Supplemental Guide: Medical Toxicology

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Medical Toxicology 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 on the Resources page of the Milestones section of the ACGME website.

Patient Care 1: Clinical Reasoning: Differential Diagnosis **Overall Intent:** To formulate and iteratively evaluate a list of potential toxicologic exposures responsible for a patient's clinical findings	
Milestones	**Examples**
Level 1 *Identifies a patient's problem with a potential toxicologic cause*	● Identifies a toxidrome in a patient with unknown poisoning
Level 2 *Synthesizes all available data, including interview, physical examination findings, and preliminary laboratory data, to define the differential diagnosis*	● Creates a toxicologic differential diagnosis for acute liver injury ● Prioritizes differential diagnosis based on history and physical exam
Level 3 *Modifies and refines evidence-based differential diagnosis based upon clinical course and data, and avoids premature closure*	● Recognizes progression of toxidrome on examination and adjusts treatment plan appropriately, such as progression of serotonin syndrome ● Recognizes mimics of a toxidrome, such as encephalitis vs anticholinergic syndrome ● Considers rhabdomyolysis for an increased aspartate aminotransferase (AST) in addition to acetaminophen poisoning
Level 4 *Recognizes toxicological presentations and/or conflicting diagnostic results that deviate from common patterns and require more complex decision-making*	● Broadens sample testing to include more esoteric testing such as, heavy metal testing in altered mental status ● Considers ethylene glycol poisoning when a patient presents with elevated lactate levels
Level 5 *Develops guidelines or algorithms/protocols used for education and guidance for learners, clinicians, or poison specialists*	● Develops/updates diagnostic algorithm of acute toxic alcohol poisoning
Assessment Models or Tools	● Case Simulation ● Chart Audit ● Direct supervision ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Nelson LS, Howland MA, Lewin NA, et al. Initial evaluation of the patient: Vital signs and toxic syndromes. In: Nelson LS, Hoffman R, Howland MA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 28-31. ISBN:978-1259859618.

Patient Care 2: Ordering and Interpretation of Studies **Overall Intent:** To understand the types of testing that assist in diagnostic and treatment decisions and apply the test results	
Milestones	**Examples**
Level 1 *Orders diagnostic testing based on patient presentation*	● Recognizes when to order testing for common co-ingestants (aspirin/acetominophen) in a patient who has overdosed
Level 2 *Interprets diagnostic testing in the evaluation of toxicologic disease*	● Appropriately applies the Rumack-Matthews Nomogram in acetaminophen ingestion case ● Appropriately interprets the electrocardiogram (EKG) in a patient who overdosed and identifies sodium channel blockade
Level 3 *Orders advanced and ancillary diagnostic testing based on the pre-test probability of disease and the likelihood of test results altering management*	● Orders a heavy metal screening in a symptomatic patient ● Orders osmol gap and other ancillary testing to prioritize the differential diagnosis
Level 4 *Interprets advanced, ancillary, and forensic diagnostic testing*	● Interprets postmortem toxicology testing ● Interprets metal testing in the context of patient presentation
Level 5 *Develops order sets for the work up of the toxicologic patient*	● Develops protocols and order sets to enhance diagnostics and treatment of the patient with unknown poisoning
Assessment Models or Tools	● Case simulation ● Chart audit ● Direct supervision ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Grunbaum AM, Rainey PM. Laboratory principles. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 101-113. ISBN:978-1259859618. ● Jarvis M, Williams J, Hurford M, et al. Appropriate use of drug testing in clinical addiction medicine. *J Addict Med*. 2017;11(3):163-173. https://journals.lww.com/journaladdictionmedicine/Fulltext/2017/06000/Appropriate_Use_of_Drug_Testing_in_Clinical.1.aspx. ● Rao RB, Flomenbaum MA. Postmortem toxicology In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies.* 11th ed. New York, NY: McGraw Hill; 2019: 1884-1891. ISBN:978-1259859618.

Patient Care 3: Management Plan and Treatment **Overall Intent:** To develop and apply treatment plans for patients with diverse toxicologic disorders	
Milestones	**Examples**
Level 1 *Formulates initial treatment plans for straightforward toxicologic conditions*	● Formulates an initial treatment plan for a patient with a reported single, acute acetaminophen ingestion
Level 2 *Formulates comprehensive treatment plans for straightforward toxicologic conditions*	● Formulates and oversees treatment course for a person with a massive, single acute acetaminophen ingestion
Level 3 *Formulates comprehensive treatment plans for complex toxicological conditions*	● Formulates a treatment plan for a patient with a patient with hepatotoxicity following an acetaminophen ingestion/repeat supratherapeutic ingestion ● Incorporate extracorporeal management plans
Level 4 *Implements interdisciplinary team for complex toxicological conditions*	● Guides the primary service/leads the management team treating a critically ill patient with an acetaminophen ingestion and recommends when the patient should be referred for a liver transplant evaluation
Level 5 *Develops novel management strategies for poisonings*	● Develops a protocol using adjuvant treatment methods for acetaminophen ingestion
Assessment Models or Tools	● Case simulation ● Chart audit ● Direct supervision ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Nelson LS, Howland MA, Lewin NA, et al. Principles of managing the acutely poisoned or overdosed patient. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 33-41. ISBN:978-1259859618.

Patient Care 4: Substance Use and Withdrawal **Overall Intent:** To implement and maintain both pharmacologic and non-pharmacologic treatment modalities for patients with various substance use disorders and withdrawal syndromes	
Milestones	**Examples**
Level 1 *Recognizes withdrawal syndromes and substance use disorders*	● Describes the clinical findings in patients with opioid and alcohol withdrawal ● Lists the findings in Opioid Use Disorder (OUD), alcohol use disorder
Level 2 *Formulates treatment plan for patients with straightforward substance use disorders and withdrawal syndromes*	● Describes initiation process for buprenorphine and naltrexone for OUD ● Delineates symptom-triggered therapy for sedative hypnotic withdrawal syndrome ● Develops a treatment plan for smoking cessation
Level 3 *Initiates treatment of patients with complex substance use disorders and withdrawal syndromes*	● Manages precipitated withdrawal ● Starts buprenorphine induction in patients with concomitant ethanol withdrawal ● Provides management of ethanol withdrawal in patients with pulmonary disease
Level 4 *Selects therapies based on prior treatment response, co-morbidities, resources, and patient preferences*	● Discusses with patient the benefit and risk of pharmacotherapeutic options for OUD and alcohol use disorder ● Selects and adjusts dose and treatment approach based on response to treatment for OUD or alcohol use disorder
Level 5 *Establishes holistic treatment pathways involving institutional and community resources*	● Optimizes patient centered care by using counseling, encompassing more than pharmacologic treatment ● Organizes a peer navigator program or warm handoff process to outpatient care
Assessment Models or Tools	● Case simulation ● Chart audit ● Direct supervision ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Connors NJ, Hamilton RJ. Withdrawal principles. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 236-241. ISBN:978-1259859618. ● Gold J, Nelson LS. AIcohol withdrawal. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 1165-1171. ISBN:978-1259859618. ● Hawk K, Hoppe J, Ketcham E, et al. Consensus recommendations on the treatment of opioid use disorder in the emergency department. *Ann Emerg Med*. 2021;78(3):434-442. https://www.annemergmed.com/article/S0196-0644(21)00306-1/fulltext.

