Coaches residents/fellows on ways to determine source credibility when searching the literature • As part of a team, develops an evidence-based clinical pathway in the EHR for children with cyclic neutropenia
Assessment Models or Tools	• Direct observation • Presentation evaluation (journal club, tumor board, etc.) • Research portfolio

	• Rotation evaluations
Curriculum Mapping	•
Notes or Resources	• ABP. “Entrustable Professional Activities for Subspecialties: Hematology-Oncology.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • Duke University. “Evidence-Based Practice.” https://guides.mclibrary.duke.edu/ebm/home. Accessed 2020. • Guyatt, Gordon, Drummond Rennie, Maureen O. Meade, and Deborah Cook. 2015. <i>Users’ Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice</i>, 3rd ed. USA: McGraw-Hill Education. https://jamaevidence.mhmedical.com/Book.aspx?bookId=847. Accessed 2020. • US National Library of Medicine. “PubMed® Online Training.” https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html. Accessed 2020.

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth Overall Intent: To continuously improve patient care based on self-evaluation and lifelong learning	
Milestones	Examples
Level 1 <i>Participates in feedback sessions</i> <i>Develops personal and professional goals, with assistance</i>	• Attends scheduled feedback sessions • Develops a goal with faculty member to learn how often a patient with sickle cell disease comes to clinic for routine surveillance and preventive care • Acknowledges own implicit/explicit biases
Level 2 <i>Demonstrates openness to feedback and performance data</i> <i>Designs a learning plan based on established goals, feedback, and performance data, with assistance</i>	• Acknowledges concerns about timely note completion and works with clinic preceptor to develop goals for improvement • The fellow receives feedback about not consistently following the recommended standard of care for clinic patients with sickle cell disease. With the help of an attending, the fellow develops an individual learning plan to review and apply institutional practice guidelines and National Heart, Lung, and Blood Institute (NHLBI) guidelines • Devises a plan to explore biases and how they impact care and peer relationships
Level 3 <i>Seeks and incorporates feedback and performance data episodically</i> <i>Designs and implements a learning plan by analyzing and reflecting on the factors which contribute to gap(s) between performance expectations and actual performance</i>	• Sometimes seeks feedback during/after challenging patient encounters • Identifies problems performing a lumbar puncture and arranges to spend more time in the simulation lab to improve skills • Receives feedback about not consistently following the recommended standard of care for clinic patients with sickle cell disease; recognizing knowledge deficit, develops an individual learning plan to review and apply institutional practice guidelines and NHLBI guidelines • Recognizes own implicit biases that affected care for a transgender male seeking care for melanoma and takes steps to mitigate bias
Level 4 <i>Seeks and incorporates feedback and performance data consistently</i> <i>Adapts a learning plan using long-term professional goals, self-reflection, and performance data to measure its effectiveness</i>	• Initiates a quarterly chart audit to ensure appropriate individualized pain plans for all patients in the clinic with sickle cell disease • Consistently proactively seeks feedback after challenging patient encounters • Actively seeks out midpoint/end rotation reviews, requesting constructive criticism of performance on a rotation • Adapts learning plan to improve knowledge of office-based care for patients with sickle cell disease based on personal reflection, feedback, and patient data

	• Actively seeks out conferences/resources to learn about anti-racism and bystander culture
Level 5 <i>Role models and coaches others in seeking and incorporating feedback and performance data</i> <i>Demonstrates continuous self-reflection and coaching of others on reflective practice</i>	• Leads a clinic discussion on opportunities to improve implementation of individualized pain plans for all patients cared for by the clinic • Meets with learners to review practice habits and develop their learning goals • Reflects on own actions “out loud” in front of others: “I anchored on diagnosis X and didn’t consider the possibility of diagnosis Y Next time I encounter a similar situation, I will do A, B, C differently”
Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Review of learning plan
Curriculum Mapping	•
Notes or Resources	• ABP. “Entrustable Professional Activities for Subspecialties: Hematology-Oncology.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • Burke, Anne E., Bradley Benson, Robert Englander, Carol Carraccio, and Patricia J. Hicks. 2014. “Domain of Competence: Practice-Based Learning and Improvement.” <i>Academic Pediatrics</i>. 14(2): S38-S54. DOI: https://doi.org/10.1016/j.acap.2013.11.018. • Lerchenfeldt, Sarah, and Tracey A.H. Taylor. 2020. “Best Practices in Peer Assessment: Training Tomorrow’s Physicians to Obtain and Provide Quality Feedback.” <i>Advances in Medical Education and Practice</i>. 11:571-578. doi:10.2147/AMEP.S250761. • Lockspeiser, Tai M., Su-Ting T. Li, Ann E. Burke, Adam A. Rosenberg, Alston E. Dunbar 3rd, Kimberly A. Gifford, Gregory H. Gorman, et al. 2016. “In Pursuit of Meaningful Use of Learning Goals in Residency: A Qualitative Study of Pediatric Residents.” <i>Academic Medicine</i>. 91(6):839-846. DOI: 10.1097/ACM.0000000000001015. • Lockspeiser, Tai M., Patricia A. Schmitter, J. Lindsey Lane, Janice L. Hanson, Adam A. Rosenberg, and Yoon Soo Park. 2013. “Assessing Residents’ Written Learning Goals and Goal Writing Skill: Validity Evidence for the Learning Goal Scoring Rubric.” <i>Academic Medicine</i>. 88(10):1558-1563. DOI: 10.1097/ACM.0b013e3182a352e6. • Tekian, Ara, Christopher J. Watling, Trudie E. Roberts, Yvonne Steinert, and John Norcini. 2017 “Qualitative and Quantitative Feedback in the Context of Competency-Based Education. <i>Medical Teacher</i>. 39:12, 1245-1249, DOI: 10.1080/0142159X.2017.1372564.

