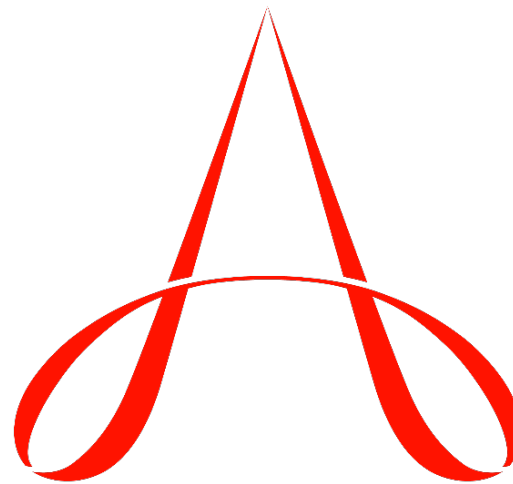




Supplemental Guide: Critical Care Anesthesiology



ACGME

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Critical Care Anesthesiology 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: Patient Assessment and Development of a Care Plan Overall Intent: To perform a patient assessment and develop and adapt a patient care plan	
Milestones	Examples
Level 1 <i>Efficiently gathers a focused history and physical examination to identify disease processes</i> <i>Formulates a differential diagnosis</i>	<ul style="list-style-type: none"> • Determines the typical glucose ranges, therapy regimen, compliance level, social circumstances, and resources available to a patient who presents with multiple hospitalizations for diabetic ketoacidosis • Performs a full body physical exam to look for open wounds or sources of infection that might lead to persistent hyperglycemia; orders laboratory values to rule out additional causes of an anion gap metabolic acidosis such as ingestion of ethanol, salicylates, or advancing kidney disease
Level 2 <i>Orders and interprets imaging and laboratory evaluation</i> <i>Formulates a care plan and communicates it to the team</i>	<ul style="list-style-type: none"> • Obtains a chest x-ray in a patient admitted with worsening shortness of breath; can distinguish common etiologies such as a pneumothorax, new infiltrates, edema, widened mediastinum • Starts broad-spectrum antibiotics and appropriate resuscitation in a patient with pneumonia and discusses treatment selection and duration with the multidisciplinary care team on rounds
Level 3 <i>Integrates data into a comprehensive patient assessment</i> <i>Develops and prioritizes a care plan</i>	<ul style="list-style-type: none"> • Determines that a patient admitted with worsening shortness of breath, elevated B-type natriuretic peptid, and a new murmur may have an acute valvular issue • Based on the situation above, orders an echocardiogram stat and consults the appropriate services if indicated based on the results
Level 4 <i>Continuously assesses the patient and recognizes unusual presentations</i> <i>Adapts care plan for complex clinical situations</i>	<ul style="list-style-type: none"> • Determines that a patient admitted with weakness, fatigue, and a recent viral infection is complaining of neck pain shows hemodynamic and lab concerns for evolving thyrotoxicosis • Patient admitted with septic shock and endocarditis develops acute cardiogenic shock requiring an emergent intervention and care coordination across multiple services
Level 5 <i>Serves as a peer reference for unusual presentations</i>	<ul style="list-style-type: none"> • Asked by a colleague to provide an opinion on the possible etiologies of acute intoxication with unknown exposure

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<i>Participates in the development of clinical pathways</i>	<ul style="list-style-type: none"> • Collaborates as part of a multidisciplinary enhanced recovery initiative for esophagectomy
Assessment Models or Tools	<ul style="list-style-type: none"> • Consult services evaluation • Direct observation • Multisource feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Textbook of critical care medicine