Medical Knowledge 1: Pathophysiology of Poisoning **Overall Intent:** To understand and explain how xenobiotics interfere with human functioning at a cellular and organ-based level	
Milestones	**Examples**
Level 1 *Discusses basic concepts of biochemistry, physiology, and pharmacology*	● Explains half-life, receptor efficacy (agonist versus antagonist), and volume of distribution ● Discriminates between sympathetic and parasympathetic effects
Level 2 *Describes basic toxicologic mechanisms and pathophysiology*	● Describes how cocaine causes cardiac toxicity ● Discusses how xenobiotics uncouple and inhibit oxidative phosphorylation ● Explains how xenobiotics cause elevated anion gap acidosis
Level 3 *Explains advanced toxicologic mechanisms and pathophysiology*	● Describes mechanisms of thalidomide teratogenicity ● Explains mechanisms of hepatotoxicity from amatoxin, acetaminophen, and valproic acid ● Describes the mechanism of carbon monoxide delayed neurologic sequalae ● Discusses the management of caustic ingestion in patients who have esophageal injury
Level 4 *Demonstrates sufficient knowledge about the pathophysiology of complex or rare toxicological conditions*	● Explains the complications in patients who are intestinal transporters of cocaine and heroin ● Explains the pathophysiology and risk factors of pneumoconiosis ● Describes the mechanisms of toxicant induced carcinogenicity ● Describes the toxicities that may occur from exposures to mycotoxins
Level 5 *Demonstrates expertise in toxicologic pathophysiology and epidemiologic associations*	● Serves on a US Food and Drug Administration (FDA) panel ● Develop a curriculum on toxicologic mechanisms of action for medical/pharmacy students
Assessment Models or Tools	● Case simulation ● Direct supervision ● Medical record (chart) audit ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Curry S, O'Connor AD, Graeme KA, Kang AM. Neurotransmitters and neuromodulators. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 203-235. ISBN:978-1259859618. ● Klaassen CD. *Casarett and Doull's Toxicology: The Basic Science of Poisons*. 9th ed. New York, NY: McGraw Hill; 2019. ISBN:978-1259863745.

Medical Knowledge 2: Population Exposure **Overall Intent:** To describe how xenbiotic exposures adversely affect populations and means of monitoring and mitigating those risks	
Milestones	**Examples**
Level 1 *Identifies major routes of human population exposure*	● Lists potential sources for exposure in a population who live near a chemical plant ● Lists routes through which xenobiotics can enter the body
Level 2 *Identifies sources of environmental exposures to chemical, physical, and biological hazards for defined populations*	● Describes sources of environmental radiation exposures ● Takes an environmental exposure history in a sample of a population to identify the source
Level 3 *Describes individual factors that impact susceptibility to adverse health effects from environmental exposures*	● Describes the physiologic reasons for increased susceptibility of an environmental xenobiotics induced disease in the pediatric, geriatric, and pregnant populations ● Identifies socioeconomic factors that impact the health outcomes from environmental exposures
Level 4 *Recommends methods of monitoring and reducing adverse environmental health effects for population*	● Describes the role of air monitoring, blood xenobiotic concentration testing, water testing for general population health ● Creates a medical surveillance program for preventative and exposure monitoring in a workplace setting
Level 5 *Uses data to characterize effects of exposure of a local population based on comparison with other populations*	● Develops protocols to limit the exposure of populations to chemical, physical, and biological hazards
Assessment Models or Tools	● Direct observation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Agency for Toxic Substances and Disease Registry (ATSDR). https://www.atsdr.cdc.gov/. Accessed 2021. ● McKay C. Risk assessment and risk communication In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 1814-1819. ISBN:978-1259859618. ● Oak Ridge Institute for Science and Education. Radiation Emergency Assistance Center/Training Site (REAC/TS). https://orise.orau.gov/reacts/index.html. Accessed 2021. ● Pediatric Environmental Health Specialty Unites (PEHSU). https://www.pehsu.net/. Accessed 2021. ● Toxic substance surveillance programs by state

Medical Knowledge 3: Laboratory and Clinical Testing **Overall Intent:** To understand the principles underlying the various types of analytic testing performed to assess xenobiotic exposure and clinical effect	
Milestones	**Examples**
Level 1 *Selects ancillary testing needed to assess an acute exposure*	● Demonstrates knowledge of laboratory principles using common ancillary testing such as fingerstick glucose, EKG, radiographs, and pulse oximetry
Level 2 *Interprets the results of ancillary testing for an exposure incorporating the pharmacokinetics of the xenobiotic*	● Demonstrates knowledge of commonly performed toxicology testing, including limitations and methodology ● Identifies the differences between assay methods (e.g., screening, confirmatory) ● Interprets results of therapeutic drug monitoring ● Uses the Rumack-Matthew Nomogram to appropriately interpret an acetaminophen concentration
Level 3 *Compares the analytical modalities, including appropriateness, limitations, and methodology*	● Identifies types of interference and causes of false negative and false positive results ● Compares the utility of different analytical techniques (e.g., gas chromatography mass spectrometry, thin layer chromatography, immunoassay testing) for detection of a xenobiotic
Level 4 *Demonstrates knowledge of advanced analytical and clinical testing including alternative matrices*	● Interprets advanced testing for xenobiotic induced organ injury such as pulmonary function test, nerve conduction studies, forensic and post-mortem testing ● Identifies biomarkers of exposure or effect ● Compares the advantages and disadvantages of alternative testing samples such as hair, saliva, and meconium ● Describes medicolegal issues involving workplace testing, performance enhancing drugs, and forensic testing
Level 5 *Develops protocols for advanced and alternative clinical testing*	● Independently serves as a medical review officer ● Participates as an expert in a medicolegal event
Assessment Models or Tools	● Direct observation ● Global assessment
Curriculum Mapping	●
Notes or Resources	● Ideally fellows would have direct experience with an analytical toxicology laboratory ● Baselt R. *Disposition of Toxic Drugs and Chemicals in Man*. 12th ed. Seal Beach, CA: Biomedical Publications; 2020. ISBN:978-0-578-57749-4. ● Grunbaum AM, Rainey PM. Laboratory principles. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 101-113. ISBN:978-1259859618. ● Rao RB, Flomenbaum MA. Postmortem toxicology In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies.* 11th ed. New York, NY: McGraw Hill; 2019: 1884-1891. ISBN:978-1259859618.