Professionalism 1: Professional Behavior	
Overall Intent: To demonstrate ethical and professional behaviors and promote these behaviors in others, and to use appropriate resources to manage professional dilemmas	
Milestones	Examples
Level 1 <i>Identifies expected professional behaviors and potential triggers for lapses</i> <i>Identifies the value and role of pediatric hematology oncology as a vocation/career</i>	- Identifies that being sleep deprived may cause a lapse in professional behavior - Acknowledges the importance of pediatric hematologists/oncologists in providing specialized care
Level 2 <i>Demonstrates professional behavior with occasional lapses</i> <i>Demonstrates accountability for patient care as a pediatric hematologist/oncologist, with guidance</i>	- Is late to morning rounds, identifies this lapse, and immediately apologizes to peers and attendings upon arrival - After guidance from an attending, calls a patient and the patient's family to discuss recent scan results
Level 3 <i>Maintains professional behavior in increasingly complex or stressful situations</i> <i>Fully engages in patient care and holds oneself accountable</i>	- Maintains a calm and collected demeanor when confronted by an upset patient or patient's family member - During a busy week, demonstrates caring and compassionate behaviors with patients, patients' families, colleagues, and staff members - Advocates for an individual patient's needs in a humanistic and professional manner regarding home care, medication approval, and need for care by another subspecialist - Despite a difficult and demanding situation, continues to work to provide optimal patient care
Level 4 <i>Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in self and others</i> <i>Exhibits a sense of duty to patient care and professional responsibilities</i>	- Recognizes that the resident on your team is sleep deprived and encourages them to use the institution's fatigue policy - Recognizes that a busy oncology service is highly stressful and may lead to losing track of other tasks; proactively completes other administrative and personal tasks before the rotation begins and asks for help when overwhelmed - Models respect and compassion for patients and promotes the same from colleagues by actively identifying positive professional behavior
Level 5 <i>Models professional behavior and coaches others when their behavior fails to meet professional expectations</i>	- During rounds, when residents are noted to be using the term "sickler" to describe patients, coaches residents on how to properly address patients as individuals and not refer to them as a diagnosis - Discusses the need to be on time with a resident who continues to be late, making a plan together to address the underlying issues of why the learner is late

<i>Extends the role of the pediatric hematologist/oncologist beyond the care of patients by engaging with the community, specialty, and medical profession as a whole</i>	• Speaks up in the moment when observing racist/sexist behavior within the health care team and uses reporting mechanisms to address it • Develops education and/or modules on microaggressions and bias
Assessment Models or Tools	• Direct observation • Multisource feedback • Oral or written self-reflection • Simulation
Curriculum Mapping	•
Notes or Resources	• AbdelHameid, Duaa. 2020. "Professionalism 101 for Black Physicians." <i>New England Journal of Medicine</i>. 383(5): e34. doi:10.1056/NEJMp2022773. • American Academy of Pediatrics. "Residency Curriculum: Mental Health Education Resources." https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Mental-Health/Pages/Residency-Curriculum.aspx. Accessed 2020. • American Board of Internal Medicine Foundation, ACP-ASIM Foundation, and European Federation of Internal Medicine. 2002. "Medical Professionalism in the New Millennium: A Physician Charter." <i>Annals of Internal Medicine</i> 136: 243-246. https://doi.org/10.7326/0003-4819-136-3-200202050-00012. • ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • ABP. "Medical Professionalism." https://www.abp.org/content/medical-professionalism. Accessed 2020. • ABP. "Teaching, Promoting, and Assessing Professionalism Across the Continuum: A Medical Educator's Guide." https://www.abp.org/professionalism-guide. Accessed 2020. • American Medical Association. Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. 2020. • Bynny, Richard L., Douglas S. Paauw, Maxine Papadakis, and Sheryl Pfeil. 2017. <i>Medical Professionalism Best Practices: Professionalism in the Modern Era</i>. Aurora, CO: Alpha Omega Alpha Medical Society. https://www.alphaomegalpha.org/wp-content/uploads/2022/01/Monograph2018.pdf. ISBN: 978-1-5323-6516-4. • Domen, Ronald E., Kristen Johnson, Richard Michael Conran, Robert D. Hoffman, Miriam D. Post, Jacob J. Steinberg, Mark D. Brissette, et al. 2016. "Professionalism in Pathology: A Case-Based Approach as a Potential Educational Tool." <i>Archives of Pathology and Laboratory Medicine</i> 141: 215-219. https://doi.org/10.5858/arpa.2016-0217-CP.

- Levinson, Wendy, Shiphra Ginsburg, Frederic W. Hafferty, and Catherine R. Lucey. 2014. *Understanding Medical Professionalism*. New York, NY: McGraw-Hill Education. <https://accessmedicine.mhmedical.com/book.aspx?bookID=1058>.
- Osseo-Asare, Aba, Lilanthi Balasuriya, Stephen J. Huot, et al. 2018. "Minority Resident Physicians' Views on the Role of Race/Ethnicity in Their Training Experiences in the Workplace." *JAMA Network Open*. 1(5): e182723. doi:10.1001/jamanetworkopen.2018.2723.
- Paul, Dereck W. Jr., Kelly R. Knight, Andre Campbell, and Louise Aronson. 2020. "Beyond a Moment - Reckoning with Our History and Embracing Antiracism in Medicine." *New England Journal of Medicine*. 383: 1404-1406. doi:10.1056/NEJMp2021812 <https://www.nejm.org/doi/full/10.1056/NEJMp2021812>.