Patient Care 2: Crisis Management	
Overall Intent: To anticipate and manage patients during a crisis	
Milestones	Examples
Level 1 <i>Responds to crisis situations as a team coordinator</i>	<ul style="list-style-type: none"> • Responds to a rapid response or "code blue" as a team leader
Level 2 <i>Develops a differential diagnosis that includes the most likely etiologies for acute clinical deterioration</i>	<ul style="list-style-type: none"> • Gathers a history, focused physical exam, laboratory and imaging findings, and reviews recent care events to determine that a post-operative thoracotomy patient with hypotension, shortness of breath, anemia, and minimal chest tube output may have an hemothorax
Level 3 <i>Determines the level of patient acuity to prioritize and implement an actionable care plan</i>	<ul style="list-style-type: none"> • Identifies if a patient is stable enough to undergo imaging studies or needs to proceed directly to intervention (the unstable patient would need emergent operative exploration)
Level 4 <i>Independently anticipates clinical deterioration and leads the multidisciplinary team</i>	<ul style="list-style-type: none"> • Identifies that a patient with worsening shortness of breath is not as responsive and has labored breathing requiring an airway intervention before proceeding further in care evaluation
Level 5 <i>Triages available institutional resources to effectively resolve patient deterioration</i>	<ul style="list-style-type: none"> • Consults with the response team, pharmacy, phlebotomy services, and cardiology to order necessary labs, medications, and activate the catheter lab teams in a patient with ST changes
Assessment Models or Tools	<ul style="list-style-type: none"> • Consult services evaluation • Direct observation • Multisource feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Reader TW, Flin R, Mearns K, Cuthbertson BH. Developing a team performance framework for the intensive care unit. <i>Crit Care Med.</i> 2009 May;37(5):1787-93.

Patient Care 3: Procedural Skills/Technical Abilities/Interpretation Overall Intent: To perform and interpret procedures in the intensive care unit (ICU)	
Milestones	Examples
<p>Level 1 <i>Selects equipment, performs common intensive care unit (ICU) procedures (e.g., peripheral arterial or central venous catheterization), and recognizes complications, with guidance</i></p> <p><i>Interprets data obtained from common ICU procedures, with guidance</i></p>	<ul style="list-style-type: none"> ● Performs central venous catheterization under guidance and correctly obtains and interprets post-procedure chest radiograph ● Selects the correct type of central venous catheter based on the indications ● Interprets abnormal arterial waveforms under guidance
<p>Level 2 <i>Performs advanced ICU procedures (e.g., bronchoscopy, chest tube), with guidance</i></p> <p><i>Interprets data obtained from advanced ICU procedures, with guidance</i></p>	<ul style="list-style-type: none"> ● Performs thoracentesis under guidance ● Performs point-of-care ultrasound examination under guidance ● Under guidance, interprets findings obtained from the point-of-care ultrasound examination
<p>Level 3 <i>Performs common and advanced ICU procedures and troubleshoots common complications</i></p> <p><i>Synthesizes data obtained from common and advanced ICU procedures to modify the care plan</i></p>	<ul style="list-style-type: none"> ● Performs bedside bronchoscopy and recognizes hypoxemia following flexible bronchoscopy procedures ● Interprets lung sliding, A lines, and B lines independently on thoracic ultrasound; can discern the difference between B-line and B-prime profiles on the lung ultrasound
<p>Level 4 <i>Proficiently performs common and advanced ICU procedures and troubleshoots complex complications</i></p> <p><i>Proficiently synthesizes data obtained and identifies unusual findings from common and advanced ICU procedures</i></p>	<ul style="list-style-type: none"> ● Places transvenous pacing for temporary cardiac pacing; troubleshoots loss of capture and identifies presence of a new friction rub or pacing of thoracic wall as indicators of ventricular free wall rupture ● Synthesizes data from cardiac ultrasound to diagnose pericardial tamponade
<p>Level 5 <i>Serves as a consultant for performing difficult procedures</i></p>	<ul style="list-style-type: none"> ● Is asked by peers to place central venous catheters after multiple failed attempts

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<i>Introduces new evidence-based ICU procedures</i>	<ul style="list-style-type: none"> • Develops new ultrasound protocol
Assessment Models or Tools	<ul style="list-style-type: none"> • Direct observation • Multisource feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Leatherman JW, Marini J. Interpretation of hemodynamic waveforms. In: Hall JB, Schmidt GA, Kress JP. eds. <i>Principles of Critical Care</i>, 4th ed. McGraw Hill; 2014. • McConville JF, Patel BK. intravascular Devices in the ICU. In: Hall JB, Schmidt GA, Kress JP. eds. <i>Principles of Critical Care</i>, 4th ed. McGraw Hill; 2014. • Pronovost P, Needham D, Berenholtz S, Sinopoli D, Chu H, Cosgrove S, Sexton B, Hyzy R, Welsh R, Roth G, Bander J, Kepros J, Goeschel C. An intervention to decrease catheter-related bloodstream infections in the ICU. <i>N Engl J Med</i>. 2006 Dec 28;355(26):2725-32. doi: 10.1056/NEJMoa061115. Erratum in: <i>N Engl J Med</i>. 2007 Jun 21;356(25):2660. PMID: 17192537.

