Supplemental Guide:
Pediatric Infectious Diseases

ACGME

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Pediatric Infectious Diseases 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 obtain an appropriate history and perform a comprehensive and targeted physical exam to provide accurate diagnosis	
Milestones	**Examples**
Level 1 *Acquires a foundational history for common infectious diseases and syndromes* *Performs a foundational, developmentally appropriate physical examination*	● Obtains a thorough yet concise infectious diseases history, including past medical history, environmental exposures, travel and sexual history, immunizations, and medications ● Performs a thorough yet concise physical exam
Level 2 *Acquires a complete history, including specific host and environmental factors* *Performs an examination that elicits common or straightforward infectious diseases and syndromes*	● Reports a comprehensive travel history in a patient with fever and a rash ● Examines all central line sites in an intensive care unit (ICU) patient ● Examines mucosal sites in a patient with febrile neutropenia
Level 3 *Acquires a detailed history, incorporating pertinent supplemental information* *Performs an examination that elicits uncommon or complicated infectious diseases and syndromes*	● Calls outside laboratory to obtain updated culture data for a transferred patient, and includes this data in the history ● Comments on presence or absence of Osler's nodes on a patient with bloodstream infection, prompting concern for endocarditis
Level 4 *Acquires history that incorporates epidemiology, past clinical data, and nuances specific for age, immune status, and exposures* *Performs a tailored examination that elicits subtle findings of infectious diseases and syndromes*	● In a case of suspected culture-negative endocarditis, reviews outside hospital medical records in detail to determine if antibiotics were administered prior to obtaining cultures ● Elicits previous history of residence in Brazil and recommends Strongyloides serologies for a patient being evaluated prior to transplant ● Notices subtle skin lesions in a patient with neutropenic fever, prompting consideration for disseminated fungal infection
Level 5 *Serves as a role model in obtaining a history that identifies subtle details and resolves ambiguity in the patient history* *Serves as a role model who has mastered the art of examination that helps in making a definitive diagnosis*	● Conducts a seminar with junior colleagues focused on subtle history and physical exam findings in patients with uncommon zoonoses • Demonstrates to medical students the pertinent findings of the physical exam and how it confirmed the diagnosis • Notes an engorged tick on the scalp of a patient with ataxia and ascending paralysis, leading to the diagnosis of tick paralysis

Assessment Models or Tools	● American Board of Pediatrics (ABP) in-training exam (ITE) ● Assessment of case conference presentations ● Direct observation ● End-of-rotation evaluations ● Medical record (chart) audit ● Multisource feedback ● Standardized patients
Curriculum Mapping	●
Notes or Resources	● Bennett, John E., Raphael Dolin, and Martin J. Blaser. 2015. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases.* 8th ed. Elsevier. https://www.sciencedirect.com/book/9781455748013/mandell-douglas-and-bennetts-principles-and-practice-of-infectious-diseases. ● Cherry, James, Gail J. Demmler-Harrison, Sheldon L. Kaplan, William J. Steinbach, and Peter J. Hotez. 2019. *Feigin and Cherry's Textbook of Pediatric Infectious Diseases.* 8th ed. Elsevier. https://www.us.elsevierhealth.com/feigin-and-cherrys-textbook-of-pediatric-infectious-diseases-9780323376921.html. ● Committee on Infectious Diseases, American Academy of Pediatrics, David W. Kimberlin, Elizabeth D. Barnett, Ruth Lynfield, and Mark H. Sawyer. 2021. *Red Book: 2021-2024 Report of the Committee on Infectious Diseases*. 32nd ed. American Academy of Pediatrics. https://publications.aap.org/redbook/book/347/Red-Book-2021-2024. ● Long, Sarah S., Charles G. Prober, Marc Fischer, and David Kimberlin. 2022. *Principles and Practice of Pediatric Infectious Diseases.* 6th ed. Elsevier. https://www.us.elsevierhealth.com/principles-and-practice-of-pediatric-infectious-diseases-9780323756082.html.

Patient Care 2: Organization and Prioritization of Patient Care **Overall Intent:** To organize and appropriately prioritize patient needs to optimize patient outcomes	
Milestones	**Examples**
Level 1 *Organizes patient care tasks, with assistance*	● Recommends cell fluid analysis and cultures for a child with suspected septic arthritis, when prompted ● Recommends empiric antibiotics for a child with suspected osteomyelitis after consulting with supervising attending
Level 2 *Organizes routine patient care tasks but needs assistance for patients with complex disease; recognizes urgent or emergent issues*	● When evaluating a child with osteomyelitis and a second consult for an unstable patient with fever and neutropenia arrives, evaluates the patient with neutropenia first and provides management recommendations with assistance from supervisor ● Recommends empirical antimicrobials for a patient with sepsis and a history of colonization with multiresistant bacteria with assistance from supervisor
Level 3 *Prioritizes and triages patient care tasks with efficiency; anticipates and responds to urgent and emergent issues*	● Independently prioritizes communicating recommendations for synovial fluid analysis and culture prior to an anticipated arthrocentesis that will occur imminently
Level 4 *Prioritizes and delegates patient care responsibilities, including contingency planning, even when patient volume and complexity approach the capacity of the individual or facility*	• After a neonate in the neonatal intensive care unit (NICU) is diagnosed with varicella, mobilizes consult team to evaluate and provide preventive care to other patients and staff • While pre-rounding, receives six new consults, organizes the team effectively, and delegates responsibilities, without assistance • Organizes patient rounding around the scheduling of the interpreter to ensure good communication with the patient and patient's family
Level 5 *Serves as a role model and coach for organizing, prioritizing, and managing patient care tasks*	● After initial stabilization of patient with presumed bacterial meningitis, reviews care as well as teaching points with the resident, and checks in with the nurse and patient's family members for further questions
Assessment Models or Tools	● Direct observation ● End-of-rotation evaluations ● Multisource feedback ● Self-assessment
Curriculum Mapping	●
Notes or Resources	● The American Board of Pediatrics (ABP). "Entrustable Professional Activities for Subspecialties: Infectious Diseases." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022.

Patient Care 3: Diagnostic Reasoning **Overall Intent:** To incorporate patient-specific factors in deciding upon diagnostic strategies; to recognize progressively more complex and rare diagnoses in appropriate patients and sources of diagnostic error	
Milestones	**Examples**
Level 1 *Integrates limited patient data to generate a narrow differential diagnosis*	● Applies travel and sexual history, environmental exposures, medications, and immune status to generate the differential diagnosis
Level 2 *Formulates a differential diagnosis using detailed patient-specific data*	● Includes pneumocystis pneumonia, tuberculosis, cryptococcus, and endemic mycoses on the differential diagnosis for an immune compromised patient; also includes irrelevant diagnoses ● Recognizes that tuberculosis, strongyloidiasis, and other chronic infections can be an important part of the differential diagnosis in patients who have previously lived outside the US in areas endemic for these infections
Level 3 *Formulates a prioritized differential diagnosis and demonstrates the ability to modify a diagnosis based on a patient's clinical course and additional data*	● Places pneumocystis pneumonia lower on the differential diagnosis for an immune compromised patient with subacute cough due to the presence of pleural effusions and lymphadenopathy on chest imaging ● Recognizes that an invasive fungal infection has moved higher on the differential diagnosis in a patient with fever and neutropenia who has not defervesced after seven days of broad-spectrum antibacterials
Level 4 *Formulates a tailored differential diagnosis to include atypical presentations and uncommon or newly emerging disorders; recognizes and avoids sources of diagnostic error*	● In a stem cell transplant recipient with fever and respiratory failure, considers opportunistic infections, drug reactions, graft versus host disease (GvHD). and other non-infectious complications in formulating the differential diagnosis ● Identifies the different types of individual and system factors that lead to diagnostic errors ● When a patient does not improve as expected, urges the team to review the case and consider alternative diagnoses (avoiding anchoring bias)
Level 5 *Role models and coaches diagnostic reasoning and navigating diagnostic uncertainty*	● Articulates clinical reasoning in a way that allows insight into an expert's clinical decision making ● Discusses use of broad-based polymerase chain reaction (PCR) on a tissue biopsy on a severely immunocompromised patient to quickly and cost effectively arrive at the diagnosis; considering limitations in interpreting the test, identifies contamination as a potential issue which could lead to diagnostic errors
Assessment Models or Tools	● ABP subspecialty ITE ● Assessment of case conference presentations ● Direct observation ● End-of-rotation evaluations ● Medical record (chart) review ● Mini-CEX or structured clinical observation ● Multisource feedback

	● Multiple choice questions
Curriculum Mapping	●
Notes or Resources	● ABP. “Entrustable Professional Activities for Subspecialties: Infectious Diseases.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. ● Anderson, Jordan D., Vincent T. Ho, Kyle T. Wright, Bruce D. Levy, and Joseph Loscalzo. 2020. “Parroting Lymphoma.” *New England Journal of Medicine* 383: 1376-1381. https://doi.org/10.1056/NEJMcps1915728. ● Bennett, John E., Raphael Dolin, and Martin J. Blaser. 2015. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 8th ed. Elsevier. https://www.sciencedirect.com/book/9781455748013/mandell-douglas-and-bennetts-principles-and-practice-of-infectious-diseases. ● Bowen, Judith L. 2006. “Educational Strategies to Promote Clinical Diagnostic Reasoning.” *NEJM* 355: 2217-2225. https://www.nejm.org/doi/full/10.1056/NEJMra054782. ● Committee on Infectious Diseases, American Academy of Pediatrics, David W. Kimberlin, Elizabeth D. Barnett, Ruth Lynfield, and Mark H. Sawyer. 2021. *Red Book: 2021-2024 Report of the Committee on Infectious Diseases*. 32nd ed. American Academy of Pediatrics. https://publications.aap.org/redbook/book/347/Red-Book-2021-2024. ● Infectious Diseases Society of America (IDSA). “IDSA Practice Guidelines.” https://www.idsociety.org/practice-guideline/practice-guidelines/#/+/0/date_na_dt/desc/. Accessed 2022. ● NEJM Clinical Problem-Solving Cases: https://www.nejm.org/medical-articles/clinical-problem-solving. Accessed 2022. ● Schumacher, Daniel J., Robert Englander, Patricia J. Hicks, Carol Carraccio, and Susan Guralnick. 2014. “Domain of Competence: Patient Care.” *Academic Pediatrics* 14(2) 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. ● UpToDate. https://www.uptodate.com/home. Accessed 2022.