Professionalism 2: Ethical Principles	
Overall Intent: To recognize and address or resolve common and complex ethical dilemmas or situations	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of the ethical principles underlying informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics</i>	Identifies and applies ethical principles such as justice, “do no harm,” and autonomy that are involved in informed consent
Level 2 <i>Applies ethical principles in common situations</i>	Articulates how the principle of “do no harm” applies to a patient who may not need a lumbar puncture even though it could provide a learning opportunity
Level 3 <i>Analyzes complex situations using ethical principles to address conflict/controversy; seeks help when needed to manage and resolve complex ethical situations</i>	- Offers treatment options for a terminally ill patient, minimizing bias, while recognizing own limitations, and consistently honoring the patient’s and patient’s family’s choice - Works with the social worker to identify barriers and provides support to a single mother who has a daughter with ALL and does not adhere to the medication regimen
Level 4 <i>Manages and seeks to resolve ethical dilemmas using appropriate resources (e.g., ethics consultations, literature review, risk management/legal consultation)</i>	- Appropriately uses ethics resources to discuss end-of-life care of a child in the ICU with multiorgan failure and poor prognosis - Uses institutional resources, including social work and risk management, when a patient’s parent chooses to leave the hospital against medical advice - Engages with a multidisciplinary team to address issues when the patient’s family and physicians disagree on care plan for a patient with brain death; recognizes that prior experiences of racism for the patient and family influence their trust and defers discussion of most complex issues to those in whom the family have demonstrated trust, rather than assuming a hierarchical structure
Level 5 <i>Called upon by others to consult in cases of complex ethical dilemmas; identifies and seeks to address system-level factors that induce or exacerbate</i>	- Participates as part of the ethics consult service, providing guidance for complex cases - Is sought out by residents and other fellows for advice about ethical dilemmas
Assessment Models or Tools	- Direct observation - Multisource feedback - Oral or written self-reflection - Simulation
Curriculum Mapping	
Notes or Resources	American Board of Internal Medicine Foundation, ACP-ASIM Foundation, and European Federation of Internal Medicine. 2002. “Medical Professionalism in the New Millennium: A Physician Charter.” <i>Annals of Internal Medicine</i> 136: 243-246. https://doi.org/10.7326/0003-4819-136-3-200202050-00012.

- ABP. “Entrustable Professional Activities for Subspecialties: Hematology-Oncology.” <https://www.abp.org/content/entrustable-professional-activities-subspecialties>. Accessed 2022.
- American Medical Association. “Ethics.” <https://www.ama-assn.org/delivering-care/ama-code-medical-ethics>. Accessed 2020.
- Bynny, Richard L., Douglas S. Paauw, Maxine Papadakis, and Sheryl Pfeil. 2017. *Medical Professionalism Best Practices: Professionalism in the Modern Era*. Aurora, CO: Alpha Omega Alpha Medical Society. <https://www.alphaomegaalpha.org/wp-content/uploads/2022/01/Monograph2018.pdf>. ISBN: 978-1-5323-6516-4.
- Domen, Ronald E., Kristen Johnson, Richard Michael Conran, Robert D. Hoffman, Miriam D. Post, Jacob J. Steinberg, Mark D. Brissette, et al. 2016. “Professionalism in Pathology: A Case-Based Approach as a Potential Educational Tool.” *Archives of Pathology and Laboratory Medicine* 141: 215-219. <https://doi.org/10.5858/arpa.2016-0217-CP>.
- Levinson, Wendy, Shiphra Ginsburg, Frederic W. Hafferty, and Catherine R. Lucey. 2014. *Understanding Medical Professionalism*. New York, NY: McGraw-Hill Education. <https://accessmedicine.mhmedical.com/book.aspx?bookID=1058>.

Professionalism 3: Accountability/Conscientiousness Overall Intent: To take responsibility for one's own actions and their impact on patients and other members of the health care team	
Milestones	Examples
Level 1 <i>Performs tasks and responsibilities, with prompting</i>	• Responds to reminders from program administrator to complete work hour logs • After being informed by the program director that too many conferences have been missed, changes habits to meet the minimum attendance requirement • Completes patient care tasks (callbacks, consultations, orders) after prompting from a supervisor
Level 2 <i>Performs tasks and responsibilities in a timely manner in routine situations</i>	• Completes administrative tasks (e.g., licensing requirements) by specified due date • Completes routine patient care tasks as assigned • Answers pages and emails promptly with rare need for reminders
Level 3 <i>Performs tasks and responsibilities in a thorough and timely manner in complex or stressful situations</i>	• Identifies multiple competing demands when caring for patients, appropriately triages tasks, and appropriately seeks help from other team members
Level 4 <i>Coaches others to ensure tasks and responsibilities are completed in a thorough and timely manner in complex or stressful situations</i>	• Reminds other fellows to log work hours, gives tips on task prioritization • Supervises residents and/or medical students on a busy night, delegating tasks appropriately, and ensures that all tasks are completed for safe and thorough patient care • Teaches others to make use of task reminder lists in EHR so they can efficiently keep track of their primary patients' care plans
Level 5 <i>Creates strategies to enhance others' ability to efficiently complete tasks and responsibilities</i>	• Meets with multidisciplinary team (e.g., nurses, social worker, case manager) to streamline patient discharges
Assessment Models or Tools	• Compliance with deadlines and timelines • Direct observation • Multisource feedback • Self-evaluations and reflective tools • Simulation
Curriculum Mapping	•
Notes or Resources	• ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • American Medical Association. "Ethics." https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. Accessed 2020. • Code of conduct from fellow/resident institutional manual • Expectations of residency program regarding accountability and professionalism