Patient Care 4: Respiratory Failure and Ventilation Management Overall Intent: To manage patients with respiratory failure using various mechanical strategies	
Milestones	Examples
<p>Level 1 <i>Recognizes respiratory failure and develops a differential diagnosis and care plan, with guidance</i></p> <p><i>Selects and implements basic ventilation strategies (e.g., assist control, pressure support, non-invasive strategies)</i></p>	<ul style="list-style-type: none"> ● Appropriately evaluates patients with respiratory failure and develops a care plan based on the underlying etiology, for example identifying hypoxemic versus ventilatory failure ● Implements and manages the use of supplemental oxygen, non-invasive ventilatory support, and mechanical ventilation in critically ill patients with respiratory failure
<p>Level 2 <i>Integrates relevant data to develop a patient care plan</i></p> <p><i>Selects from a variety of modes of ventilation or respiratory care techniques and initiates the appropriate interventions to optimize gas exchange and minimize complications</i></p>	<ul style="list-style-type: none"> ● Understands the patient population who can be successfully managed by non-invasive mechanical ventilation ● Selects the appropriate mode and ventilatory settings based on the patient's underlying pathology
<p>Level 3 <i>Identifies more complex etiologies for respiratory failure</i></p> <p><i>Identifies the need for advanced intervention (e.g., extracorporeal membrane oxygenation (ECMO), inhaled vasodilators) and adjunctive therapies (e.g., proning, nitric)</i></p>	<ul style="list-style-type: none"> ● Identifies etiologies such as right-to-left shunts (e.g., intracardiac shunts or pulmonary arteriovenous malformations) as cause of hypoxemia ● Identifies patients with severe acute respiratory distress syndrome (ARDS) and hypoxemia who may require extracorporeal lung support
<p>Level 4 <i>Continuously assesses a patient and recognizes unusual presentations</i></p> <p><i>Independently implements and adapts evidence-based ventilation strategies and advanced interventions</i></p>	<ul style="list-style-type: none"> ● Proficiently assess patients with respiratory failure and recognized etiologies such as orthodeoxia and platypnea in a patient with cirrhosis ● Understands the evidence base for the effect of prone positioning in reducing mortality in patients with moderate to severe ARDS
<p>Level 5 <i>Serves as a consultant to respiratory care service in development of policies and procedures to optimize patient care</i></p>	<ul style="list-style-type: none"> ● Develops respiratory care protocols for appropriate resource use and to improve patient care

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<p><i>Directs evidenced-based protocol development and refinement of ventilator strategies</i></p>	<ul style="list-style-type: none"> • Develops institutional guidelines on ventilator weaning and educates the multidisciplinary team on the latest evidence on the subject
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Direct observation • Multisource feedback
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> •
<p>Notes or Resources</p>	<ul style="list-style-type: none"> • Fielding-Singh V, Matthay MA, Calfee CS. Beyond low tidal volume ventilation: Treatment adjuncts for severe respiratory failure in acute respiratory distress syndrome. <i>Crit Care Med.</i> 2018;46(11):1820-1831

Patient Care 5: Management of Organ Dysfunction: Shock	
Overall Intent: To manage patients with shock	
Milestones	Examples
<p>Level 1 <i>Recognizes a patient in circulatory shock and initiates indicated therapies</i></p> <p><i>Initiates a basic diagnostic work-up to delineate the etiology of circulatory shock</i></p>	<ul style="list-style-type: none"> ● Recognizes clinical and laboratory parameters of shock and initiates resuscitation ● Uses point of care ultrasonography to determine the etiology of the shock state
<p>Level 2 <i>Identifies the underlying etiology for a shock state, actively manages the resuscitation, and continually assesses the response to therapy</i></p> <p><i>Utilizes advance diagnostic modalities, with knowledge of advantages and limitations of each, to determine the etiology of shock</i></p>	<ul style="list-style-type: none"> ● Identifies septic shock and implements Surviving Sepsis Campaign guidelines ● Uses transthoracic echocardiography to determine response to a volume challenge ● Uses transthoracic echocardiography to diagnose cardiogenic shock; understands the limitations of critical care echocardiography in diagnosing valvular pathologies
<p>Level 3 <i>Actively manages an unstable patient in a shock state, anticipates and acts to minimize multisystem organ dysfunction, and recognizes atypical or subtle presentations of shock</i></p> <p><i>Incorporates data from advanced diagnostic modalities to develop treatment plans</i></p>	<ul style="list-style-type: none"> ● Manages hypotension and respiratory distress in a septic patient ● Identifies myopathy caused by sepsis, and promotes early mobility in ICU patients ● Incorporates data obtained from arterial line wave-form analysis and echocardiography to determine volume status in a patient with circulatory shock
<p>Level 4 <i>Anticipates and acts independently to minimize the long-term consequences of circulatory shock and associated organ dysfunction</i></p> <p><i>Synthesizes data from advanced diagnostic modalities to develop a comprehensive treatment plan</i></p>	<ul style="list-style-type: none"> ● Identifies myopathy caused by sepsis, and promotes early mobility in ICU patients without prompts from the attending faculty member ● Incorporates data obtained from pulmonary artery catheter and echocardiography to determine the need for mechanical circulatory support in a patient with cardiogenic shock