Medical Knowledge 4: Substance Use and Withdrawal **Overall Intent:** To understand and describe the neurobiology and pathophysiology of substance use disorder and withdrawal syndromes and the pharmacologic basis of treatment	
Milestones	**Examples**
Level 1 *Discusses the relevant terminology of substance use, addiction, and withdrawal*	● Explains the importance of non-stigmatizing language when discussing substance use disorder ● Describes dependence, addiction, and use disorder ● Distinguishes the various common withdrawal syndromes
Level 2 *Describes the biological basis, pharmacokinetics, and toxicokinetics of psychoactive and addictive substances*	● Describes pharmacokinetics/ pharmacodynamics of tolerance ● Describes pharmacokinetics and pharmacodynamics of dependence and withdrawal ● Explains the basic role of risk-reward in addiction ● Describes the role of the limbic system in euphoria
Level 3 *Explains the basis of treatments, pharmacological and nonpharmacological, for patients with SUD and withdrawal*	● Describes the mechanism of action of naloxone and naltrexone for OUD ● Describes the mechanism of action of naltrexone and acamprosate for alcohol use disorder ● Explains the mechanism of benzodiazepines and buprenorphine for withdrawal ● Explains the role of motivational interviewing and counseling in recovery
Level 4 *Identifies the systems-related issues that interfere with e identification, analysis, and treatment of substance use and withdrawal LN*	● Explains the role of urine drug screening, including buprenorphine metabolites in assessing compliance with therapy ● Explains the bio/psycho/social dynamics associates with outpatient treatment failure
Level 5 *Develops curriculum for the management of withdrawal*	● Creates buprenorphine guideline for emergency physicians ● Creates guideline for treating ethanol withdrawal ● Establishes guidelines for poison center specialists to manage precipitated withdrawal
Assessment Models or Tools	● Case simulation ● Direct observation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Connors NJ, Hamilton RJ. Withdrawal principles. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 236-241. ISBN:978-1259859618. ● Gold J, Nelson LS. Alcohol withdrawal. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 1165-1171. ISBN:978-1259859618.

Medical Knowledge 5: Occupational Medicine/Occupational Toxicology **Overall Intent:** To describe the xenobiotic-related risks associated with various occupations and means to mitigate those risks	
Milestones	**Examples**
Level 1 *Recognizes occupational hazards*	● Identifies benzene as an occupational hazard ● Describes routes of exposure in occupational settings
Level 2 *Identifies relevant agencies and their role in risk assessment, mitigation, and education*	● Identifies and describes the roles of Occupational Safety and Health (OSHA), National Institute for Occupational Safety and Health (NIOSH), US Environmental Protection Agency (EPA), Agency for Toxic Substances and Disease Registry (ATSDR)
Level 3 *Explains the core principles of occupational safety, risk assessment and communication, and the hierarchy of hazard controls*	● Explains engineering controls and, personal protective equipment ● Identifies the principles of risk assessment in the occupational setting
Level 4 *Discusses the principles of occupational safety, risk assessment, and hazard control with patients or population groups*	● Provides guidance to firefighters with suspected carbon monoxide or cyanide exposure ● Communicates risk of lead exposure to workers at a firearm shooting range
Level 5 *Applies core principles of risk assessment and hierarchy of controls to reduce risks from safety hazards to patients or population groups*	● Creates an algorithm to guide reduction of carbon monoxide or cyanide exposure forthe fire department or emergency medical services (EMS)
Assessment Models or Tools	● Case simulation ● Direct observation ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● ATSDR. Toxicologic Profiles. https://www.atsdr.cdc.gov/toxprofiledocs/index.html. Accessed 2021. ● Wald P. Principles of occupational toxicology: Diagnosis and control. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 1797-1805. ISBN:978-1259859618.

Systems-Based Practice 1: Patient Safety **Overall Intent:** To engage in the analysis and management of patient safety events, including relevant communication with 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 patient misidentification or medication errors as common patient safety events ● Describes how to report errors at own institution
Level 2 *Identifies system factors that lead to patient safety events* *Reports patient safety events through institutional reporting systems (simulated or actual)*	● Identifies look-alike/sound-alike medications that could cause medication errors ● Reports a near miss or medication error through the institutional reporting system
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)*	● Preparing for morbidity and mortality presentations ● Participates in an exercise to communicate with patients/families about a medication administration error
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)*	● Collaborates with a team to conduct the analysis of a medication administration errors and can effectively communicate with patients/families about those events
Level 5 *Actively engages teams and processes to modify systems for preventing patient safety events* *Acts as a role model and/or mentor for others in the disclosing of patient safety events*	● Participates in an institution-wide safety committee ● Develops and conducts a simulation for disclosing patient safety events
Assessment Models or Tools	● Direct observation ● E-module multiple choice tests ● Multisource feedback ● Portfolio

	● Reflection ● Simulation
Curriculum Mapping	●
Notes or Resources	● Institute of Healthcare Improvement. Open School. http://www.ihi.org/education/IHIOpenSchool/Pages/default.aspx. Accessed 2021. ● Langley GJ, Moen RD, Nolan Km, et al. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*. 2nd ed. San Francisco, CA: Jossey-Bass; 2009. ISBN:978-0470192412. ● Farmer B. Medication safety and adverse drug events. In: Nelson LS, Howland MA, Lewin NA, et al. *Goldfrank's Toxicologic Emergencies*. 11th ed. New York, NY: McGraw Hill; 2019: 1822-1831. ISBN:978-1259859618.