Professionalism 4: Well-Being	
Overall Intent: To identify resources to manage and improve well-being	
Milestones	Examples
Level 1 <i>Recognizes the importance of addressing personal and professional well-being</i>	• Acknowledges how individual response to delivering bad news impacts well-being and may impact the approach to patients seen later the same day • Discusses the importance of a faculty mentor • Recognizes that personal stress may require a change in schedule
Level 2 <i>Describes institutional resources that are meant to promote well-being</i>	• Identifies well-being resources such as meditation apps and mental health resources for fellows available through the program and institution • Meets with program director to discuss Family Medical Leave Act options when expecting a child
Level 3 <i>Recognizes institutional and personal factors that impact well-being</i>	• Identifies that working in pediatric hematology/oncology may be stressful and impact well-being • Identifies that working during a pandemic is unusually stressful personally and professionally • Recognizes that the two-week night rotation is negatively impacting home life
Level 4 <i>Describes interactions between institutional and personal factors that impact well-being</i>	• Discusses a plan to mitigate the tension between a busy schedule and time with family • Recognizes how microaggressions from coworkers and/or faculty members are impacting performance or engagement in patient care
Level 5 <i>Coaches and supports colleagues to optimize well-being at the team, program, or institutional level</i>	• Leads a team debrief after a stressful, busy shift; shares personal impact of the shift and how plans to decompress • Joins an institutional or graduate medical education committee on clinical well-being
Assessment Models or Tools	• Direct observation • Group interview or discussions for team activities • Oral or written self-reflection
Curriculum Mapping	•
Notes or Resources	• This subcompetency is not intended to evaluate a fellow's well-being, but to ensure each fellow has the fundamental knowledge of factors that impact well-being, the mechanisms by which those factors impact well-being, and available resources and tools to improve well-being. • ACGME. "Well-Being Tools and Resources." https://dl.acgme.org/pages/well-being-tools-resources. Accessed 2022. • ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022.

- | | |
|--|--|
| | <ul style="list-style-type: none">• Hicks, Patricia J., Daniel Schumacher, Susan Guralnick, Carol Carraccio, and Ann E. Burke. 2014. "Domain of Competence: Personal and Professional Development." <i>Academic Pediatrics</i> 14(2 Suppl): S80-97.
https://www.sciencedirect.com/science/article/abs/pii/S187628591300332X.• Local resources, including employee assistance programs |
|--|--|

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication Overall Intent: To establish a therapeutic relationship with patients and their families, tailor communication to the needs of patients and their families, and effectively navigate difficult/sensitive conversations	
Milestones	Examples
Level 1 <i>Demonstrates respect and attempts to establish rapport</i> <i>Attempts to adjust communication strategies based upon patient/family expectations</i>	- Introduces self and faculty member, identifies patient and others in the room, and engages all parties in health care discussion - Identifies need for trained interpreter with non-English-speaking patients - Recognizes the need to avoid medical jargon
Level 2 <i>Establishes a therapeutic relationship in straightforward encounters</i> <i>Adjusts communication strategies as needed to mitigate barriers and meet patient/family expectations</i>	- Prioritizes and sets an agenda based on concerns of patient's parents at the beginning of a clinic visit with a child with a hematologic/oncologic medical problem - Uses nonjudgmental language to discuss sensitive topics - Introduces the concept of a clinical trial and the role of clinical research in the treatment of pediatric cancer
Level 3 <i>Establishes a culturally competent and therapeutic relationship in most encounters</i> <i>Communicates with sensitivity and compassion, elicits patient/family values, and acknowledges uncertainty and conflict</i>	- Prioritizes and sets an agenda based on concerns of patient's parents at the beginning of a bone marrow transplant follow-up visit for a patient with multiple transplant-related complications - Discusses contraception and fertility preservation while promoting trust, respect, and understanding - Recognizes that mispronouncing a patient's name, especially one of a different ethnicity, might be experienced as a microaggression; apologizes to the patient and seeks to correct the mistake - Adjusts elective chemotherapy admissions and transfusions to accommodate religious observances - Acknowledges that rates of enrollment on therapeutic trials are lower in people of color and customizes informed consent process
Level 4 <i>Establishes a therapeutic relationship in straightforward and complex encounters, including those with ambiguity and/or conflict</i> <i>Uses shared decision making with patient/family to make a personalized care plan</i>	- Continues to engage parents who refuse transfusions, reviewing risks/benefits/alternatives to assuage these concerns in a manner that engages rather than alienates the patient's family - Navigates informed consent discussion about a clinical trial when two caregivers do not agree on whether their child should be enrolled - Uses shared decision making to make a plan for future therapy after a rare but serious adverse event such as seizure due to methotrexate toxicity