Patient Care 4: Consultative Care **Overall Intent:** To provide comprehensive consultation for patients with signs and symptoms of infection	
Milestones	**Examples**
Level 1 *Identifies the clinical questions, with assistance*	● Calls the resident who requested the consultation to clarify the clinical question after talking with the infectious disease attending, who points out that further information is needed to understand the correct clinical question
Level 2 *Clarifies the clinical questions; provides recommendations to the primary team, with assistance*	● Receives question regarding antibiotic treatment of methicillin-resistant *Staphylococcus aureus* (MRSA) central line-associated bloodstream infection (CLABSI) and discusses with the attending, who helps fellow provide immediate recommendations of the need for line removal in addition to antimicrobials to the primary service
Level 3 *Seeks and integrates input from different members of the health care team and provides recommendations to the primary team in a clear and timely manner*	● Confirms dose adjustment of vancomycin with the pharmacist and conveys this to the team prior to the next dose
Level 4 *Provides comprehensive and prioritized recommendations, including assessment, rationale, and anticipatory guidance to all relevant health care team members*	● Triages a patient going for a lymph node biopsy and provides recommendations on type of testing needed prior to going to operating room, followed by empiric antibiotic treatment; explains clinical decision to primary team on rounds
Level 5 *Leads the health care team in the provision of effective consultative services across the spectrum of disease complexity and acuity*	● When called about a case of severe malaria overnight, calls pharmacy and Centers for Disease Control and Prevention (CDC) to provide appropriate treatment, and communicates with the admitting team to provide a contingency plan
Assessment Models or Tools	● American Academy of Pediatrics (AAP) PREP Infectious Diseases (ID) ● ABP subspecialty ITE ● Assessment of case conference presentations ● Direct observation ● End-of-rotation evaluations ● Medical record (chart) review ● Structured clinical observation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● ABP. “Entrustable Professional Activities for Subspecialties: Infectious Diseases.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022.

	● Anderson, Jordan D., Vincent T. Ho, Kyle T. Wright, Bruce D. Levy, and Joseph Loscalzo. 2020. “Parroting Lymphoma.” *New England Journal of Medicine* 383: 1376-1381. https://doi.org/10.1056/NEJMcps1915728. ● Bennett, John E., Raphael Dolin, and Martin J. Blaser. 2015. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 8th ed. Elsevier. https://www.sciencedirect.com/book/9781455748013/mandell-douglas-and-bennetts-principles-and-practice-of-infectious-diseases. ● Bowen, Judith L. 2006. “Educational Strategies to Promote Clinical Diagnostic Reasoning.” *NEJM* 355: 2217-2225. https://www.nejm.org/doi/full/10.1056/NEJMra054782. ● Chang, Dennis, and Erin Gabriel. 2015. “10 Tips for Hospitalists to Achieve an Effective Medical Consult.” *The Hospitalist.* https://www.the-hospitalist.org/hospitalist/article/122225/10-tips-hospitalists-achieve-effective-medical-consult. Accessed 2020. ● IDSA. “IDSA Practice Guidelines.” https://www.idsociety.org/practice-guideline/practice-guidelines/#/+/0/date_na_dt/desc/. Accessed 2022. ● NEJM Clinical Problem-Solving Cases: https://www.nejm.org/medical-articles/clinical-problem-solving. Accessed 2022. ● Schumacher, Daniel J., Robert Englander, Patricia J. Hicks, Carol Carraccio, and Susan Guralnick. 2014. “Domain of Competence: Patient Care.” *Academic Pediatrics* 14(2) 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. ● UpToDate. https://www.uptodate.com/home. Accessed 2022.

Patient Care 5: Management of Patients with Possible and Proven Infectious Diseases **Overall Intent:** To develop comprehensive management plans for patients with infections	
Milestones	**Examples**
Level 1 *Develops an initial management plan for patients with low-complexity conditions, with assistance*	● Recommends starting acyclovir for treatment of neonatal herpes simplex virus (HSV), accounting for central nervous system (CNS) involvement
Level 2 *Develops initial and follow-up management plans for patients with low-complexity conditions*	● Proposes monitoring for side effects of acyclovir, including complete blood count and creatinine ● Counsels patient's family on the need for suppressive therapy for six months after neonatal HSV
Level 3 *Develops an initial and follow-up plan for patients with moderate-complexity conditions and adjusts the plan over the course of clinical care*	● Offers acyclovir prophylaxis for a patient undergoing bone marrow transplantation who is known to be HSV IgG+ ● Recommends monitoring of cytomegalovirus (CMV) PCRs for a child who received stem cells from a CMV-positive donor, and provides team with recommendations about therapy based on changes in CMV levels over time
Level 4 *Develops a comprehensive management plan, including contingency plans for patients with complex conditions*	● Advises the primary team on management of neutropenia complicating treatment for CMV DNAemia with ganciclovir; discusses the relative risks and benefits of pausing therapy, decreasing immune suppression, and/or administering granulocyte colony stimulating factor (G-CSF) in the context of this specific individual
Level 5 *Develops tailored management plans for all patients, regardless of the complexity of the condition, and incorporates diagnostic uncertainty*	● In an 11-year-old child who received a bone marrow transplant and has been noted to have rising CMV DNAemia despite treatment with ganciclovir, recommends viral susceptibility testing and considers salvage therapy with letermovir or foscarnet while awaiting results
Assessment Models or Tools	● Assessment of case conference presentations ● Clinical reasoning exercises ● Direct observation ● End-of-rotation evaluations ● Medical record (chart) audit ● Multisource feedback ● Multiple choice questions
Curriculum Mapping	●
Notes or Resources	● Cherry, James, Gail J. Demmler-Harrison, Sheldon L. Kaplan, William J. Steinbach, and Peter J. Hotez. 2019. *Feigin and Cherry's Textbook of Pediatric Infectious Diseases.* 8th ed. Elsevier. https://www.us.elsevierhealth.com/feigin-and-cherrys-textbook-of-pediatric-infectious-diseases-9780323376921.html.

	● Committee on Infectious Diseases, American Academy of Pediatrics, David W. Kimberlin, Elizabeth D. Barnett, Ruth Lynfield, and Mark H. Sawyer. 2021. *Red Book: 2021-2024 Report of the Committee on Infectious Diseases*. 32nd ed. American Academy of Pediatrics. https://publications.aap.org/redbook/book/347/Red-Book-2021-2024. ● IDSA. "IDSA Practice Guidelines." https://www.idsociety.org/practice-guideline/practice-guidelines/#/+/0/date_na_dt/desc/. Accessed 2022. ● Long, Sarah S., Charles G. Prober, Marc Fischer, and David Kimberlin. 2022. *Principles and Practice of Pediatric Infectious Diseases.* 6th ed. Elsevier. https://www.us.elsevierhealth.com/principles-and-practice-of-pediatric-infectious-diseases-9780323756082.html. ● Pediatric Infectious Diseases Society. "Transplant and Immunocompromised Host ID Modules." https://pids.org/transplant-immunocompromised-host-id/.

Medical Knowledge 1: Pathophysiology and Foundational Science **Overall Intent:** To understand and apply principles of pathophysiology and foundational science to infectious diseases problems	
Milestones	**Examples**
Level 1 *Demonstrates basic knowledge of pathophysiology and foundational science of common infectious diseases*	● Recognizes that humoral and cell-mediated adaptive and innate immunity have a role in host response to infections ● Recognizes that osteomyelitis occurs predominantly through hematogenous spread
Level 2 *Demonstrates advanced knowledge of pathophysiology and foundational science of common infectious diseases and host response*	● Understands how impaired T-cell function contributes to development of pneumocystis pneumonia ● Understands the role of the IL-12/interferon-gamma pathway in the pathogenesis of mycobacterial infections
Level 3 *Applies advanced knowledge of pathophysiology and foundational science to common infectious diseases and host response*	● Recommends expanded diagnostic evaluation for fungal and mycobacterial infections for a patient with fever who is receiving a tumor necrosis factor (TNF)-alpha inhibitor therapy ● Explains the reason for recommending prophylactic antifungals to patients who recently received bone marrow transplants
Level 4 *Applies advanced knowledge of pathophysiology and foundational science to uncommon, new, and emerging infectious diseases and host response*	● Recommends dengue vaccine only for patients who are seropositive for dengue in order to avoid antibody-dependent enhancement of infection if contracted after immunization ● Applies updated guidelines to management recommendations for emerging infections
Level 5 *Serves as a peer expert for the application of advanced knowledge of pathophysiology and foundational science to infectious diseases and host response*	● Uses basic science literature to help develop or update protocols for diagnosis and treatment of novel infections or multidrug-resistant pathogens
Assessment Models or Tools	● AAP PREP ID ● Assessment of presentation (lectures, clinical rounds, etc.) ● Direct observation (e.g., clinical rounds) ● End-of-rotation evaluations ● ITE ● Medical record (chart) audit ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● ABP. “Entrustable Professional Activities for Subspecialties: Infectious Diseases.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. ● Cherry, James, Gail J. Demmler-Harrison, Sheldon L. Kaplan, William J. Steinbach, and Peter J. Hotez. 2019. Feigin and Cherry’s Textbook of Pediatric Infectious Diseases. 8th