Systems-Based Practice 2: Quality Improvement **Overall Intent:** To conduct a quality improvement project	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of basic quality improvement methodologies and metrics*	● Describes quality assurance analysis tool
Level 2 *Describes local quality improvement initiatives (e.g., emergency department throughput, testing turnaround times)*	● Summarizes protocols resulting in decreased hypoglycemic incident events
Level 3 *Participates in local quality improvement initiatives*	● Participates in project identifying root cause analysis
Level 4 *Demonstrates the skills required for identifying, developing, implementing, and analyzing a quality improvement project*	● Participates in the completion of a quality improvement project to improve community naloxone distribution, including, for example, assessing the problem, articulating a broad goal, developing a SMART (Specific, Measurable, Attainable, Realistic, Time-bound) objective plan, and monitoring progress and challenges
Level 5 *Creates, implements, and assesses quality improvement initiatives at the institutional or community level*	● Initiates and completes a quality improvement project to improve community naloxone distribution
Assessment Models or Tools	● Direct observation ● E-module multiple choice tests ● Multisource feedback ● Reflection
Curriculum Mapping	●
Notes or Resources	● Institute of Healthcare Improvement. Open School. http://www.ihi.org/education/IHIOpenSchool/Pages/default.aspx. Accessed 2021. ● Langley GJ, Moen RD, Nolan Km, et al. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*. 2nd ed. San Francisco, CA: Jossey-Bass; 2009. ISBN:978-0470192412.

Systems-Based Practice 3: System Navigation for Patient-Centered Care **Overall Intent:** To effectively navigate the health care system, including the interdisciplinary team and other care providers, and to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of care coordination* *Identifies key elements for safe and effective transitions of care and hand-offs*	● Identifies methods to contact poison center ● Identifies hand-off tools during change in call
Level 2 *Coordinates care of patients in routine clinical situations effectively using the roles of the interprofessional teams* *Performs safe and effective transitions of care/hand-offs in routine clinical situations*	● For a patient with OUD, identifies need for referral process to medication-assisted treatment (MAT), outpatient therapy, and/or psychiatrist ● Facilitates the referral process for outpatient substance use and mental health therapy
Level 3 *Coordinates care of patients in complex clinical situations effectively using the roles of their interprofessional teams* *Performs safe and effective transitions of care/hand-offs in complex clinical situations*	● Coordinates care of a pediatric patient with psychiatric comorbidities and intentional exposure with the primary care provider, psychiatry, and social work ● Arranges for transfer or hospital admission for a patient that requires a higher level of care for a patient with critical illness after exposure ● Coordinates care with department of social services/child protection for positive toxicology screening for a child
Level 4 *Role models effective coordination of patient-centered care among different disciplines and specialties* *Role models and advocates for safe and effective transitions of care/hand-offs*	● Effectively role models care of patients who need dialysis post exposure ● Proactively communicates anticipatory guidance to other providers to ensure repeat labs and dialysis sessions for transitions of care
Level 5 *Analyzes the process of care coordination and leads in the design and implementation of improvements* *Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes*	● Develops a protocol to assess and initiate extracorporeal membrane oxygenation (ECMO) for refractory treatment of calcium channel blocker poisoning ● Works with department of health to ensure follow-up after community exposure
Assessment Models or Tools	● Direct observation

	● Medical record (chart) audit ● Multisource feedback ● Quality metrics and goals mined from electronic health record (EHR) ● Review of sign-out tools, use and review of checklists
Curriculum Mapping	●
Notes or Resources	● Kaplan KJ. TissuePathology. In pursuit of patient-centered care. March 2016. http://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns. Accessed 2021.

Systems-Based Practice 4: Population Health **Overall Intent:** To effectively navigate the health care system, including the interdisciplinary team and other care providers, to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of population and community health needs*	● Identifies that non-English-speaking patients may have different needs than English-speaking patients when taking a history ● Identifies that lack of health insurance may delay treatment for toxicologic/medical conditions ● Identifies need for translation services for non-English-speaking patients
Level 2 *Identifies specific population and community health need for their local population*	● Identifies individuals at high risk for exposure to environmental or occupational xenobiotics ● Recognizes that individuals in older homes and/or with lower socioeconomic status are at higher risk for environmental xenobiotics, such as lead
Level 3 *Uses local resources effectively to meet the needs of a patient population and community*	● Interfaces with health department/community resources to provide outpatient assistance (such as substance use disorder resources (SUD), home lead assessment, or carbon monoxide testing)
Level 4 *Participates in changing and adapting practice to provide for the needs of specific populations*	● Assists in designing patient educational materials for toxicologic conditions ● Assists with implementation of workplace safety protocols in the context of small business, rural work settings, and similar vulnerable work populations that may lack access to traditional occupational safety and health services ● Adjusts treatments based on health department resources, population shifts, and changes in medication/antidote availability
Level 5 *Leads innovations and advocates for populations and communities with specific health care needs*	● Leads development of telehealth services ● Leads efforts for community health screenings for consequential toxicological risks
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Multisource feedback ● Quality metrics and goals mined from EHR
Curriculum Mapping	●
Notes or Resources	● CDC. Population Health Training. https://www.cdc.gov/pophealthtraining/whatis.html. Accessed 2021. ● Kaplan KJ. Tissue Pathology. In pursuit of patient-centered care. March 2016. http://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns. Accessed 2021. ● Medscape. Setting up a telemedicine program in your practice. https://www.medscape.com/courses/section/921364. Accessed 2021.

	● Pediatric Environmental Health Specialty Units (PEHSU). National Classroom. https://www.pehsu.net/nationalclassroom.html. Accessed 2021. ● Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD. *AMA Education Consortium: Health Systems Science*. 1st ed. Philadelphia, PA: Elsevier; 2016. ISBN:978-0323461160.

Systems-Based Practice 5: Physician Role in Health Care Systems **Overall Intent:** To understand the physician's role in the complex health care system and how to optimize the system to improve patient care and the health system's performance	
Milestones	**Examples**
Level 1 *Identifies key components of the complex health care system (e.g., hospital, skilled nursing facility, finance, personnel, technology)*	● Describes the role of a consulting service versus the primary team
Describes basic health payment systems, including (e.g., government, private, public, uninsured care) practice models	● Understands the impact of health plan coverage on availability of prescription drugs ● Describes the differences between resources available at public versus private hospitals
Level 2 *Describes how components of a complex health care system are interrelated, and how this impacts patient care*	● Describes how differing hospital capabilities may change how exposure may be treated at different facilities
Delivers care with consideration of each patient's payment model (e.g., insurance type)	● Chooses SUD treatment recommendations based on insurance formulary and benefits ● Identifies the type of insurance a patient has For patients with workers compensation, considers required documentation and referral process
Level 3 *Discusses how individual practice affects the broader system (e.g., length of stay, readmission rates, clinical efficiency)*	● Describes how different assessment and treatment plans may affect length of stay and cost of care
Engages patients in shared decision making, informed by each patient's payment models	● Discusses the potential costs of different SUD treatment modalities in relation to insurance and ability to pay
Level 4 *Manages various components of the complex health care system to provide efficient and effective patient care and the transition of care*	● Effectively guides the primary team through a complex patient treatment plan ● Determines when patients may need to be moved to higher levels of care such as transfer to tertiary care facilities
Advocates for patient care needs with consideration of the limitations of each patient's payment model	● Engages with or arranges for insurance providers to authorize coverage for requested treatment ● Works collaboratively to improve patient assistance resources for a patient needing medication assisted therapy to prevent future overdoses
Level 5 *Advocates for or leads systems change that enhances high value, efficient, and effective patient care, and the transition of care*	● Works with local and state health departments to change policy