	• Confronts patients' families respectfully regarding medication non-adherence or medical neglect
Level 5 <i>Mentors others to develop positive therapeutic relationships</i> <i>Models and coaches others in patient- and family-centered communication</i>	• Gives constructive feedback to a resident who is obtaining informed consent for a blood transfusion from a patient and patient's family who are hesitant to accept blood products • Role models how to lead multi-disciplinary care conferences and family meetings • Develops a curriculum on patient- and family-centered communication, including navigating difficult conversations
Assessment Models or Tools	• Direct observation • Multisource feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • Benson, Bradley J. 2014. "Domain of Competence: Interpersonal and Communication Skills." <i>Academic Pediatrics</i> 14(2 Suppl): S55-S65. https://doi.org/10.1016/j.acap.2013.11.016. Accessed 2020. • Laidlaw, Anita, and Jo Hart. 2011. "Communication Skills: An Essential Component of Medical Curricula. Part I: Assessment of Clinical Communication: AMEE Guide No. 51." <i>Medical Teacher</i>. 33(1): 6-8. https://doi.org/10.3109/0142159X.2011.531170. • MedEdPORTAL. "Anti-Racism in Medicine Collection." https://www.mededportal.org/anti-racism. Accessed 2020. • Puscas, Liana, Jennifer R. Kogan, and Eric S. Holmboe. 2021. "Assessing Interpersonal and Communication Skills." <i>Journal of Graduate Medical Education</i> 13(2s): 91–95. https://meridian.allenpress.com/jgme/article/13/2s/91/464384/Assessing-Interpersonal-and-Communication-Skills. • Symons, Andrew B., Andrew Swanson, Denise McGuigan, Susan Orrange, and Elie A Akl. 2009. "A Tool for Self-Assessment of Communication Skills and Professionalism in Residents." <i>BMC Medical Education</i> 9(1). https://doi.org/10.1186/1472-6920-9-1.

Interpersonal and Communication Skills 2: Interprofessional and Team Communication Overall Intent: To communicate effectively with the health care team, including consultants	
Milestones	Examples
Level 1 <i>Respectfully requests a consultation, with guidance</i> <i>Identifies the members of the interprofessional team</i>	• Requests an infectious disease consultation for a patient with prolonged fever, after being prompted by the attending • Acknowledges how the pharmacist contributes to the multidisciplinary team for the patient
Level 2 <i>Clearly and concisely requests consultation by communicating patient information</i> <i>Participates within the interprofessional team</i>	• When requesting a consultation from the infectious disease team, reports relevant clinical information such as patient history and blood culture results • Sends a message in the EHR to child life to ask for guidance on how to collaborate in disclosing a new diagnosis in an age-appropriate way
Level 3 <i>Formulates a specific question for consultation and tailors communication strategy</i> <i>Uses bi-directional communication within the interprofessional team</i>	• Consults the infectious disease team on which antibiotic is most appropriate for the blood or marrow transplant (BMT) patient with multi-drug resistant colonization who has a new fever • Works with case management team to coordinate delivery of home supply of factor replacement following a procedure to ensure safe discharge plan
Level 4 <i>Coordinates consultant recommendations to optimize patient care</i> <i>Facilitates interprofessional team communication</i>	• Implements antibiotic recommendations from infectious disease consultant in a BMT patient, taking into consideration multi-organ dysfunction, including renal failure, with the input of pharmacy to ensure no major drug interactions • Convenes a multi-disciplinary discussion with transfusion medicine, cardiology, and ICU teams about the risk/benefit analysis of adjusting anti-coagulation on an extracorporeal membrane oxygenation (ECMO) patient • Leads the morning interprofessional huddle on the inpatient unit • Effectively navigates racial discrimination or microaggressions from a colleague about a patient with sickle cell disease and frequent pain crises
Level 5 <i>Maintains a collaborative relationship with referring providers that maximizes adherence to practice recommendations</i>	• Works collaboratively with infectious disease and emergency medicine colleagues to create a fever and neutropenia guideline for the hospital

Coaches others in effective communication within the interprofessional team	• Gives real-time feedback and role plays with a medical student, coaching the learner through calling an effective consult • Mediates a conflict among members of the health care team
Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Multi-source feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • ACAPT. "NIPEC Assessment Resources and Tools." https://acapt.org/about/consortium/national-interprofessional-education-consortium-(nipec)/nipec-assessment-resources-and-tools. Accessed 2020. • Dehon, Erin, Kimberly Simpson, David Fowler, and Alan Jones. 2015. "Development of the Faculty 360." <i>MedEdPORTAL</i>. 11:10174. http://doi.org/10.15766/mep_2374-8265.10174. • Fay, David, Michael Mazzone, Linda Douglas, and Bruce Ambuel. 2007. "A Validated, Behavior-Based Evaluation Instrument for Family Medicine Residents." <i>MedEdPORTAL</i>. https://www.mededportal.org/doi/10.15766/mep_2374-8265.622. • François, José. 2011. "Tool to Assess the Quality of Consultation and Referral Request Letters in Family Medicine." <i>Canadian Family Physician</i>. 57(5): 574-575. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093595/. • Green, Matt, Teresa Parrott, and Graham Cook. 2012. "Improving Your Communication Skills." <i>BMJ</i>. 344:e357. https://doi.org/10.1136/bmj.e357. • Henry, Stephen G., Eric S. Holmboe, and Richard M. Frankel. 2013. "Evidence-Based Competencies for Improving Communication Skills in Graduate Medical Education: A Review with Suggestions for Implementation." <i>Medical Teacher</i>. 35(5):395-403. https://doi.org/10.3109/0142159X.2013.769677. • Interprofessional Education Collaborative Expert Panel. 2011. "Core Competencies for Interprofessional Collaborative Practice: Report of an Expert Panel." Washington, D.C.: Interprofessional Education Collaborative. https://www.aacom.org/docs/default-source/insideome/ccrpt05-10-11.pdf?sfvrsn=77937f97_2. • Puscas, Liana, Jennifer R. Kogan, and Eric S. Holmboe. 2021. "Assessing Interpersonal and Communication Skills." <i>Journal of Graduate Medical Education</i> 13(2s): 91–95. https://meridian.allenpress.com/jgme/article/13/2s/91/464384/Assessing-Interpersonal-and-Communication-Skills.