	ed. Elsevier. https://www.us.elsevierhealth.com/feigin-and-cherrys-textbook-of-pediatric-infectious-diseases-9780323376921.html. ● Committee on Infectious Diseases, American Academy of Pediatrics, David W. Kimberlin, Elizabeth D. Barnett, Ruth Lynfield, and Mark H. Sawyer. 2021. *Red Book: 2021-2024 Report of the Committee on Infectious Diseases*. 32nd ed. American Academy of Pediatrics. https://publications.aap.org/redbook/book/347/Red-Book-2021-2024. ● Englander, Robert, and Carol Carraccio. 2014. "Domain of Competence: Medical Knowledge." *Academic Pediatrics* 14(2)Supp: S36-S37. https://www.sciencedirect.com/science/article/abs/pii/S1876285913003240. ● IDSA. "IDSA Practice Guidelines." https://www.idsociety.org/practice-guideline/practice-guidelines/#/+/0/date_na_dt/desc/. Accessed 2022. ● Long, Sarah S., Charles G. Prober, Marc Fischer, and David Kimberlin. 2022. *Principles and Practice of Pediatric Infectious Diseases.* 6th ed. Elsevier. https://www.us.elsevierhealth.com/principles-and-practice-of-pediatric-infectious-diseases-9780323756082.html. ● Riedel, Stefan, Jeffery A. Hobden, Steve Miller, Stephen A. Morse, Timothy A. Mietzner, Barbara Detrick, Thomas G. Mitchell, Judy A. Sakanari, Peter Hotez, and Rojelio Mejia. 2019. *Jawetz, Melnick, and Adelberg's Medical Microbiology.* 28th ed. McGraw Hill. https://accessmedicine.mhmedical.com/book.aspx?bookID=2629. ● Steinbach, William J., Michael D. Green, Marian G. Michaels, Lara A. Danzinger-Isakov, and Brian T. Fisher. 2021. *Pediatric Transplant and Oncology Infectious Diseases.* Philadelphia: Elsevier.

Medical Knowledge 2: Diagnostic Evaluation and Stewardship (consideration of priorities, risks, benefits, costs, and consequences) **Overall Intent:** To apply appropriate diagnostic evaluation and practice diagnostic stewardship	
Milestones	**Examples**
Level 1 *Demonstrates foundational knowledge of diagnostic evaluation for pathogens and clinical syndromes*	● Recognizes that PCR testing is used to detect some viruses ● Recognizes that blood cultures should be collected prior to antibiotic administration ● Understands that a respiratory multiplex PCR test does not provide antimicrobial susceptibility information ● Understands the use and limitations of a white blood cell count when evaluating for infections ● Recognizes limitations of serology for HIV in neonates and children under 18 months
Level 2 *Demonstrates basic knowledge of diagnostic evaluation and stewardship, and interpretation of results to common pathogens and clinical syndromes*	● Justifies the need for serial blood cultures in the management of *Staphylococcus aureus* bacteremia to prove sterilization ● Identifies the importance of both specific and non-specific serologic testing to diagnose and stage syphilis ● Identifies that a PCR result for mecA indicates methicillin resistance ● Recognizes utility and limitations of multiplex PCR panels in diagnosing lower respiratory infections ● Appropriately recommends when echocardiography is needed in the setting of fever of unknown origin
Level 3 *Applies knowledge of diagnostic evaluation and stewardship, and interpretation of results to uncommon pathogens and clinical syndromes*	● Recognizes that serology is used to support a diagnosis of suspected brucellosis ● Tailors diagnostic evaluation to patient's epidemiologic risk factors ● Recognizes the challenge in interpretation of cerebrospinal fluid (CSF) analysis in a traumatic lumbar puncture ● Recognizes what tests to order from CSF to help diagnose meningoencephalitis based on exposure
Level 4 *Applies advanced knowledge of diagnostic evaluation and stewardship, including performance characteristics and limitations, and interpretation of results to a broad spectrum of clinical scenarios*	● Discusses positive predictive value of a PCR for *Clostridioides difficile* in children ● Understands how to apply interferon gamma release assays versus tuberculin skin test (TST) in the evaluation for tuberculosis exposure in children born in foreign countries and history of bacille Calmette-Guérin (BCG) vaccine ● Understands when to ask microbiology lab to add on extended spectrum antimicrobial susceptibility testing ● Understands the limitations of serologic testing in immunocompromised patients
Level 5 *Serves as a peer expert for diagnostic evaluations and stewardship*	● Lectures medical students, residents, and peers about diagnostic evaluation when providing consultation recommendations ● Creates a multidisciplinary system to encourage diagnostic stewardship for molecular tests with high costs or unproven diagnostic yield

Assessment Models or Tools	● AAP PREP ID ● ABP subspeciality ITE ● Assessment of case conference presentations ● Direct observation ● End-of-rotation evaluations ● Medical record (chart) review ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Bennett, John E., Raphael Dolin, and Martin J. Blaser. 2015. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases.* 8th ed. Elsevier. https://www.sciencedirect.com/book/9781455748013/mandell-douglas-and-bennetts-principles-and-practice-of-infectious-diseases. ● Cherry, James, Gail J. Demmler-Harrison, Sheldon L. Kaplan, William J. Steinbach, and Peter J. Hotez. 2019. *Feigin and Cherry's Textbook of Pediatric Infectious Diseases.* 8th ed. Elsevier. https://www.us.elsevierhealth.com/feigin-and-cherrys-textbook-of-pediatric-infectious-diseases-9780323376921.html. ● IDSA. "IDSA Practice Guidelines." https://www.idsociety.org/practice-guideline/practice-guidelines/#/+/0/date_na_dt/desc/. Accessed 2022. ● Long, Sarah S., Charles G. Prober, Marc Fischer, and David Kimberlin. 2022. *Principles and Practice of Pediatric Infectious Diseases.* 6th ed. Elsevier. https://www.us.elsevierhealth.com/principles-and-practice-of-pediatric-infectious-diseases-9780323756082.html. ● Steinbach, William J., Michael D. Green, Marian G. Michaels, Lara A. Danzinger-Isakov, and Brian T. Fisher. 2021. *Pediatric Transplant and Oncology Infectious Diseases.* Philadelphia: Elsevier.

Medical Knowledge 3: Treatment Including Source Control, Anti-Infectives, Immunoprophylaxis, and Adjunctive Therapies **Overall Intent:** To develop comprehensive treatment plans	
Milestones	**Examples**
Level 1 *Demonstrates basic knowledge of common anti-infectives, including dosing, spectrum of activity, contraindications, and clinical indications*	● Recognizes that penicillin is the drug of choice for the treatment of beta-hemolytic streptococci ● Recognizes high-dose amoxicillin as indicated dose for community-acquired pneumonia in children ● Understands why to avoid use of trimethoprim/sulfamethoxazole (TMP-SMX) in a patient with sulfa allergies ● Understands why to generally avoid live-virus vaccines in immunocompromised patients
Level 2 *Demonstrates knowledge of common treatments, including consideration of pharmacokinetics and pharmacodynamics*	● Recognizes that ertapenem does not have activity against *Pseudomonas aeruginosa* ● Recognizes that fluoroquinolones have a black box warning for causing tendinopathy ● Recognizes when antimicrobial prophylaxis is indicated for various states of immunosuppression ● Understands that pharmacokinetics and pharmacodynamics include monitoring, adverse effects, resistance mechanisms, drug interactions, and relative effectiveness
Level 3 *Applies knowledge of treatments to straightforward patient scenarios*	● Discusses risk and benefits of latent tuberculosis infection (LTBI) treatment regimes in children ● Uses the HIV genotype result to help guide antiretroviral selection in patients who have resistance ● Recommends post-exposure prophylaxis vaccination for varicella exposure in unvaccinated children
Level 4 *Applies knowledge of treatments to complex patient scenarios*	● Avoids administration of divalent cations when prescribing fluroquinolones in patients receiving continuous enteral feeding ● Recommends continuous intravenous (IV) infusion of nafcillin for patient with persistent methicillin-susceptible *Staphylococcus aureus* (MSSA) bacteremia to optimize the property of time-dependent killing ● Uses a carbapenem when expression of the CTX-M gene in an *E. coli* is identified from a blood culture ● Recommends antimicrobial prophylaxis for various states of immunosuppression ● Analyzes drug levels to establish therapeutic concentrations in patients being treated with voriconazole for invasive aspergillosis
Level 5 *Serves as a peer expert for application of treatments to all patient scenarios*	● In a teaching session to the residents, links the class and mechanism of action of a drug to its antimicrobial effect, spectrum of activity, toxicities, and microbial mechanisms that confer resistance to the drug