Participates in health policy advocacy activities	● Engages local and federal legislators to advocate for policy changes
Assessment Models or Tools	● Direct observation ● Patient satisfaction data ● Portfolio
Curriculum Mapping	●
Notes or Resources	● Agency for Healthcare Research and Quality (AHRQ). Major Physician Measurement Sets. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/measurementsets.html. Accessed 2021. ● AHRQ. Measuring the Quality of Physician Care. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/challenges.html. Accessed 2021. ● The Commonwealth Fund. Health System Data Center. http://datacenter.commonwealthfund.org/?_ga=2.110888517.1505146611.1495417431-1811932185.1495417431#ind=1/sc=1. Accessed 2021. ● Dzau VJ, McClellan MB, McGinnis JM, et al. Vital directions for health and health care: Priorities from a National Academy of Medicine initiative. *JAMA*. 2017;317(14):1461-1470. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. Accessed 2021. ● The Kaiser Family Foundation. www.kff.org. Accessed 2021. ● The Kaiser Family Foundation: Topic: Health Reform. https://www.kff.org/topic/health-reform/. Accessed 2021. ● Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD. *AMA Education Consortium: Health Systems Science*. 1st ed. Philadelphia, PA: Elsevier; 2016. ISBN:978-0323461160.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice **Overall Intent:** To incorporate evidence and patient values into clinical practice	
Milestones	**Examples**
Level 1 *Demonstrates how to access and use available evidence*	● Accesses and uses health information, including articles through the hospital library, using databases, such as PubMed and PoisIndex ● Identifies methodology of articles such as cross sectional, case control, or cohort study
Level 2 *Articulates the clinical questions that are necessary to guide evidence-based care*	● Formulates patient oriented clinical questions and may take the form of Patient-Intervention-Control-Outcome (PICO) ● Self-identifies areas of uncertainty and asks for help in answering clinical questions ● Identifies and recognizes measures for comparing risk such as-risk ratios, odds ratios ● Identifies and recognizes measures of disease frequency such as incidence, prevalence, mortality
Level 3 *Locates and applies the best available evidence, integrating it with patient preference, to the care of complex patients*	● Demonstrates a high level of mastery with electronic tools applied to clinical practice ● Appropriately uses clinical practice guidelines in making patient care decisions while eliciting patient preferences ● Identifies bias in a research article ● Describes methodological techniques that can be used to reduce confounders
Level 4 *Critically appraises and applies evidence even in the face of uncertainty and of conflicting evidence to guide care that is tailored to the individual patient*	● Demonstrates the ability to critically evaluate source data and merge the evidence with its application at the bedside ● Makes use of best evidence practices while also being able to define when and/or why to deviate from those standards ● Leads a journal club that compares and contrasts the available evidence ● Compares and contrasts evidence as it applies to an individual patient ● Develops EHR processes to improve quality of care such as through decision support or order sets
Level 5 *Coaches others to critically appraise and apply evidence for complex patients, and/or participates in the development of guidelines*	● Participates as a member (or even leader) of local teams that are tasked with developing best practices in the context of the local institution ● Sought after by more junior learners to teach them how to prepare for and present at journal club ● Leads clinical teaching on application of best practices in critical appraisal of poisoning management ● As part of a team, develops observation protocols and treatment pathways for exposures
Assessment Models or Tools	● Direct observation ● Journal club ● Oral or written examinations ● Presentation evaluation ● Research portfolio

Curriculum Mapping	●
Notes or Resources	● Guyatt G. U*sers' Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice.* 3rd ed. United States; McGraw-Hill; 2014. ISBN:978-0071790710. ● U.S. National Library of Medicine. PubMed Tutorial. https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html. Accessed 2021.

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth **Overall Intent:** To seek clinical performance information with the intent to improve care; reflects on all domains of practice, personal interactions, and behaviors, and their impact on colleagues and patients (reflective mindfulness); develop clear objectives and goals for improvement in some form of a learning plan	
Milestones	**Examples**
Level 1 *Demonstrates an openness to performance data (feedback and other input)*	● Asks for and accepts feedback from all members of the team
Level 2 *Demonstrates an openness to performance data and uses it to develop personal and professional goals* *Identifies the factors that contribute to the gap(s) between expectations and actual performance*	● After receiving feedback noting deficiencies, the fellow discusses possible reasons with mentor(s) and begins to implement suggested changes ● When discussing goals, identifies areas in need of improvement from prior feedback and sets appropriate learning goals ● Assesses time management skills and how it impacts timely completion of fellowship duties ● Demonstrates understanding of performance gaps when completing self-evaluation
Level 3 *Seeks and accepts performance data for developing personal and professional goals* *Analyzes and reflects upon the factors that contribute to gap(s) between expectations and actual performance*	● Using web-based resources, creates a personal curriculum to improve own evaluation of patients. ● Participates in quality assurance and process improvement activities related to own performance
Level 4 *Using performance data, continually improves and measures the effectiveness of one's personal and professional goals* *Analyzes, reflects on, and institutes behavioral change(s) to narrow the gap(s) between expectations and actual performance*	● Uses performance data, creates an improvement plan on teaching skills ● After patient encounter, debriefs with the attending and other patient care team members to optimize future collaboration with the consulting service ● Creates a form for written feedback from learners and modifies teaching style based on the feedback.
Level 5 *Acts as a role model for the development of personal and professional goals* *Coaches others on reflective practice*	● Mentors learners in practice improvement and adaptability ● Develops educational module for collaboration with other patient care team members ● Assists first-year fellows in developing their individualized learning plans
Assessment Models or Tools	● Direct observation ● Review of learning plan
Curriculum Mapping	●

Notes or Resources	● Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: Practice-based learning and improvement. Acad Pediatr. 2014;14(2 Suppl):S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/fulltext. ● Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. *Acad Med*. 2009;84(8):1066-74. https://insights.ovid.com/crossref?an=00001888-200908000-00021. ● Lockspeiser TM, Schmitter PA, Lane JL, Hanson JL, Rosenberg AA, Park YS. Assessing residents' written learning goals and goal writing skill: Validity evidence for the learning goal scoring rubric. Acad Med. 2013;88(10):1558-1563. https://insights.ovid.com/article/00001888-201310000-00039.