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<p>Level 5 <i>Is recognized by others as a resource in the management of shock and multisystem organ failure</i></p> <p><i>Develops diagnostic algorithms for the diagnosis and management of circulatory shock</i></p>	<ul style="list-style-type: none"> ● Is asked by peers to review complex cases of circulatory shock and to provide management recommendations ● Develops institutional guidelines and management strategies for patients in circulatory shock due to post-cardiopulmonary bypass vasoplegic syndrome
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> ● Direct observation ● Faculty feedback ● Multisource feedback ● Simulation
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> ●
<p>Notes or Resources</p>	<ul style="list-style-type: none"> ● Cecconi M, De Backer D, Antonelli M, et al. Consensus on circulatory shock and hemodynamic monitoring. Task force of the European Society of Intensive Care Medicine. <i>Intensive Care Med.</i> 2014;40(12):1795-1815. ● Hiemstra, Bart; Eck, Ruben J.; Keus, Frederik; van der Horst, Iwan C.C. Clinical examination for diagnosing circulatory shock. <i>Current Opinion in Critical Care</i> 2017; 23(40): 293-301. ● Vahdatpour C, Collins D, Goldberg S. Cardiogenic Shock. <i>J Am Heart Assoc.</i> 2019 Apr 16;8(8):e011991.

Medical Knowledge 1: Pharmacology	
Overall Intent: To integrate knowledge of pharmacology into care plans for critically ill patients	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of the pharmacology, clinical indications, and application of medications used in the care of critically ill patients, including vasoactive drugs, sedatives, analgesics, immunotherapy, and antibiotics</i>	<ul style="list-style-type: none"> • Discusses the differences between vasoactive agents and their mechanisms of action
Level 2 <i>Applies knowledge of the pharmacology, clinical indications, and selection of medications used in the care of critically ill patients</i>	<ul style="list-style-type: none"> • Appropriately selects and uses vasoactive medications based on the patient's presentation
Level 3 <i>Applies knowledge of the pharmacology, clinical indications, and selection of medications used in the care of complex critically ill patients</i>	<ul style="list-style-type: none"> • Appropriately selects and uses sedation and analgesic agents for patients on ECMO
Level 4 <i>Integrates knowledge of pharmacology, clinical indications, and selection of medications (including medication interactions) to care for critically ill patients</i>	<ul style="list-style-type: none"> • Appropriately adjusts antibiotic dosing based on patient presentation and/or other pharmacologic agents that the patient is receiving • Changes medication selection due to patient becoming refractory to current regimen
Level 5 <i>Serves as a consultant in pharmacotherapy for critically ill patients</i>	<ul style="list-style-type: none"> • Assists peers in the appropriate selection of antibiotics for complex intra-abdominal infections
Assessment Models or Tools	<ul style="list-style-type: none"> • Direct observation • Medical record (chart) audit • Multisource feedback • Standardized examinations (e.g., Multidisciplinary Critical Care Knowledge Assessment Program)
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Joyce, MF, Berg, S, Bittner, EA, "Practical strategies for increasing efficiency and effectiveness in critical care education." <i>World Journal of Critical Care Medicine</i> 2017; 6(1):1.