- | | |
|--|---|
| | <ul style="list-style-type: none">• Roth, Christine G., Karen W. Eldin, Vijayalakshmi Padmanabhan, and Ellen M. Freidman. 2019. "Twelve Tips for the Introduction of Emotional Intelligence in Medical Education." <i>Medical Teacher</i>. 41(7): 1-4.
https://www.tandfonline.com/doi/full/10.1080/0142159X.2018.1481499. |
|--|---|

Interpersonal and Communication Skills 3: Communication within Health Care Systems Overall Intent: To effectively communicate using a variety of tools and methods	
Milestones	Examples
Level 1 <i>Records accurate information in the patient record</i> <i>Identifies the importance of and responds to multiple forms of communication (e.g., in-person, electronic health record (EHR), telephone, email)</i>	• Documents accurate patient history after seeing a new outpatient referral in clinic • If using copy/paste/forward, makes updates to the consult follow-up note, including an updated physical exam and consultant recommendations • Recognizes that members of the care team may communicate by EHR, pager, telephone, or email and understands the responsibility for signing into and checking the various modalities of communication
Level 2 <i>Records accurate and timely information in the patient record</i> <i>Selects appropriate method of communication, with prompting</i>	• After seeing patients in clinic, signs and routes accurate notes to the attending in a timely manner, compliant with institutional standards • Avoids biased or stigmatized language in notes by using the term “opioid medication” rather than “narcotics” in patient presentations and notes • Places a STAT interventional radiology consult for limb-threatening thrombus; requires prompting from attending to establish direct verbal communication with the appropriate team
Level 3 <i>Concisely documents updated, prioritized, diagnostic and therapeutic reasoning in the patient record</i> <i>Aligns type of communication with message to be delivered (e.g., direct and indirect) based on urgency and complexity</i>	• Focuses clinic note on the specific referral question of neutropenia and provides rationale for evaluation and treatment, including history of infections, antibiotic use, and thorough physical exam, including oral mucosa and skin; documentation lacks contingency planning for what to do when the child has a fever • When a patient begins to decompensate on the general hematology-oncology floor, knows how to alert the appropriate team for escalation of care (e.g., rapid response team (RRT), code blue) and immediately contacts the attending • Emails patient's cardiologist with non-urgent question rather than paging cardiologist on call • Places a STAT interventional consult for limb-threatening thrombus and independently follows up with direct verbal communication
Level 4 <i>Documents diagnostic and therapeutic reasoning, including anticipatory guidance</i>	• Writes clinic note that focuses on the specific referral question of neutropenia and provides rationale for evaluation and treatment, including history of infections, antibiotic use and thorough physical exam, including oral mucosa and skin; documentation includes contingency planning for what to do when the child has a fever

<i>Demonstrates exemplary written and verbal communication</i>	• For the clinic referral patient with neutropenia, discusses contingency plans with the patient's family and includes in the note indications for bone marrow aspirate/biopsy • Sees new patient referral for menorrhagia in clinic, discusses the patient with the attending, follows up on the von Willebrand labs, and communicates results and plan to the patient's family and referring physician • Ensures closed-loop communication with the referring physician following the hospital admission for a patient with new diagnosis of leukemia
Level 5 Models and coaches others in documenting diagnostic and therapeutic reasoning	• Reviews residents' daily progress notes and gives them constructive feedback to help improve the quality of their communication
<i>Coaches others in written and verbal communication</i>	• Leads a team to discuss implementation and dissemination of updated patient information in the EHR
Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Multisource feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• ABP. "Entrustable Professional Activities for Subspecialties: Hematology-Oncology." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. • Benson, Bradley J. 2014. "Domain of Competence: Interpersonal and Communication Skills." <i>Academic Pediatrics</i> 14(2 Suppl): S55-S65. https://doi.org/10.1016/j.acap.2013.11.016. Accessed 2020. • Bierman, Jennifer A., Kathryn Kinner Hufmeyer, David T. Liss, A. Charlotta Weaver, and Heather L. Heiman. 2017. "Promoting Responsible Electronic Documentation: Validity Evidence for a Checklist to Assess Progress Notes in the Electronic Health Record." <i>Teaching and Learning in Medicine</i>. 29(4): 420-432. https://doi.org/10.1080/10401334.2017.1303385. • Haig, Kathleen M., Staci Sutton, and John Whittington. 2006. "SBAR: A Shared Mental Model for Improving Communications Between Clinicians." <i>Joint Commission Journal on Quality and Patient Safety</i>. 32(3):167-75. https://doi.org/10.1016/s1553-7250(06)32022-3. • Puscas, Liana, Jennifer R. Kogan, and Eric S. Holmboe. 2021. "Assessing Interpersonal and Communication Skills." <i>Journal of Graduate Medical Education</i> 13(2s): 91–95. https://meridian.allenpress.com/jgme/article/13/2s/91/464384/Assessing-Interpersonal-and-Communication-Skills.