Professionalism 1: Professional Behavior and Ethical Principles **Overall Intent:** To recognize and address lapses in ethical and professional behavior, demonstrates ethical and professional behaviors, and use appropriate resources for managing ethical and professional dilemmas	
Milestones	**Examples**
Level 1 *Demonstrates professional behavior in routine situations and in how to report professionalism lapses*	● Recognizes when one's own fatigue may influence professionalism
Demonstrates knowledge of the ethical principles underlying patient care	● Articulates how the principle of "do no harm" applies to a patient who requests chelation that may not be indicated. ● Recognizes that ethical principles should dominate in discussing the risks and benefits of therapies that have not been studied
Level 2 *Identifies and describes potential triggers and takes responsibility for professionalism lapses*	● Identifies one's responses to inadequate information from consultants or poison center staff that contribute to one own's frustrations and their impact on the team dynamic
Analyzes straightforward situations using ethical principles	● Applies ethical principles to: informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics
Level 3 *Exhibits professional behavior in complex and/or stressful situations*	● Appropriately responds to a distraught family member following an unsuccessful resuscitation attempt of a relative ● After noticing a colleague's inappropriate social media post that included patient-related information, reports to appropriate supervisor ● Reviews policies related to posting of content and seeks guidance from fellowship program director
Analyzes complex situations using ethical principles, and recognizes the need to seek help in managing and resolving them	● Offers treatment options for a patient, free of bias, while recognizing own limitations and consistently honoring the patient's choice
Level 4 *Sets apart those situations that might trigger professionalism lapses and intervenes to prevent them in oneself and others*	● Actively considers the perspectives of others ● Promotes respect for all patients amongst your colleagues
Uses appropriate resources for managing and resolving ethical dilemmas	● Recognizes and uses ethics consults, literature, risk-management/legal counsel to resolve ethical dilemmas
Level 5 *Coaches others when their behavior fails to meet professional expectations*	● Discusses how a colleague's lateness to morning rounds effects the entire team with them and helps to develop strategies to prevent recurrence

Identifies and addresses system-level factors that either induce or exacerbate ethical problems or impede their resolution	● Engages stakeholders to address health inequities that result in increased exposures to xenobiotics
Assessment Models or Tools	● Direct observation ● Global evaluation ● Multisource feedback ● Oral or written self-reflection
Curriculum Mapping	●
Notes or Resources	● The American College of Emergency Physicians (ACEP). Code of Ethics for Emergency Physicians. https://www.acep.org/patient-care/policy-statements/code-of-ethics-for-emergency-physicians/. Accessed 2021. ● American Medical Association (AMA). Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. Accessed 2020. ● ABIM Foundation. American Board of Internal Medicine. Medical professionalism in the new millennium: A physician charter. *Annals of Internal Medicine*. 2002;136(3):243-246. https://annals.org/aim/fullarticle/474090/medical-professionalism-new-millennium-physician-charter. ● Bynny RL, Paauw DS, Papadakis MA, Pfeil S. *Medical Professionalism Best Practices: Professionalism in the Modern Era*. Aurora, CO: Alpha Omega Alpha Medical Society; 2017. *Medical Professionalism Best Practices: Professionalism in the Modern Era*. Aurora, CO: Alpha Omega Alpha Medical Society; 2017. http://alphaomegaalpha.org/pdfs/Monograph2018.pdf. ● Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. 1st ed. New York, NY: McGraw-Hill Education; 2014. ISBN:978-0071807432.

Professionalism 2: 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 *Takes responsibility for failure to complete tasks and responsibilities, identifies potential contributing factors, and describes strategies for ensuring timely task completion in the future*	● Apologizes for delay in consultation and describes how they will ensure better time management
Level 2 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations*	● Completes administrative tasks, documents completion of required training and patient safety modules by specified due date ● Anticipates potential barriers and deadlines and completes clinical and academic tasks in a timely manner
Level 3 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations*	● Notifies faculty member, attending, and/or program director/program coordinator of multiple competing demands and asks for assistance, as needed ● In preparation for absences from program site, completes tasks and coordinates coverage as necessary
Level 4 *Recognizes situations that may impact others' ability to complete tasks and responsibilities in a timely manner*	● Assesses programmatic gaps that affect learning and plans accordingly to recommend modifications (e.g., lack of timely completion of labs or studies) ● Takes responsibility for identifying required projects and planning for their completion
Level 5 *Proactively develops and implements strategies to ensure that the needs of patients, teams, and systems are met*	● Serves on state board committee for licensure that evaluates professionalism lapses in the physician work force
Assessment Models or Tools	● Compliance with deadlines and timelines ● Direct observation ● Global evaluations ● Multisource feedback ● Self-evaluations and reflective tools
Curriculum Mapping	●
Notes or Resources	● ACGME. Common Program Requirements https://www.acgme.org/What-We-Do/Accreditation/Common-Program-Requirements. Accessed 2021. ● American College of Occupational and Environmental Medicine (ACOEM). Code of Ethics. https://acoem.org/about-ACOEM/Governance/Code-of-Ethics. Accessed 2021. ● Institutional handbook of operating procedures