- O'Donnell, John M., and Flávio E. Nácul, eds. *Surgical Intensive Care Medicine*. Springer; 2016.
- Society of Critical Care Medicine, Multidisciplinary Critical Care Knowledge Assessment Program (MCKAP): <https://www.sccm.org/Education-Center/Educational-Programming/MCKAP>. Accessed 2021.

Medical Knowledge 2: Pathophysiology of Critical Illness Overall Intent: To understand the pathophysiology of critical illness	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of common pathophysiology and complications related to critical illness</i>	<ul style="list-style-type: none"> • Describes the pathophysiology and treatment of patients with sepsis
Level 2 <i>Applies knowledge of common pathophysiology and complications to treat critical illness</i>	<ul style="list-style-type: none"> • Describes etiologies of acute kidney injury and the diagnostic work-up to differentiate between the etiologies
Level 3 <i>Applies knowledge of complex pathophysiology and complications to treat critical illness</i>	<ul style="list-style-type: none"> • Describes the evidence-based and comprehensive management of a patient with ARDS
Level 4 <i>Serves as a resource for knowledge of pathophysiology and complications related to critical illness</i>	<ul style="list-style-type: none"> • Teaches residents about the pathophysiology of and treatment approaches to a patient with sepsis
Level 5 <i>Is recognized as an expert in synthesizing and prioritizing differential diagnosis complex critical care conditions and anticipating potential complications</i>	<ul style="list-style-type: none"> • Develops institutional guidelines for the management of a patient with ARDS
Assessment Models or Tools	<ul style="list-style-type: none"> • Direct observation • Medical record (chart) audit • Multisource feedback • Standardized examinations (e.g., Multidisciplinary Critical Care Knowledge Assessment Program)
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Cooper AZ, Verbeck N, McCallister JW, Spitzer CR. Incorporating retrieval practice into intensive care unit teaching rounds: A feasibility study. <i>J Grad Med Educ.</i> 2020;12(6):778-781. https://meridian.allenpress.com/jgme/article/12/6/778/447989/Incorporating-Retrieval-Practice-Into-Intensive. • Joyce, MF, Berg, S, Bittner, EA, "Practical strategies for increasing efficiency and effectiveness in critical care education." <i>World Journal of Critical Care Medicine</i> 2017; 6(1):1.

- O'Donnell, John M., and Flávio E. Nácul, eds. *Surgical Intensive Care Medicine*. Springer, 2016.
- Society of Critical Care Medicine. Multidisciplinary Critical Care Knowledge Assessment Program (MCKAP): <https://www.sccm.org/Education-Center/Educational-Programming/MCKAP>. Accessed 2021.

Systems-Based Practice 1: Patient Safety and Quality Improvement (QI) Overall Intent: To engage in the analysis and management of patient safety events, including relevant communication with patients, families, and health care professionals; to conduct a QI project	
Milestones	Examples
<p>Level 1 <i>Demonstrates knowledge of common events that impact patient safety</i></p> <p><i>Demonstrates knowledge of how to report patient safety events</i></p> <p><i>Demonstrates knowledge of basic quality improvement methodologies and metrics</i></p>	<ul style="list-style-type: none"> ● Lists patient misidentification or medication errors as common patient safety events ● Explains how to report errors in own health system ● Describes fishbone tool
<p>Level 2 <i>Identifies system factors that lead to patient safety events</i></p> <p><i>Reports patient safety events through institutional reporting systems (simulated or actual)</i></p> <p><i>Describes departmental quality improvement initiatives</i></p>	<ul style="list-style-type: none"> ● Identifies a recent change to the transfusion requisition form that did not include space for two-person verification to avoid an error ● Reports lack of compliance with adherence to institutional requirements for aseptic technique ● Summarizes protocols to decrease ventilator associated acute lung injury
<p>Level 3 <i>Participates in analysis of patient safety events (simulated or actual)</i></p> <p><i>Participates in disclosure of patient safety events to patients and patients' families (simulated or actual)</i></p> <p><i>Participates in department quality improvement initiatives</i></p>	<ul style="list-style-type: none"> ● Assimilates patient data, evaluates the root cause, and presents the findings of a patient safety event ● Through simulation, communicates with patients/families about a medication administration error ● Participates in a root cause analysis of catheter associated infections
<p>Level 4 <i>Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)</i></p>	<ul style="list-style-type: none"> ● Collaborates with a team to conduct the analysis of medication administration errors and presents suggested policy and electronic health record (EHR) design changes at a department meeting