	● Works with institution to develop a pathway for treatment of multidrug-resistant urinary tract infections in children ● Assists team members in accessing treatment under emergency investigational new drug (eIND)/emergency use authorization (EUA) mechanisms ● Teaches the transplant team that close monitoring and dose adjustments in immunosuppression will be required when starting or stopping voriconazole
Assessment Models or Tools	● AAP PREP ID ● ABP subspecialty ITE ● Assessment of case conference presentations ● Direct observation ● End-of-rotation evaluations ● Medical record (chart) audit ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Bennett, John E., Raphael Dolin, and Martin J. Blaser. 2015. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases.* 8th ed. Elsevier. https://www.sciencedirect.com/book/9781455748013/mandell-douglas-and-bennetts-principles-and-practice-of-infectious-diseases. ● Cherry, James, Gail J. Demmler-Harrison, Sheldon L. Kaplan, William J. Steinbach, and Peter J. Hotez. 2019. *Feigin and Cherry's Textbook of Pediatric Infectious Diseases.* 8th ed. Elsevier. https://www.us.elsevierhealth.com/feigin-and-cherrys-textbook-of-pediatric-infectious-diseases-9780323376921.html. ● Johns Hopkins Medicine. "Johns Hopkins Antibiotic Guide." https://www.hopkinsguides.com/hopkins/index/Johns_Hopkins_ABX_Guide/All_Topics/A. Accessed 2022. ● IDSA. "IDSA Practice Guidelines." https://www.idsociety.org/practice-guideline/practice-guidelines/#/+/0/date_na_dt/desc/. Accessed 2022. ● Long, Sarah S., Charles G. Prober, Marc Fischer, and David Kimberlin. 2022. *Principles and Practice of Pediatric Infectious Diseases.* 6th ed. Elsevier. https://www.us.elsevierhealth.com/principles-and-practice-of-pediatric-infectious-diseases-9780323756082.html. ● Sanford Guide. "Sanford Guide to Antimicrobial Therapy." https://www.sanfordguide.com/. Accessed 2022. ● Shapiro, R. 2019. "Transplant Infectious Diseases Guidelines." *Clinical Transplantation*. 33(9). https://www.myast.org/education/publications/infectious-diseases-guidelines-4th-edition.

	● Steinbach, William J., Michael D. Green, Marian G. Michaels, Lara A. Danzinger-Isakov, and Brian T. Fisher. 2021. *Pediatric Transplant and Oncology Infectious Diseases.* Philadelphia: Elsevier.

Medical Knowledge 4: Infection Control/Prevention and Epidemiology **Overall Intent:** To understand and apply principles of infection control/prevention and epidemiology	
Milestones	**Examples**
Level 1 *Demonstrates basic knowledge of the principles of infection prevention and epidemiology*	● Understands the difference between droplet and airborne precautions ● Understands the definition of an outbreak ● Understands that a case-control study can be used in outbreak investigations
Level 2 *Applies concepts of infection prevention measures and epidemiology to common clinical scenarios*	● Recommends droplet precautions in cases of suspected *Neisseria meningitidis* meningitis ● Recommends airborne precautions in patients with suspected tuberculosis
Level 3 *Applies knowledge of infection prevention measures and epidemiology to uncommon clinical scenarios*	● Notifies laboratory personnel when sending respiratory samples in suspected coccidioidomycosis evaluations ● Notifies infection preventionist of cases of CLABSI or surgical site infection ● Notifies local public health department of cases of suspected Mpox virus
Level 4 *Serves as a resource to other health care practitioners and patients regarding infection prevention practices and epidemiology*	● Teaches interdisciplinary team members the rationale behind avoidance of live vaccines for a period of time after administration of intravenous immunoglobulin ● Teaches residents about global impact of diarrhea on pediatric mortality
Level 5 *Demonstrates leadership in infection prevention practices and/or responding to epidemiological events*	● Serves as an active member of hospital infection prevention or antimicrobial stewardship committees ● Leads an investigation of a cluster of *Stenotrophomonas* pneumonia infections in the ICU
Assessment Models or Tools	● AAP PREP questions ● ABP ITE ● Assessment of case conference presentations ● Direct observation ● End-of-rotation evaluations ● Medical record (chart) review ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Bennett, John E., Raphael Dolin, and Martin J. Blaser. 2015. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases.* 8th ed. Elsevier. https://www.sciencedirect.com/book/9781455748013/mandell-douglas-and-bennetts-principles-and-practice-of-infectious-diseases. ● IDSA. "IDSA Practice Guidelines." https://www.idsociety.org/practice-guideline/practice-guidelines/#/+/0/date_na_dt/desc/. Accessed 2022. ● The Society for Healthcare Epidemiology of America (SHEA). https://www.shea-online.org. Accessed 2022. ● SHEA Fellow's Course. https://learningce.shea-online.org/. Accessed 2022.

Medical Knowledge 5: Public Health **Overall Intent:** To understand and interpret public health guidelines and policies	
Milestones	**Examples**
Level 1 *Identifies examples of public health agencies*	● Understands the roles of the CDC and local and state health departments as resources for public health guidelines and policies
Level 2 *Recognizes the public health impact of infectious disease and identifies resources*	● Appropriately triages and orders diagnostic tests for a potential tuberculosis case ● Ensures that the local health department has been informed about an infant who has a salmonella infection
Level 3 *Applies public health guidance to individual patients*	• Recommends chemoprophylaxis for household exposures, close contacts, and health care personnel for meningococcemia cases • Works with a pediatrician to complete a vaccine adverse event reporting system (VAERS) report for a patient with a post-vaccine reaction
Level 4 *Applies public health guidance to specific situations in institutions or community settings*	● Provides recommendations to a community practitioner regarding isolation, management, and reporting requirements for reportable diseases ● Organizes system to report post-COVID-19 vaccine myocarditis cases in the institution
Level 5 *Serves as a resource for public health guidance in institutions or communities*	● Partakes in or leads an outbreak investigation for an *E. coli* O157 outbreak in a local daycare ● Partakes in or leads an outbreak investigation for a norovirus outbreak in the hospital ● Uses social media to disseminate information about a recent local outbreak ● Provides written communication to the community for post-COVID-19 vaccine myocarditis
Assessment Models or Tools	● Chart review ● Direct observation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● CDC. https://www.cdc.gov. Accessed 2022. ● Committee on Infectious Diseases, American Academy of Pediatrics, David W. Kimberlin, Elizabeth D. Barnett, Ruth Lynfield, and Mark H. Sawyer. 2021. *Red Book: 2021-2024 Report of the Committee on Infectious Diseases*. 32nd ed. American Academy of Pediatrics. https://publications.aap.org/redbook/book/347/Red-Book-2021-2024. ● US Food and Drug Administration (FDA). https://www.fda.gov/. Accessed 2022.

Medical Knowledge 6: Antimicrobial Stewardship **Overall Intent:** To understand and apply principles of antimicrobial stewardship	
Milestones	**Examples**
Level 1 *Demonstrates basic knowledge of the principles of antimicrobial stewardship and local antibiograms*	● Recognizes that overuse of antimicrobials leads to unnecessary toxicity and resistance ● Knows the local resistance rates of clindamycin for MRSA
Level 2 *Implements antimicrobial stewardship recommendations for routine situations*	● Recommends de-escalation from piperacillin-tazobactam to cefazolin in patients with MSSA bacteremia ● Recommends cessation of antimicrobials in patients with asymptomatic bacteriuria or viral pneumonia
Level 3 *Implements antimicrobial stewardship recommendations for complex situations*	• Discusses stopping antibiotics in a critically ill patient in the ICU who has no evidence of a bacterial infection • Discusses narrowing antibiotic coverage in a previously healthy patient with uncomplicated acute hematogenous culture-negative osteomyelitis
Level 4 *Serves as a resource to health care practitioners, patients, and the community for antimicrobial stewardship concepts*	● Teaches medical students appropriate empiric antibiotic choices for pediatric urinary tract infections (UTIs) ● Counsels families about the importance of not starting antibiotics for viral infections
Level 5 *Demonstrates leadership in antimicrobial stewardship initiatives*	● Is involved in the development of a hospital-wide clinical practice guideline for pediatric uncomplicated UTIs ● Coordinates institutional audit and feedback program to reduce unnecessary use of critical antimicrobials
Assessment Models or Tools	● AAP PREP ID ● ABP ITE ● Assessment of case conference presentations ● Direct observation ● End-of-rotation evaluations ● Medical record (chart) review ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Bennett, John E., Raphael Dolin, and Martin J. Blaser. 2015. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases.* 8th ed. Elsevier. https://www.sciencedirect.com/book/9781455748013/mandell-douglas-and-bennetts-principles-and-practice-of-infectious-diseases. ● IDSA. “IDSA Practice Guidelines.” https://www.idsociety.org/practice-guideline/practice-guidelines/#/+/0/date_na_dt/desc/. Accessed 2022. ● SHEA. https://www.shea-online.org/. Accessed 2022.

	● SHEA Fellow's Course https://learningce.shea-online.org/. Accessed 2022.