- | | |
|--|---|
| | <ul style="list-style-type: none">• Starmer, Amy J., Nancy D. Spector, Rajendu Srivastava, April D. Allen, Christopher P. Landrigan, Theodore Sectish, and I-PASS Study Group. 2012. "I-Pass, a Mnemonic to Standardize Verbal Handoffs." <i>Pediatrics</i> 129.2:201-204.
https://doi.org/10.1542/peds.2011-2966. |
|--|---|

Interpersonal and Communication Skills 4: Complex Communication around Serious Illness Overall Intent: To sensitively and effectively communicate about serious illness with patients and their families/caregivers	
Milestones	Examples
Level 1 <i>Recognizes when a topic may be challenging when communicating with patients and their families</i>	• Recognizes importance of communicating prognosis to facilitate shared decision making, but is unable to do so independently • Arranges new diagnosis talk with patient and family, ensuring that the family's requested support system and interpreter are available
Level 2 <i>Assesses patients' and patients' families' situational awareness and identifies preferences for receiving challenging information</i>	• Using open-ended questions and appropriate pauses, determines a patient's/family's understanding of prognosis and preferences for learning outcome data • Recognizes the need to discuss with a patient's family changing goals of care based on clinical status • Recognizes the emotional impact of hair loss as a sequela of chemotherapy
Level 3 <i>Communicates challenging information and attends to emotional responses of patients and patients' families</i>	• Initiates a multidisciplinary discussion regarding the need to call child protective services when a patient has "no-showed" for three consecutive chemotherapy appointments and then communicates that decision to the patient's family • Compassionately communicates a new relapse to a patient coming in for routine off-therapy care • Remains calm and responds compassionately when a patient's family has an unexpected emotional response upon hearing their child needs a transfusion
Level 4 <i>Anticipates needs of patients and their families and tailors communication according to the situation, emotional response, and medical uncertainty</i>	• Adjusts communication with patient's family/caregivers to address uncertainty following a stroke after polyethylene glycol (PEG) in induction for leukemia • Engages family of a child along with other members of the multispecialty care team in determining family wishes and expectations regarding resuscitative efforts in a patient with midline pontine glioma in the event of an acute deterioration • Considers the autonomy of an adolescent patient with relapsed disease who no longer wants to seek curative therapy, despite the parents' wishes
Level 5 <i>Coaches others in the communication of challenging information</i>	• Serves as a role model in leading multidisciplinary care conferences • Creates a teaching session for medical students on breaking bad news
Assessment Models or Tools	• Direct observation • Objective structured clinical examination • Multisource feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• Back, Anthony, Robert Arnold, and James Tulskey. 2009. <i>Mastering Communication with Seriously Ill Patients</i>. Cambridge: Cambridge University Press.

- Back, Anthony L., Robert M. Arnold, Walter F. Baile, James A. Tulsky, and Kelly Fryer-Edwards. 2005. "Approaching Difficult Communication Tasks in Oncology." *CA: A Cancer Journal for Clinicians* 55(3):164-77. <https://doi.org/10.3322/canjclin.55.3.164>.
- Childers, Julie W., Anthony L. Back, James A. Tulsky, and Robert M. Arnold. 2017. "REMAP: A Framework for Goals of Care Conversations." *Journal of Oncology Practice*. 13(10):e 844-e850. doi: 10.1200/JOP.2016.018796.
- Levetown, Marcia, and American Academy of Pediatrics Committee on Bioethics. 2008. "Communicating with Children and Families: From Everyday Interactions to Skill in Conveying Distressing Information." *Pediatrics* 121(5):e1441-60. <https://doi.org/10.1542/peds.2008-0565>.
- Puscas, Liana, Jennifer R. Kogan, and Eric S. Holmboe. 2021. "Assessing Interpersonal and Communication Skills." *Journal of Graduate Medical Education* 13(2s): 91–95. <https://meridian.allenpress.com/jgme/article/13/2s/91/464384/Assessing-Interpersonal-and-Communication-Skills>.
- VitalTalk. www.vitaltalk.org. Accessed 2018.

To help programs transition to the new version of the Milestones, the ACGME has mapped the original Milestones 1.0 to the new Milestones 2.0. Indicated below are the subcompetencies that are similar between versions. These are not exact matches, but are areas that include similar elements. Not all subcompetencies map between versions. Inclusion or exclusion of any subcompetency does not change the educational value or impact on curriculum or assessment.