Professionalism 3: Self-Awareness and Well-Being **Overall Intent:** To identify, use, manage, improve, and seek help for personal and professional well-being for self and others	
Milestones	**Examples**
Level 1 *Recognizes, with assistance, the status of one's personal and professional well-being*	● Acknowledges own response to work-life balance ● Accesses self-assessment tools
Level 2 *Independently recognizes the status of one's personal and professional well-being and engages in help-seeking behaviors*	● Independently identifies and communicates impact of a personal family hardship ● Identifies support system when feeling overwhelmed or emotionally impacted by the loss of a patient
Level 3 *With assistance, proposes a plan to optimize personal and professional well-being*	● With the multidisciplinary team, develops a reflective response to deal with personal impact of difficult patient encounters and disclosures
Level 4 *Independently develops a plan to optimize one's personal and professional well-being*	● Independently identifies ways to manage personal stress ● Prioritizes activities to promote a healthy work/life balance
Level 5 *Coaches others when their emotional responses or level of knowledge/skills fail to meet professional expectations*	● Assists in organizational efforts to address clinician well-being after patient diagnosis/prognosis/death
Assessment Models or Tools	● Direct observation ● Group interview or discussions for team activities ● Individual interview ● Institutional online training modules or assessment tools ● Self-assessment and personal learning plan
Curriculum Mapping	●
Notes or Resources	● This subcompetency is not intended to evaluate a resident's well-being, but to ensure each resident 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. ● Local resources, including Employee Assistance Programs (EAPs) ● ACGME. Tools and Resources. https://dl.acgme.org/pages/well-being-tools-resources. Accessed 2021. ● Hicks PJ, Schumacher D, Guralnick S, Carraccio C, Burke AE. Domain of competence: personal and professional development. *Acad Pediatr*. 2014;14(2 Suppl):S80-97. https://www.academicpedsjnl.net/article/S1876-2859(13)00332-X/fulltext.

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication **Overall Intent:** To deliberately use language and behaviors to form constructive relationships with patients, to identify communication barriers including self-reflection on biases, and minimize them in the doctor-patient relationships; organize and lead communication around shared decision making	
Milestones	**Examples**
Level 1 *Uses language and non-verbal behavior to reflect respect and establish rapport while accurately communicating one's own role within the health care system*	● Appropriately introduces self and faculty member, identifies patient and others in the room, and engages all parties in health care discussion
Identifies common barriers to effective communication (e.g., language, disability)	● Identifies need for and uses a trained interpreter with non-English-speaking patients
With insight gained through an assessment of the patient's/patient's family's expectations coupled with an understanding of their health status and treatment options, adjusts one's communication strategies	● Identifies a patient's level of health literacy to ensure materials are provided at the patient's level
Level 2 *Establishes a therapeutic relationship in straightforward encounters with patients using active listening and clear language*	● Avoids medical jargon when discussing antidotes and potential adverse events pertaining to ingestions/overdoses
Identifies complex barriers to effective communication (e.g., health literacy, cultural differences, technology)	● Explains anticipated clinical course of acetaminophen ingestion and treatment
Organizes and initiates communication with a patient/patient's family by clarifying expectations and verifying one's understanding of the clinical situation	● Asks the patient to explain their understanding of the disease process after your explanation
Level 3 *Establishes a therapeutic relationship in challenging patient encounters*	● Acknowledges patient's request for testing not indicated based on history and physical examination (hair testing, heavy metal screening) and educates the patient about pitfalls of misinterpreting standalone laboratory testing
When prompted, reflects on biases, while attempting to minimize communication barriers	● Consults family to determine goals and a plan of care for a critically ill patient

With guidance, sensitively and compassionately delivers medical information to patients, elicits patient's/patient's family's values, learns their goals and preferences, and acknowledges uncertainty and conflict	
Level 4 *Easily establishes therapeutic relationships with patients, regardless of the complexity of cases* *Independently recognizes biases of patients, while attempting to proactively minimize communication barriers* *Independently uses shared decision making with a patient/patient's family to align their values, goals, and preferences with potential treatment options and ultimately to achieve a personalized care plan*	● Engages representative family members with disparate goals in the care of the patient with ingestion requiring follow up mental health services ● Uses patient and family input to engage mental health/social services and develop a holistic plan of care ● Participates in a discussion with team and family members around withdrawal of care, including discussions about brain death, transplant/donor candidate, etc.
Level 5 *Acts as a mentor to others in situational awareness and critical self-reflection with the aim of consistently developing positive therapeutic relationships and minimizing communication barriers* *Develops educational programs or services that address bias or communication strategies.* *Acts as a role model to exemplify shared decision making in communication with patients/patients' families that embodies various degrees of uncertainty/conflict*	● Guides peers through complex legal and ethical dilemmas, including contact with child services ● Participates in bioethics consult ● Serves on a hospital bioethics committee ● Takes a training course in bioethics
Assessment Models or Tools	● Direct observation ● Kalamazoo Essential Elements Communication Checklist (Adapted) ● Self-assessment including self-reflection exercises ● Skills needed to Set the state, Elicit information, Give information, Understand the patient, and End the encounter (SEGUE)
Curriculum Mapping	●

Notes or Resources	● Laidlaw A, Hart J. Communication skills: An essential component of medical curricula. Part I: Assessment of clinical communication: AMEE Guide No. 51. *Med Teach*. 2011;33(1):6-8. https://www.tandfonline.com/doi/abs/10.3109/0142159X.2011.531170?journalCode=imte20. ● Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. *Acad Med*. 2001;76(4):390-393. https://journals.lww.com/academicmedicine/Fulltext/2001/04000/Essential_Elements_of_Communication_in_Medical.21.aspx. ● Makoul G. The SEGUE Framework for teaching and assessing communication skills. *Patient Educ Couns*. 2001;45(1):23-34. https://www.sciencedirect.com/science/article/abs/pii/S0738399101001367?via%3Dihub. ● Symons AB, Swanson A, McGuigan D, Orrange S, Akl EA. A tool for self-assessment of communication skills and professionalism in residents. *BMC Med Educ*. 2009; 9:1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2631014/.

Interpersonal and Communication Skills 2: Interprofessional and Team Communication **Overall Intent:** To effectively communicate with the health care team, including consultants, in both straightforward and complex situations	
Milestones	**Examples**
Level 1 *Respectfully provides a consultation* *Receives feedback in a thoughtful and respectful manner*	● When speaking as a consultant, introduces self and is readily available and pleasant ● Acknowledges areas for improvement communicated to them by members of the health care team
Level 2 *Clearly and concisely engages consultants or other resources for patient care* *Solicits feedback on performance as a member of the health care team*	● Communicates patient information to the patient care team and clearly states what is being requested from the service at the end of the consultation (e.g., dialysis, ECMO, surgical exploration) ● Asks for feedback from the supervising physicians or nursing staff members regarding performance after a patient care encounter
Level 3 *Integrates recommendations made by various members of the health care team to optimize patient care* *Communicates concerns and provides feedback to peers and learners*	● Collaborates with the patient care team to evaluate, integrate, and prioritize other consultant recommendations in the patient's treatment plan ● Suggests areas for improvement to team members and includes multiple resources for performance enhancement
Level 4 *Acts as a role model for flexible communication strategies, i.e., those strategies that value input from all health care team members and that resolve conflict when needed* *Communicates feedback and constructive criticism to senior colleagues*	● Mediates conflict and difficult dialogue when multiple practitioners are collaborating on care for a critically ill patient ● Informs the emergency department director and/or nurse manager about obstacles to patient care and suggests ways to overcome the issues (e.g., naloxone in triage)
Level 5 *Acts as a role model for communication skills necessary to lead or manage health care teams* *In complex situations, facilitates regular health care team-based feedback*	● Presents at conferences regarding effective communication and conflict mediation styles ● Coaches others in conflict mediation styles ● Organizes and leads a multidisciplinary meeting to organize an optimal care plan for an emergency department high-volume user
Assessment Models or Tools	● Direct observation ● Global assessment ● Medical record (chart) audit ● Multisource feedback