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 *Demonstrates knowledge of common patient safety events* *Demonstrates knowledge of how to report patient safety events*	● 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 *Identifies system factors that lead to patient safety events* *Reports patient safety events through institutional reporting systems (simulated or actual)*	● 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 *Participates in analysis of patient safety events (simulated or actual)* *Participates in disclosure of patient safety events to patients and families (simulated or actual)*	● Participates in department morbidity and mortality presentations ● 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 vaccine dosing error to the patient's family
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)* *Discloses patient safety events to patients and families (simulated or actual)*	● Serves as a subject matter expert for a simulated or actual root cause analysis related to a patient's exposure to measles in the hospital and develops an action plan that includes re-education of staff members, appropriate isolation, and use of triage protocols ● Following consultation with risk management and other team members, leads the discussion with a patient's family regarding a delay in antimicrobial dose adjustment based on drug level results
Level 5 *Actively engages teams and processes to modify systems to prevent patient safety events* *Role models or mentors others in the disclosure of patient safety events*	● Leads a multidisciplinary team to work on improved medication reconciliation processes to prevent discharge medication errors and considers biases amongst team members ● Conducts a simulation demonstrating techniques and approaches for disclosing patient safety events
Assessment Models or Tools	● Case-based discussion ● Direct observation ● E-module multiple choice tests

	● Guided reflection ● Medical record (chart) review ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● ABP. “Entrustable Professional Activities for Subspecialties: Infectious Diseases.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. ● Institute for Healthcare Improvement. http://www.ihi.org. Accessed 2022. ● 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. *Medical Education* 39(12): 1195-204. https://pubmed.ncbi.nlm.nih.gov/16313578/.

Systems-Based Practice 2: Quality Improvement **Overall Intent:** To understand and implement quality improvement methodologies to improve patient care	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of basic quality improvement methodologies and metrics*	● Understands that a patient safety error should be submitted to the local electronic reporting system ● Describes a PDSA (Plan, Do, Study, Act) cycle
Level 2 *Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate)*	● Describes an initiative in the infectious diseases clinic to improve influenza vaccination rates
Level 3 *Participates in local quality improvement initiatives*	● Participates in hospital audit and feedback effort to optimize judicious use of vancomycin
Level 4 *Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project*	● Develops and implements a quality improvement project to improve human papillomavirus (HPV) vaccination rates within a practice site, including 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 the patient population
Level 5 *Creates, implements, and assesses quality improvement initiatives at the institutional or community level*	● Initiates and completes a quality improvement project to improve county HPV vaccination rates in collaboration with the county health department and shares results through a formal presentation to community leaders ● Collaborates with EHR team to create an order prompt to improve clinic vaccination rates
Assessment Models or Tools	● AAP PREP ID ● Direct observation ● ITE exam ● Poster or other presentation ● Quality improvement portfolio ● Team evaluations
Curriculum Mapping	●
Notes or Resources	● ABP. “Entrustable Professional Activities for Subspecialties: Infectious Diseases.” 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 2022. ● Institute for Healthcare Improvement. https://www.ihi.org/. Accessed 2022.

	● 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.” *Current Treatment Options in Pediatrics*. 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 *Lists the various interprofessional individuals involved in the patient's care coordination*	● For a patient with HIV, identifies the members of the multidisciplinary team and their roles
Level 2 *Coordinates care of patients in routine clinical situations, incorporating interprofessional teams with consideration of patient and family needs*	● Coordinates home health and subspecialty care for a child with a postoperative wound infection who is being seen in the infectious disease clinic ● Identifies access to care and insurance coverage as social determinants of health
Level 3 *Coordinates care of patients in complex clinical situations, effectively utilizing the roles of interprofessional teams, and incorporating patient and family needs and goals*	● For a patient with intracranial abscess secondary to maxillary dental infection who resides in a rural area where home health is not available, coordinates outpatient administration of intravenous antibiotics ● Works with the social worker to coordinate outpatient care and ensure appropriate infectious diseases clinic follow-up for a patient with tuberculosis ● Refers patients to a local pharmacy that offers alternative formulations of antimicrobials, such as suspensions, for a child who cannot take tablets ● Involves a social worker or case manager in finding community resources for members of historically marginalized communities who may have additional barriers to access
Level 4 *Coordinates interprofessional, patient-centered care among different disciplines and specialties, actively assisting families in navigating the health-care system*	● For a patient with intracranial abscess secondary to maxillary dental infection who resides in a rural area, assists with access to preventive dental services ● Works with the social worker to coordinate outpatient care and ensure appropriate infectious diseases clinic follow-up for the entire family of a patient with tuberculosis ● 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, the primary care physician, etc.
Level 5 *Coaches others in interprofessional, patient-centered care coordination*	● Presents to others the steps taken to develop a new walk-in vaccination program ● Leads an initiative to educate residents about multidisciplinary and psychosocial support for adolescents living with HIV, ensuring inclusion of discussion on health care disparities ● Teaches others to create electronic reminders to ensure important pending laboratory tests are followed up after patients' hospital discharge
Assessment Models or Tools	● Direct observation and level of supervision for entrustable professional activities ● Medical record (chart) audit ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● AAP. https://www.aap.org/en/. Accessed 2022.

	● ABP. “Entrustable Professional Activities for Subspecialties: Infectious Diseases.” 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. AMA Education Consortium: Health Systems Science, 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.” *Mayo Clinic Proceedings: Innovations, Quality & Outcomes*. 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 *Uses a standard template for transitions of care/hand-offs*	● When handing off to colleagues for the weekend, 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 *Adapts a standard template, recognizing key elements for safe and effective transitions of care/hand-offs in routine clinical situations*	● Routinely uses a standardized hand-off for a stable patient, verbalizes a basic understanding of active problems, and provides basic contingency plans
Level 3 *Performs safe and effective transitions of care/hand-offs in complex clinical situations, and ensures closed-loop communication*	● Performs the hand-off for a patient with a complex diagnosis from the pediatric ICU to another fellow with a succinct summary by problem or system and a timeline for outpatient follow-up and repeat testing, with clearly delineated responsibilities
Level 4 *Performs and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems, including transitions to adult care*	● Seeks out appropriate adult infectious disease practitioner to facilitate the transition of a 20-year-old patient living with HIV and complex health care needs to adult care; ensures a thorough hand-off, including the patient's cultural preferences and social needs, to the identified new adult practitioners
Level 5 *Coaches others in improving transitions of care within and across health care delivery systems to optimize patient outcomes*	● Designs and implements standardized hand-off exercises for medical students prior to the start of their clinical rotations
Assessment Models or Tools	● Indirect and direct observation ● I-PASS assessment checklist ● Multisource feedback ● Objective structured clinical examination (OSCE)/Simulation ● Review of sign-out tools, use and review of checklists
Curriculum Mapping	●
Notes or Resources	● ABP. "Entrustable Professional Activities for Subspecialties: Infectious Diseases." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. ● GotTransition. "Clinician Education and Resources." https://www.gottransition.org/resources-and-research/clinician-education-resources.cfm. Accessed 2020. ● 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." *Simulation in Healthcare*. 13(4): 233-238. DOI: 10.1097/SIH.0000000000000322.

	● Society for Adolescent Health and Medicine. “Transition to Adulthood for Youth with Chronic Conditions and Special Health Care Needs.” *Journal of Adolescent Health* 66(5): P631-634. https://doi.org/10.1016/j.jadohealth.2020.02.006. ● 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.” *New England Journal of Medicine*. 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 *Demonstrates awareness of population and community health needs and disparities*	● Identifies adverse childhood experiences and social determinants of health, such as poverty and structural racism
Level 2 *Identifies specific population and community health needs and disparities; identifies local resources*	● Screens patients for adverse childhood experiences and acknowledges social determinants of health for individual patients
Level 3 *Uses local resources effectively to meet the needs and reduce health disparities of a patient population and community*	● Promotes to patients the local resources and programs aimed at eliminating structural racism and improving health disparities ● Works with case manager to arrange transportation for a patient's clinical appointment
Level 4 *Adapts practice to provide for the needs of and reduce health disparities of a specific population*	● Participates in an advocacy project to improve health care access and/or decrease practices that support structural racism ● Arranges for daily availability of interpreter services for patients with limited English proficiency ● Works with information technology group to create after-visit summaries in Spanish for most common infectious disease diagnoses
Level 5 *Advocates at the local, regional, or national level for populations and communities with health care disparities*	● Partners with a community organization working to increase vaccination rates for a particular group ● Participates in longitudinal discussions with local, state, or national government policy makers to eliminate structural racism and reduce health disparities around HIV care
Assessment Models or Tools	● Analysis of process and outcomes measures based on social determinants of health and resultant disparities ● Indirect and direct observation ● Medical record (chart) review ● Multisource feedback
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=2.268230030.1236819861.1654476607-929400881.1619626826&_gac=1.229642574.1651085941.cj0kcqjw06otbhc_arisaau1yovdcxkc8cjmzqntgqmfsj0_flej6v7e95sxi3exmdjyivnt1vv9rxoaamnzealw_wcb. Accessed 2022.