Milestones 1.0	Milestones 2.0
PC1: Provide transfer of care that ensures seamless transitions	SBP4: System Navigation for Patient-Centered Care – Transitions in Care
PC2: Make informed diagnostic and therapeutic decisions that result in optimal clinical judgement	PC1: History and Physical Examination PC3: Clinical Reasoning MK4: Diagnostic Evaluation
PC3: Develop and carry out management plans	PC4: Patient Management ICS1: Patient- and Family-Centered Communication
PC4: Provide appropriate role modeling	PBLI2: Reflective Practice and Commitment to Personal Growth
	PC3: Organize and Prioritize Patient Care
	PC5: Competence in Procedures
MK1: Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems	PBLI1: Evidence Based and Informed Practice
	MK1: Oncology
	MK2: Hematology
	MK3: Bone Marrow Transplant/Cellular Therapy
SBP1: Work effectively in various health care delivery settings and systems relevant to their clinical specialty	SBP3: System Navigation for Patient Centered Care – Coordination of Care SBP6: Physician Role in Health Care Systems
SBP2: Coordinate patient care within the health care system relevant to their clinical specialty	SBP3: System Navigation for Patient Centered Care – Coordination of Care SBP4: System Navigation for Patient-Centered Care – Transitions in Care SBP5: Population and Community Health ICS1: Patient- and Family-Centered Communications ICS2: Interprofessional and Team Communication
SBP3: Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate	SBP5: Population and Community Health SBP6: Physician Role in Health Care Systems

SBP4: Work in inter-professional teams to enhance patient safety and improve patient care quality	SBP1: Patient Safety ICS2: Interprofessional and Team Communication
SBP5: Participate in identifying system errors and implementing potential systems solutions	SBP1: Patient Safety SBP2: Quality Improvement
PBL11: Identifying strengths, deficiencies, and limits to one's knowledge and expertise	PBL11: Evidence Based and Informed Practice PBL12: Reflective Practice and Commitment to Personal Growth
PBL12: Systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement	SBP2: Quality Improvement PBL12: Reflective Practice and Commitment to Personal Growth
PBL13: Use information technology to optimize learning and care delivery	PBL11: Evidence Based and Informed Practice PBL12: Reflective Practice and Commitment to Personal Growth ICS3: Communication within Health Care Systems
PBL14: Participate in the education of patients, families, students, residents, fellows, and other health professionals	SBP5: Population and Community Health PBL11: Evidence Based and Informed Practice ICS1: Patient- and Family-Centered Communications
PROF1: Professional Conduct: High standards of ethical behavior which includes maintaining appropriate professional boundaries	PROF1: Professional Behavior PROF2: Ethical Principles
PROF2: Trustworthiness that makes colleagues feel secure when one is responsible for the care of patients	PBL11: Evidence Based and Informed Practice PROF1: Professional Behavior PROF3: Accountability/Conscientiousness ICS1: Patient- and Family-Centered Communications
PROF3: Provide leadership skills that enhance team functioning, the learning environment, and/or the health care delivery system/environment with the ultimate intent of improving care of patients	ICS2: Interprofessional and Team Communication ICS3: Communication within Health Care Systems PROF2: Ethical Principles PROF3: Accountability/Conscientiousness
PROF4: The capacity to accept that ambiguity is part of clinical medicine and to recognize the need for and to utilize appropriate resources in dealing with uncertainty	PROF2: Ethical Principles ICS1: Patient- and Family-Centered Communication PBL11: Evidence Based and Informed Practice
	PROF4: Well-Being
ICS1: Communicate effectively with physicians, other health professionals, and health-related agencies	ICS2: Interprofessional and Team Communication ICS3: Communication within Health Care Systems
ICS2: Work effectively as a member or leader of a health care team or other professional group	ICS2: Interprofessional and Team Communication PBL12: Reflective Practice and Commitment to Personal Growth PROF3: Accountability/Conscientiousness

ICS3: Act in a consultative role to other physicians and health professionals	PC3: Clinical Reasoning ICS2: Interprofessional and Team Communication ICS3: Communication within Health Care Systems
	ICS4: Complex Communication Around Serious Illness/Difficult Conversations

Available Milestones Resources

Milestones 2.0: Assessment, Implementation, and Clinical Competency Committees Supplement, 2021 - <https://meridian.allenpress.com/jgme/issue/13/2s>

Milestones Guidebooks: <https://www.acgme.org/milestones/resources/>

- *Assessment Guidebook*
- *Clinical Competency Committee Guidebook*
- *Clinical Competency Committee Guidebook Executive Summaries*
- *Implementation Guidebook*
- *Milestones Guidebook*

Milestones Guidebook for Residents and Fellows: <https://www.acgme.org/residents-and-fellows/the-acgme-for-residents-and-fellows/>

- *Milestones Guidebook for Residents and Fellows*
- *Milestones Guidebook for Residents and Fellows Presentation*
- *Milestones 2.0 Guide Sheet for Residents and Fellows*

Milestones Research and Reports: <https://www.acgme.org/milestones/research/>

- *Milestones National Report*, updated each fall
- *Milestones Predictive Probability Report*, updated each fall
- *Milestones Bibliography*, updated twice each year

Developing Faculty Competencies in Assessment courses - <https://www.acgme.org/meetings-and-educational-activities/courses-and-workshops/developing-faculty-competencies-in-assessment/>

Assessment Tool: Direct Observation of Clinical Care (DOCC) - <https://dl.acgme.org/pages/assessment>

Assessment Tool: Teamwork Effectiveness Assessment Module (TEAM) - <https://team.acgme.org/>

Improving Assessment Using Direct Observation Toolkit - <https://dl.acgme.org/pages/acgme-faculty-development-toolkit-improving-assessment-using-direct-observation>

Remediation Toolkit - <https://dl.acgme.org/courses/acgme-remediation-toolkit>

Learn at ACGME has several courses on Assessment and Milestones - <https://dl.acgme.org/>