Curriculum Mapping	●
Notes or Resources	● Braddock CH, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: time to get back to basics. *JAMA*. 1999;282:2313-2320. https://pubmed.ncbi.nlm.nih.gov/10612318/. ● Dehon E, Simpson K, Fowler D, Jones A. Development of the faculty 360. *MedEdPORTAL*. 2015;11:10174. https://www.mededportal.org/doi/10.15766/mep_2374-8265.10174. ● François, J. Tool to assess the quality of consultation and referral request letters in family medicine. *Can Fam Physician*. 2011;57(5):574–575. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093595/. ● Green M, Parrott T, Cook G. Improving your communication skills. *BMJ.* 2012;344:e357 https://www.bmj.com/content/344/bmj.e357. ● Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: A review with suggestions for implementation. *Med Teach*. 2013;35(5):395-403. https://www.tandfonline.com/doi/abs/10.3109/0142159X.2013.769677?journalCode=imte20. ● Roth CG, Eldin KW, Padmanabhan V, Freidman EM. Twelve tips for the introduction of emotional intelligence in medical education. *Med Teach*. 2018;21:1-4. https://www.tandfonline.com/doi/abs/10.1080/0142159X.2018.1481499?journalCode=imte20.

Interpersonal and Communication Skills 3: Communication within Health Care Systems **Overall Intent:** To effectively communicate using a variety of methods	
Milestones	**Examples**
Level 1 *Accurately documents information in the patient's record and safeguards the patient's personal information* *Communicates through appropriate channels as required by institutional policy (e.g., patient safety reports, cell phone/pager usage)*	● Documents history and physical accurately ● Describes the availability of open notes and potential consequences of language used ● Communicates with care team using Health Insurance Portability and Accountability Act (HIPAA) compliant modalities ● Informs institution about potential patient safety concerns
Level 2 *Demonstrates organized diagnostic and therapeutic reasoning through the patient record in a timely manner* *Respectfully communicates concerns about the system*	● Organizes accurate documentation that outlines clinical reasoning and supports the treatment plan ● Recognizes that a communication breakdown has happened and respectfully brings the breakdown to the attention of the care team leader
Level 3 Accurately *reports diagnostic and therapeutic reasoning in the patient record* *Uses appropriate channels to offer clear and constructive suggestions for improving the system*	● Documents complex clinical thinking concisely and accurately ● Describes when to direct concerns or suggestions for improvement locally, departmentally, or institutionally, i.e., appropriate escalation
Level 4 *Communicates clearly, concisely, and contemporaneously in an organized written form, including anticipatory guidance* *Initiates difficult conversations with appropriate stakeholders to improve the system*	● Frequently incorporates anticipatory guidance into documentation ● Talks directly to the referring physician about breakdowns in communication to prevent recurrence
Level 5 *Models feedback to improve others' written communication* *Facilitates dialogue regarding systems issues among larger community stakeholders (e.g., institution, the health care system, and/or the field)*	● Participates in a task force established by the hospital quality improvement committee to develop a plan to improve house staff hand-offs ● Participates in a committee to examine community emergency response systems including psychiatric emergencies
Assessment Models or Tools	● Direct observation

	● Medical record (chart) audit ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	● Bierman JA, Hufmeyer KK, Liss DT, Weaver AC, Heiman HL. Promoting responsible electronic documentation: Validity evidence for a checklist to assess progress notes in the electronic health record. *Teach Learn Med.* 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. ● Starmer AJ, Spector ND, Srivastava R, et al. I-pass, a mnemonic to standardize verbal handoffs. *Pediatrics*. 2012;129.2:201-204. https://pediatrics.aappublications.org/content/129/2/201.long?sso=1&sso_redirect_count=1&nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token. ● VirtalSmarts. Crucial Moments in Healthcare. https://www.vitalsmarts.com/healthcare/. Accessed 2021.

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 where the subcompetencies 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: Exposure Assessment: History and Physical	PC1: Clinical Reasoning: Differential Diagnosis
PC2: Clinical Reasoning: Ordering and Interpretation of Studies and Differential Diagnosis	PC1: Clinical Reasoning: Differential Diagnosis PC2: Ordering and Interpreting Studies
PC3: Management Plan and Treatment	PC3: Management Plan and Treatment
	PC4: Substance Use and Withdrawal
MK1: Acute and Chronic Exposure	MK1: Pathophysiology of Poisoning
MK2: Epidemiology and Population Exposure	MK2: Population Exposure
MK3: Laboratory and Clinical Testing	MK3: Laboratory and Clinical Testing
	MK4: Substance Use and Withdrawal
	MK5: Occupational Medicine/Occupational Toxicology
SBP1: Patient Safety	SBP1: Patient Safety
SBP2: Clinical Application of Information Technology	ICS3: Communication within Health Care Systems
	SBP3: System Navigation for Patient-Centered Care SBP4: Population Health SBP5: Physician Role in Health Care Systems
PBLI1: Self-Directed Learning in Medical Toxicology	PBLI1: Evidence-Based and Informed Practice
PBLI2: Quality Improvement Project	SBP2: Quality Improvement
	PBLI2: Reflective Practice and Commitment to Personal Growth
PROF1: Professional Values	PROF1: Professional Behavior and Ethical Principles
PROF2: Accountability to patients, society, profession, and self	PROF2: Accountability/Conscientiousness PROF3: Self-Awareness and Well-Being
ICS1: Patients Families and Public	ICS1: Patient- and Family-Centered Communication
ICS2: Communication with Health Care Professionals	ICS2: Interprofessional and Team Communication

Available Milestones Resources

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

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

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

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

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

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

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

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

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

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

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

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

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