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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 *Engages with patients and other providers in discussions about cost-conscious care and key components of the health care delivery system*	● Considers the differences in cost for a patient in the hospital versus being closely followed as an outpatient ● Considers that insurance coverage, or lack of coverage, can affect prescription drug availability/cost for individual patients ● Identifies that one's own implicit biases contribute to disparities and less-than-optimal care
Level 2 *Identifies the relationships between the delivery system and cost-conscious care and the impact on the patient care*	● Considers the patient's prescription drug coverage when choosing an antibiotic for drug-resistant UTI ● Ensures that a patient hospitalized with acute osteomyelitis has access to follow-up care at discharge
Level 3 *Discusses the need for changes in clinical approaches based on evidence, outcomes, and cost-effectiveness to improve care for patients and families*	● Decides not to order a respiratory viral panel when it will not change management ● Adapts plan to minimize costs and provide appropriate care ● Coordinates telehealth and local pediatric care for a patient who cannot easily return to ID clinic for follow-up care
Level 4 *Advocates for the promotion of safe, quality, and high-value care*	● Works collaboratively to identify audiology services for a patient with congenital CMV and limited resources ● Discusses with pediatrician limitations of rapid streptococcal antigen testing for patients with group A *Streptococcus* colonization
Level 5 *Coaches others to promote safe, quality, and high-value care across health care systems*	● Raises awareness at a systems level to promote cost-conscious care by coaching a practice to implement AAP Choosing Wisely recommendations ● Leads team members in conversations around care gaps for pre-exposure prophylaxis (PrEP) for LGBTQIA+ teens and creates team plans to provide comprehensive care in a clinic
Assessment Models or Tools	● Direct and indirect observation ● Medical record (chart) audit ● Patient satisfaction data ● Patient safety conference participation
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 2022. ● AAP. Practice Management. https://www.aap.org/en/practice-management/. Accessed 2022.

	● ABP. “Entrustable Professional Activities for Subspecialties: Infectious Diseases.” 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 2022. ● 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.” *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. https://doi.org/10.31478/201703e. ● Crow, Byron, Sami G. Tahhan, Curtis Lacy, Jule Grzankowski, and Juan N. Lessing. 2020. “Things We Do for No Reason™: Routine Correction of Elevated INR and Thrombocytopenia Prior to Paracentesis in Patients with Cirrhosis.” *Journal of Hospital Medicine*. 16(2): 102-104. https://doi.org/10.12788/jhm.3458. ● Solutions for Patient Safety. “Hospital Resources.” https://www.solutionsforpatientsafety.org/for-hospitals/hospital-resources/. Accessed 2020.

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 *Develops an answerable clinical question and demonstrates how to access available evidence, with guidance*	● Identifies a question but needs guidance to focus it into a searchable question in PICO (Patient/Problem, Intervention, Comparison and Outcome) format ● Uses general medical resources (i.e., background information) such as UpToDate or DynaMed to search for answers ● Uses Infectious Diseases Society of America (IDSA) guidelines to review treatment options for a patient with a skin and soft tissue infection
Level 2 *Independently articulates clinical question and accesses available evidence*	● Clearly identifies a focused, answerable question: "What are the indications for VARIZIG in a neonate exposed to varicella?" ● Uses PubMed to search for the answer to a clinical question
Level 3 *Locates and applies the evidence, integrated with patient preference, to the care of patients*	● Obtains, appraises, and applies evidence to determine optimal initial therapy in osteomyelitis based on age and most likely organisms ● Efficiently searches key databases, retrieving information that is specific to the clinical question, and filters for highest level of evidence
Level 4 *Critically appraises and applies evidence, even in the face of uncertainty and conflicting evidence to guide care tailored to the individual patient*	● Routinely seeks out and applies evidence to the care of individual patients or populations to change (or re-evaluate) own clinical practice ● Elicits patient's prior experiences regarding diversity, equity, and inclusion in the health care system to start conversations about optimal management, considering patient preference ● Integrates best practices while taking into account the preferences of patients and their families ● Determines utility of immunoglobulin in a patient who presents with presumed viral myocarditis
Level 5 *Coaches others to critically appraise and apply evidence for complex patients*	● Participates in the development of clinical guidelines/pathways ● Mentors junior fellows or residents in critiquing articles during journal club
Assessment Models or Tools	● Clinical evaluations from ID attendings ● Direct observation to inform Milestones and level of supervision for entrustable professional activities ● Presentation evaluation
Curriculum Mapping	●
Notes or Resources	● ABP. "Entrustable Professional Activities for Subspecialties: Infectious Diseases." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022.

	● Duke University. “Evidence-Based Practice.” https://guides.mclibrary.duke.edu/ebm. Accessed 2020. ● Guyatt, Gordon, Drummond Rennie, Maureen O. Meade, and Deborah Cook. 2015. *Users’ Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice*, 3rd ed. USA: McGraw-Hill Education. https://jamaevidence.mhmedical.com/Book.aspx?bookId=847. Accessed 2020. ● University of Canberra Library. “PICO Framework and the Question Statement.” https://canberra.libguides.com/c.php?g=599346&p=4149722. Accessed 2022. ● 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 *Participates in feedback sessions* *Develops personal and professional goals, with assistance*	● Prior to feedback session, drafts individualized learning plan to identify broad goals which are focused during the meeting with the fellowship director ● Identifies professional interest in antibiotic stewardship after mentorship meeting
Level 2 *Demonstrates openness to feedback and performance data* *Designs a learning plan based on established goals, feedback, and performance data, with assistance*	● Acknowledges concerns about timely note completion and works with attending physician to develop goals for improvement ● Devises a plan to explore biases and how they impact professional relationships and patient care
Level 3 *Seeks and incorporates feedback and performance data episodically* *Designs and implements a learning plan by analyzing and reflecting on the factors which contribute to gap(s) between performance expectations and actual performance*	● After receiving feedback on timely note completion, schedules check-in time with attending physician to review improvement to ensure goals are met ● Recognizes own implicit biases that affected care for a transgender male seeking access to PrEP, and takes steps to mitigate bias ● Identifies difficulty remembering Gram-negative resistance mechanisms and dedicates self-study time to this concept
Level 4 *Seeks and incorporates feedback and performance data consistently* *Adapts a learning plan using long-term professional goals, self-reflection, and performance data to measure its effectiveness*	● Establishes a weekly goal with the attending physician and actively requests feedback ● Actively seeks out conferences to learn about anti-racism and bystander culture
Level 5 *Role models and coaches others in seeking and incorporating feedback and performance data* *Demonstrates continuous self-reflection and coaching of others on reflective practice*	● Leads a divisional discussion about opportunities to improve care for patients with limited English proficiency ● Meets with learners to review practice habits and develop their learning goals
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: Infectious Diseases." 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." *Academic Pediatrics.* 14(2): S38-S54. DOI: https://doi.org/10.1016/j.acap.2013.11.018. ● 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." *Academic Medicine*. 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." *Academic Medicine*. 88(10):1558-1563. DOI: 10.1097/ACM.0b013e3182a352e6. ● Sabin, Janice A. 2022. "Tackling Implicit Bias in Health Care." *New England Journal of Medicine* 387:105-107 DOI: 10.1056/NEJMp2201180. https://www.nejm.org/doi/full/10.1056/NEJMp2201180. ● UK General Medical Council. "The Reflective Practitioner: Guidance for Doctors and Medical Students. https://www.gmc-uk.org/education/standards-guidance-and-curricula/guidance/reflective-practice/the-reflective-practitioner---guidance-for-doctors-and-medical-students. Accessed 2022.

Professionalism 1: Professional Behavior **Overall Intent:** To demonstrate ethical and professional behaviors, promote these behaviors in others, and to use appropriate resources to manage professional dilemmas	
Milestones	**Examples**
Level 1 *Identifies expected professional behaviors and potential triggers for lapses* *Identifies the value and role of pediatric infectious disease specialist as a vocation/career*	● Asks a supervising attending physician for feedback on overnight call interactions with colleagues after realizing own tendency to be curt when tired ● Acknowledges the importance of pediatric infectious diseases specialists in informing the public about vaccinations
Level 2 *Demonstrates professional behavior with occasional lapses* *Demonstrates accountability for patient care as a pediatric infectious disease specialist, with guidance*	● Is late to morning rounds, identifies this lapse, and immediately apologizes to peers and attendings upon arrival ● Responds to patient portal message regarding a medication refill after being prompted by the clinic nurse
Level 3 *Maintains professional behavior in increasingly complex or stressful situations* *Fully engages in patient care and holds oneself accountable*	● Despite a busy day on the consult service, spends adequate time at bedside for a patient with complex health care needs ● 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 ● Completes a prior authorization form for a restricted medication
Level 4 *Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in self and others* *Exhibits a sense of duty to patient care and professional responsibilities*	● Speaks up in the moment when observing racist/sexist behavior within the health care team, and uses reporting mechanisms to address it ● Without prompting, assists colleagues with seeing patients when the clinic is busy
Level 5 *Models professional behavior and coaches others when their behavior fails to meet professional expectations* *Extends the role of the pediatric infectious disease specialist beyond the care of patients by engaging with the community, specialty, and medical profession as a whole*	● Discusses the need to be on time with a resident on an infectious diseases elective who continues to be late, making a plan together to address the underlying issues of why the learner is late ● Advocates for process improvement to help patients with limited English proficiency access care resources; works with language services and information technology to develop after-visit summaries in the common languages used by patients in the region ● Develops education and/or modules on microaggressions and bias
Assessment Models or Tools	● Direct observation

	● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Below are resources that define professionalism and seek to focus it on what key knowledge, skills, and attitudes are required to ensure public trust and promote integrity within the profession. It is important to note a historical context in which the informal and formal assessment of "professionalism" has extended beyond these ideals to negatively impact the careers of women, LGBTQIA+ people, and underrepresented minorities in medicine. Explicitly, examples of this have included the way in which women, minoritized learners, and LGBTQIA+ learners have been targeted for certain forms of self-expression of racial, ethnic, or gender identity. The assessment of professionalism should seek to be anti-racist and eliminate all forms of bias. ● AbdelHameid, Duaa. 2020. "Professionalism 101 for Black Physicians." New England Journal of Medicine. 383(5): e34. doi:10.1056/NEJMpv2022773. ● Alexis, Dominique A., Matthew D. Kearney, J. Corey Williams, Chang Xu, Eve J. Higginbotham, and Jaya Aysola. 2020. "Assessment of Perceptions of Professionalism among Faculty, Trainees, Staff, and Students in a Large University-Based Health System." *JAMA Network Open* 3(11):e2021452. doi:10.1001/jamanetworkopen.2020.21452. ● AAP. "Resident 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." *Annals of Internal Medicine* 136: 243-246. https://doi.org/10.7326/0003-4819-136-3-200202050-00012. ● ABP. "Entrustable Professional Activities for Subspecialties: Infectious Diseases." 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. 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. ● Chen, Candice, and Andrea Anderson. "How Should Health Professionalism Be Redefined to Address Health Equity?" *AMA Journal of Ethics* 23, no. 3 (March 1, 2021): 265–70. https://doi.org/10.1001/amajethics.2021.265. ● 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. ● 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 *Demonstrates knowledge of the ethical principles underlying informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics*	● Identifies ethical principles involved in the recruitment of patients for a study of a new antimicrobial agent
Level 2 *Applies ethical principles in common situations*	● Navigates confidential sexually transmitted infection (STI) testing for an adolescent
Level 3 *Analyzes complex situations using ethical principles to address conflict/controversy; seeks help when needed to manage and resolve complex ethical situations*	● Weighs treatment options for a terminally ill patient with an extensively drug-resistant bacterial infection and no IV access; helps to determine the most appropriate therapy to facilitate discharge to home, honoring the child's family's wishes
Level 4 *Manages and seeks to resolve ethical dilemmas using appropriate resources (e.g., ethics consultations, literature review, risk management/legal consultation)*	● Involves institutional resources, including social work and risk management, when a patient's parent chooses to leave the hospital against medical advice, and works to ensure that all parties are treated with respect despite the stressful nature of the situation ● Uses appropriate resources to inform the discussion about disclosure of HIV diagnosis
Level 5 *Called upon by others to consult in cases of complex ethical dilemmas; identifies and seeks to address system-level factors that induce or exacerbate*	● Serves as the infectious disease representative for an ethics consultation
Assessment Models or Tools	● Direct observation ● Global evaluation ● Multisource feedback ● Self-reflection
Curriculum Mapping	●
Notes or Resources	● American Academy of Pediatrics. "Pediatric Collections." https://publications.aap.org/journals/pages/pediatric-collections. Accessed 2022. ● ABP. "Entrustable Professional Activities for Subspecialties: Infectious Diseases." 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. ● American Medical Association. "Pediatric Decision Making." https://www.ama-assn.org/delivering-care/ethics/pediatric-decision-making. Accessed 2022.

	● AMA Journal of Ethics. https://journalofethics.ama-assn.org/. Accessed 2022. ● 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. ● Chen, Candice, and Andrea Anderson. "How Should Health Professionalism Be Redefined to Address Health Equity?" *AMA Journal of Ethics* 23, no. 3 (March 1, 2021): 265–70. https://doi.org/10.1001/amajethics.2021.265. ● Cummings, Christy L., and Mark R. Mercurio. 2010. "Ethics for the Pediatrician: Autonomy, Beneficence, and Rights." *Pediatrics in Review 31 (6): 252–255.* https://doi.org/10.1542/pir.31-6-252. ● 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. ● US FDA. "Pediatric Ethics." https://www.fda.gov/science-research/pediatrics/pediatric-ethics. Accessed 2022.

Professionalism 3: Accountability/Conscientiousness **Overall Intent:** To take responsibility for one's own actions and the impact on patients and other members of the health care team	
Milestones	**Examples**
Level 1 *Performs tasks and responsibilities, with prompting*	● Responds to reminders from program administrator to report clinical and educational work hours ● 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 *Performs tasks and responsibilities in a timely manner in routine situations*	● 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 *Performs tasks and responsibilities in a thorough and timely manner in complex or stressful situations*	● Identifies multiple competing demands when caring for patients, appropriately triages tasks, and appropriately seeks help from other team members
Level 4 *Coaches others to ensure tasks and responsibilities are completed in a thorough and timely manner in complex or stressful situations*	● Reminds junior fellows to report clinical and educational work hours, and gives tips on task prioritization ● Supervises residents, fellows and/or medical students on a busy consult service, delegating tasks appropriately, and ensures that all tasks are completed for safe and thorough patient care
Level 5 *Creates strategies to enhance others' ability to efficiently complete tasks and responsibilities*	● Meets with multidisciplinary team (e.g., nurses, social worker, case manager) to streamline outpatient follow-up
Assessment Models or Tools	● Compliance with deadlines and timelines ● Direct observation ● Multisource feedback ● Self-evaluations and reflective tools
Curriculum Mapping	●
Notes or Resources	● ABP. "Entrustable Professional Activities for Subspecialties: Infectious Diseases." 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 promote well-being	
Milestones	**Examples**
Level 1 *Recognizes the importance of addressing personal and professional well-being*	● Acknowledges how individual response to participating in the care of a dying patient impacts well-being and performance ● Discusses the importance of a faculty mentor ● Recognizes that personal stress may require a change in schedule
Level 2 *Describes institutional resources that are meant to promote well-being*	● Identifies well-being resources such as meditation apps and mental health resources, available through the program and institution ● Meets with program director to discuss Family Medical Leave Act options when expecting a child ● Recognizes resources from employee assistance program (EAP) for well-being
Level 3 *Recognizes institutional and personal factors that impact well-being*	● Uses dictation app to improve efficiency in completing EHR documentation ● Identifies own personal stressors and how that may impact performance at work
Level 4 *Describes interactions between institutional and personal factors that impact well-being*	● Discusses a plan with mentor 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 and knows systems for reporting discrimination ● Understands the need to adjust rounding schedule to fit the needs of staff member and fellow workflow
Level 5 *Coaches and supports colleagues to optimize well-being at the team, program, or institutional level*	● Leads organizational efforts to promote clinician well-being ● Develops an affinity group to provide support for self and others to explore impact of microaggressions and biases ● Works with institutional leaders to address impact of middle-of-the-night community calls on well-being
Assessment Models or Tools	● Direct observation ● Group team activities ● Individual interview ● Institutional online training modules ● Self-assessment and personal learning plan
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: Infectious Diseases.” https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. ● Hicks, Patricia J., Daniel Schumacher, Susan Guralnick, Carol Carraccio, and Ann E. Burke. 2014. “Domain of Competence: Personal and Professional Development.” *Academic Pediatrics* 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 families, tailor communication to the needs of patients and their families, and effectively navigate difficult/sensitive conversations	
Milestones	**Examples**
Level 1 *Demonstrates respect and attempts to establish rapport* *Attempts to adjust communication strategies based upon patient/family expectations*	● Introduces self and faculty member, identifies patient and others in the room, and engages all parties in health care discussion ● Identifies need to ask parents to leave the room to complete exposure history in adolescent patients ● Identifies need for trained interpreter for patients with limited English proficiency
Level 2 *Establishes a therapeutic relationship in straightforward encounters* *Adjusts communication strategies as needed to mitigate barriers and meet patient/family expectations*	● Prioritizes and sets an agenda based on concerns of parents at the beginning of a visit with a child with an uncomplicated acute infection ● Uses nonjudgmental language to discuss sensitive topics ● Uses patient's preferred pronouns when addressing patient ● Offers HIV PrEP in LGBTQIA+ youth at high risk for HIV acquisition ● Identifies a family with low medical literacy and adjusts the conversation to facilitate understanding
Level 3 *Establishes a culturally competent and therapeutic relationship in most encounters* *Communicates with sensitivity and compassion, elicits patient/family values, and acknowledges uncertainty and conflict*	● Prioritizes and sets an agenda based on concerns of parents at the beginning of the visit with a child with multiple or complex infections ● Discusses sensitive topics while promoting trust, respect, and cultural sensitivity ● 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 ● Discusses the importance of partner notification following diagnosis of an STI while maintaining confidentiality to the extent possible
Level 4 *Establishes a therapeutic relationship in straightforward and complex encounters, including those with ambiguity and/or conflict* *Uses shared decision making with patient/family to make a personalized care plan*	● Continues to engage parents who refuse immunizations, addressing misinformation and reviewing risks/benefits to assuage these concerns in a manner that engages rather than alienates the patient's family ● Facilitates sensitive discussions with patient/family and interdisciplinary team ● While maintaining trust, engages family of a child with medical complexity along with other members of the multi-specialty care team in determining family wishes and expectations regarding anti-infective therapy at the end of life

Level 5 *Mentors others to develop positive therapeutic relationships* *Models and coaches others in patient- and family-centered communication*	● Acts as a mentor for junior learners disclosing difficult news to a patient and the patient's family ● Models and coaches the spectrum of difficult communication ● Develops a curriculum on patient- and family-centered communication, including navigating difficult conversations
Assessment Models or Tools	● Direct observation ● Kalamazoo Essential Elements Communication Checklist ● Skills needed to Set the state, Elicit information, Give information, Understand the patient, and End the encounter (SEGUE) ● Standardized patients ● Faculty member evaluation of the learner
Curriculum Mapping	●
Notes or Resources	● ABP. "Entrustable Professional Activities for Subspecialties: Infectious Diseases." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. ● Benson, Bradley J. 2014. "Domain of Competence: Interpersonal and Communication Skills." *Academic Pediatrics* 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." *Medical Teacher*. 33(1): 6-8. https://doi.org/10.3109/0142159X.2011.531170. ● Makoul, Gregory. 2001. "Essential Elements of Communication in Medical Encounters: the Kalamazoo Consensus Statement." *Academic Medicine*. 76(4): 390-393. https://journals.lww.com/academicmedicine/Fulltext/2001/04000/Essential_Elements_of_Communication_in_Medical.21.aspx#pdf-link. ● Makoul, Gregory. 2001. "The SEGUE Framework for Teaching and Assessing Communication Skills." *Patient Education and Counseling*. 45(1): 23-34. https://doi.org/10.1016/S0738-3991(01)00136-7. ● MedEdPORTAL. "Anti-Racism in Medicine Collection." https://www.mededportal.org/anti-racism. Accessed 2020. ● National LGBTQIA+ Health and Education Center. https://www.lgbtqiahealtheducation.org/. Accessed 2022. ● 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." *BMC Medical Education* 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 *Respectfully requests a consultation, with guidance* *Identifies the members of the interprofessional team*	● Consults on a patient with an eight-week history of fever, faint rash, and arthritis and suggests a rheumatology consult ● Recognizes the important roles of nursing, the primary care team, and other consultants
Level 2 *Clearly and concisely requests consultation by communicating patient information* *Participates within the interprofessional team*	● Offers to help the primary team in discussing an undrained brain abscess with neurological surgery ● Participates as a member of the infectious disease team at a multidisciplinary care conference for a patient
Level 3 *Formulates a specific question for consultation and tailors communication strategy* *Uses bi-directional communication within the interprofessional team*	● After a consultation has been completed, communicates with the primary care team to verify they have received and understand the recommendations ● Clarifies the priority of specimen testing for an interventional procedure requested by the infectious disease team
Level 4 *Coordinates consultant recommendations to optimize patient care* *Facilitates interprofessional team communication*	● Initiates a multidisciplinary meeting to develop an outpatient plan for a patient with complex medical needs and poor access to medical care who has a serious infection that will require prolonged IV antibiotics ● Coordinates with the lab to obtain additional susceptibilities for an organism
Level 5 *Maintains a collaborative relationship with referring providers that maximizes adherence to practice recommendations* *Coaches others in effective communication within the interprofessional team*	● Advises the primary team on navigating conflicting recommendations from various consultants ● Participates in the development of a multidisciplinary clinic or case conferences ● Models management of a miscommunication between different members of the health care team and the patient's family
Assessment Models or Tools	● Direct observation ● Global assessment ● Medical record (chart) review

	● Multi-source feedback
Curriculum Mapping	●
Notes or Resources	● ABP. "Entrustable Professional Activities for Subspecialties: Infectious Diseases." 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." *MedEdPORTAL*. 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." *MedEdPORTAL*. https://doi.org/10.15766/mep_2374-8265.622. ● François, José. 2011. "Tool to Assess the Quality of Consultation and Referral Request Letters in Family Medicine." *Canadian Family Physician.* 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." *BMJ*. 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." *Medical Teacher*. 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. ● Roth, Christine G., Karen W. Eldin, Vijayalakshmi Padmanabhan, and Ellen M. Freidman. 2018. "Twelve Tips for the Introduction of Emotional Intelligence in Medical Education." *Medical Teacher* 41(7): 1-4. https://doi.org/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 *Records accurate information in the patient record* *Identifies the importance of and responds to multiple forms of communication (e.g., in-person, electronic health record (EHR), telephone, email)*	● Corrects progress note after attending identifies outdated plan ● If using copy/paste/forward in the EHR, goes back to make changes to note after doing so ● Responds promptly to messages in EHR, secure text messaging, and pages
Level 2 *Records accurate and timely information in the patient record* *Selects appropriate method of communication, with prompting*	● Provides organized and accurate documentation that supports the treatment plan and limits extraneous information ● Appropriately documents sensitive information in a secure note, not accessible to parents of a minor/adolescent patient ● For an urgent matter, pages the primary team to communicate recommendations after prompting from supervising physician
Level 3 *Concisely documents updated, prioritized, diagnostic and therapeutic reasoning in the patient record* *Aligns type of communication with message to be delivered (e.g., direct and indirect) based on urgency and complexity*	● Produces documentation that reflects complex clinical thinking and planning and is concise, but may not contain contingency planning (i.e., if/then statements) ● In a patient with a prolonged hospital stay, appropriately revises notes to reflect the current infectious disease problems and not include past, resolved issues ● Responds promptly to an urgent page from the emergency department for a patient with possible toxic shock ● Emails patient's cardiologist with non-urgent question rather than paging cardiologist on call
Level 4 *Documents diagnostic and therapeutic reasoning, including anticipatory guidance* *Demonstrates exemplary written and verbal communication*	● Produces documentation that is consistently accurate, timely, organized, and concise; reflects complex clinical reasoning and frequently incorporates contingency planning ● Communicates effectively and proactively with collaborating physicians and teams about communication gaps in order to prevent recurrence
Level 5 *Models and coaches others in documenting diagnostic and therapeutic reasoning*	● Leads teams by modeling a range of effective tools and methods of communication that fit the context of a broad variety of clinical encounters ● Provides appropriate feedback to other learners regarding clinical reasoning and notes

Coaches others in written and verbal communication	● Designs and facilitates the improvement of systems that integrates effective communication among teams, departments, and institutions ● Models cultural sensitivity and humility in encounters with patients of different cultural backgrounds
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● ABP. "Entrustable Professional Activities for Subspecialties: Infectious Diseases." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. ● 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." *Teaching and Learning in Medicine.* 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." *Joint Commission Journal on Quality and Patient Safety.* 32(3):167-75. https://doi.org/10.1016/s1553-7250(06)32022-3. ● 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." *Pediatrics* 129.2:201-204. https://doi.org/10.1542/peds.2011-2966.

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: Diagnostic Reasoning MK2: Diagnostic Evaluation and Stewardship MK3: Treatments Including Source Control, Anti-Infectives, Immunoprophylaxis, and Adjunctive Therapies
PC3: Develop and carry out management plans	PC4: Consultative Care PC5: Management of Patients with Possible and Proven Infectious Diseases ICS1: Patient- and Family-Centered Communication
PC4: Provide appropriate role modeling	PBLI2: Reflective Practice and Commitment to Personal Growth
	PC2: Organization and Prioritization of Patient Care
MK1: Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems	MK1: Pathophysiology and Foundational Science MK4: Infection Control/Prevention and Epidemiology PBLI1: Evidence Based and Informed Practice
	MK6: Antimicrobial Stewardship
SBP1: Work effectively in various health care delivery settings and systems relevant to their clinical specialty	SBP3: System Navigation for Patient Cantered 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	MK5: Public Health 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
PBLI1: Identifying strengths, deficiencies, and limits to one's knowledge and expertise	PBLI1: Evidence Based and Informed Practice PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI2: Systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement	SBP2: Quality Improvement PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI3: Use information technology to optimize learning and care delivery	PBLI1: Evidence Based and Informed Practice PBLI2: Reflective Practice and Commitment to Personal Growth ICS3: Communication within Health Care Systems
PBLI4: Participate in the education of patients, families, students, residents, fellows, and other health professionals	SBP5: Population and Community Health PBLI1: 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	PBLI1: 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 PBLI1: 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 PBLI2: Reflective Practice and Commitment to Personal Growth PROF3: Accountability/Conscientiousness

ICS3: Act in a consultative role to other physicians and health professionals	PC4: Consultative Care ICS2: Interprofessional and Team Communication ICS3: Communication within Health Care Systems

Available Milestones Resources

Clinical Competency Committee Guidebook, updated 2020 - https://www.acgme.org/Portals/0/ACGMEClinicalCompetencyCommitteeGuidebook.pdf?ver=2020-04-16-121941-380

Clinical Competency Committee Guidebook Executive Summaries, new 2020 - https://www.acgme.org/What-We-Do/Accreditation/Milestones/Resources - Guidebooks - Clinical Competency Committee Guidebook Executive Summaries

Milestones Guidebook, updated 2020 - https://www.acgme.org/Portals/0/MilestonesGuidebook.pdf?ver=2020-06-11-100958-330

Milestones Guidebook for Residents and Fellows, updated 2020 - https://www.acgme.org/Portals/0/PDFs/Milestones/MilestonesGuidebookforResidentsFellows.pdf?ver=2020-05-08-150234-750

Milestones for Residents and Fellows PowerPoint, new 2020 -https://www.acgme.org/Residents-and-Fellows/The-ACGME-for-Residents-and-Fellows

Milestones for Residents and Fellows Flyer, new 2020 https://www.acgme.org/Portals/0/PDFs/Milestones/ResidentFlyer.pdf

Implementation Guidebook, new 2020 - https://www.acgme.org/Portals/0/Milestones%20Implementation%202020.pdf?ver=2020-05-20-152402-013

Assessment Guidebook, new 2020 - https://www.acgme.org/Portals/0/PDFs/Milestones/Guidebooks/AssessmentGuidebook.pdf?ver=2020-11-18-155141-527

Milestones National Report, updated each fall - https://www.acgme.org/Portals/0/PDFs/Milestones/2019MilestonesNationalReportFinal.pdf?ver=2019-09-30-110837-587 (2019)

Milestones Bibliography, updated twice each year - https://www.acgme.org/Portals/0/PDFs/Milestones/MilestonesBibliography.pdf?ver=2020-08-19-153536-447

Developing Faculty Competencies in Assessment courses - https://www.acgme.org/Meetings-and-Educational-Activities/Other-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://dl.acgme.org/pages/assessment

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