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<p><i>Discloses patient safety events to patients and patients' families (simulated or actual)</i></p> <p><i>Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project</i></p>	<ul style="list-style-type: none"> ● Discusses with patient (family) an inadvertent medication error ● Initiates and develops a fellow quality improvement project to improve team hand-offs and presents findings to the department
<p>Level 5 <i>Actively engages teams and processes to modify systems to prevent patient safety events</i></p> <p><i>Role models or mentors others in the disclosure of patient safety events</i></p> <p><i>Creates, implements, and assesses quality improvement initiatives at the institutional level or above</i></p>	<ul style="list-style-type: none"> ● Assumes a leadership role at the departmental or institutional level for patient safety ● Conducts a simulation for disclosing patient safety events ● Initiates and completes a QI project to improve disclosure of serious adverse events to patients and families and shares results with stakeholders
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> ● Direct observation ● E-module multiple choice tests ● Multisource feedback ● Portfolio ● Objective structured clinical exam (OSCE) ● Reflection ● Simulation
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> ●
<p>Notes or Resources</p>	<ul style="list-style-type: none"> ● Anesthesia Patient Safety Foundation (ASPF). Patient Safety Initiatives. https://www.apsf.org/patient-safety-initiatives/. Accessed 2020. ● Institute of Healthcare Improvement. http://www.ihp.org/Pages/default.aspx. Accessed 2020.

<p align="center">Systems-Based Practice 2: System Navigation for Patient-Centered Care</p> <p>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</p>	
Milestones	Examples
<p>Level 1 <i>Demonstrates knowledge of care coordination</i></p> <p><i>Identifies key elements for safe and effective transitions of care and hand-offs</i></p> <p><i>Demonstrates knowledge of population and community health needs and inequities</i></p>	<ul style="list-style-type: none"> ● For a critically ill patient, identifies the intensivist, fellows, residents, respiratory therapists, nurses, social workers, and ICU pharmacist as members of the team ● Lists the essential components of a standardized tool for sign-out, care transition, and hand-offs ● Identifies that inpatients may have different needs than ambulatory patients; identifies barriers to discharge home for ambulatory patients ● Identifies barriers in refilling medications for members of underserved populations
<p>Level 2 <i>Coordinates care of patients in routine clinical situations effectively using the roles of interprofessional team members</i></p> <p><i>Performs safe and effective transitions of care/hand-offs in routine clinical situations</i></p> <p><i>Identifies specific population and community health needs and inequities for the local population</i></p>	<ul style="list-style-type: none"> ● Coordinates care with the ICU team on arrival to ICU ● Routinely uses a standardized tool for a stable patient during ICU sign-out ● Identifies challenges in communicating with patients with communication barriers (e.g., non-English-speaking patients and families; hearing, visual or cognitive impairment;)
<p>Level 3 <i>Coordinates care of patients in complex clinical situations effectively using the roles of interprofessional team members</i></p> <p><i>Performs safe and effective transitions of care/hand-offs in complex clinical situations</i></p> <p><i>Uses institutional resources effectively to meet the needs of a patient population and community</i></p>	<ul style="list-style-type: none"> ● Works with the patient, family, and members of the care team to coordinate the care of a patient with a do-not-resuscitate order ● Routinely uses a standardized tool when transferring a patient to and from the ICU ● Follows institutional guidelines to provide safe care for a Jehovah’s Witness patient with anemia

<p>Level 4 <i>Role models effective coordination of patient-centered care among different disciplines and specialties</i></p> <p><i>Role models and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems</i></p> <p><i>Participates in changing and adapting practice to provide for the needs of specific populations</i></p>	<ul style="list-style-type: none"> ● During ICU rounds, leads team members in approaching consultants to review cases/recommendations and arranges multidisciplinary rounds for the team ● Prior to rotating off the ICU service, proactively informs the incoming fellow about a plan of care for a patient awaiting a liver transplant with multiple studies pending ● Assists in the design of protocols for discussing and managing blood product usage in patients who refuse blood products for religious reasons
<p>Level 5 <i>Analyzes the process of care coordination and participates in the design and implementation of improvements</i></p> <p><i>Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes</i></p> <p><i>Advocates for populations and communities with health care inequities in the peri-operative setting</i></p>	<ul style="list-style-type: none"> ● Develops a program to arrange for admission assessment of immunocompromised patients ● Devises a protocol to improve transitions from ICU to step down or monitored unit ● Leads development of telehealth support services for a community hospital ICU ● Partners with the multidisciplinary health care team to create an innovative approach to support disadvantaged patients in refilling medications
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> ● Direct observation ● Medical record (chart) audit ● Multisource feedback ● OSCE ● Quality metrics and goals mined from EHRs ● Review of sign-out tools, use and review of checklists
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> ●
<p>Notes or Resources</p>	<ul style="list-style-type: none"> ● CDC. Population Health Training in Place Program (PH-TIPP). https://www.cdc.gov/pophealthtraining/whatis.html. Accessed 2020. ● Kaplan KJ. In pursuit of patient-centered care. March 2016. http://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns. Accessed 2020.

- Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD. *AMA Education Consortium: Health Systems Science*. 1st ed. Philadelphia, PA: Elsevier; 2016. https://commerce.ama-assn.org/store/ui/catalog/productDetail?product_id=prod2780003..

Systems-Based Practice 3: Physician Role in Health Care Systems	
Overall Intent: To understand the physician’s role in the complex health system and how to optimize the system to improve patient care and the health system’s performance	
Milestones	Examples
<p>Level 1 <i>Identifies key components of the complex health care system (e.g., hospital, skilled nursing facility, finance, personnel, technology)</i></p> <p><i>States factors impacting the costs of critical care</i></p>	<ul style="list-style-type: none"> ● Identifies that notes and records must meet billing and coding requirements ● Explains relative cost of medications, monitors, and supplies
<p>Level 2 <i>Describes how components of a complex health care system are interrelated, and how this impacts patient care</i></p> <p><i>Documents patient details to facilitate accurate billing and reimbursement</i></p>	<ul style="list-style-type: none"> ● Prioritizes planning for tracheostomy/gastrostomy for a patient with severe traumatic brain injury prior to discharge to a skilled nursing facility ● Documents all Centers for Medicare and Medicaid Services (CMS)-required components of critical care notes
<p>Level 3 <i>Discusses how individual practice affects the broader system (e.g., length of stay, readmission rates, clinical efficiency)</i></p> <p><i>Explains the impact of documentation on billing and reimbursement</i></p>	<ul style="list-style-type: none"> ● Ensures that critically ill patients receive ICU liberation bundle to reduce readmissions ● Discusses the necessity of including the ultrasound image for an ultrasound guided procedure to receive reimbursement
<p>Level 4 <i>Manages various components of the complex health care system to provide efficient and effective patient care and transition of care</i></p> <p><i>Practices and advocates for cost-effective patient care</i></p>	<ul style="list-style-type: none"> ● Effectively works with the social work team to ensure interpretive services are available for non-English-speaking patients ● Effectively plans and implements rapid recovery protocols
<p>Level 5 <i>Advocates for or leads systems change that enhances high-value, efficient, and effective patient care</i></p> <p><i>Engages in external activities related to advocacy for cost-effective care</i></p>	<ul style="list-style-type: none"> ● Collaborates with multidisciplinary team to develop systems-based recovery protocols ● Improves informed consent process for non-English-speaking patients requiring interpreter services

Assessment Models or Tools	<ul style="list-style-type: none"> ● Direct observation ● Medical record (chart) audit ● Patient satisfaction data ● Portfolio
Curriculum Mapping	<ul style="list-style-type: none"> ●
Notes or Resources	<ul style="list-style-type: none"> ● Agency for Healthcare Research and Quality (AHRQ). Measuring the Quality of Physician Care. https://www.ahrq.gov/talkingquality/measures/setting/physician/index.html. Accessed 2020. ● AHRQ. Major Physician Measurement Sets. https://www.ahrq.gov/talkingquality/measures/setting/physician/measurement-sets.html. Accessed 2020. ● Andreae MH, Gabry JS, Goodrich B, White RS, Hall C. Antiemetic prophylaxis as a marker of health care disparities in the National Anesthesia Clinical Outcomes Registry. <i>Anesth Analg</i>. 2018;126(2):588-599. https://journals.lww.com/anesthesia-analgesia/Fulltext/2018/02000/Antiemetic_Prophylaxis_as_a_Marker_of_Health_Care.35.aspx. ● Dzau VJ, McClellan M, Burke S, et al. Vital directions for health and health care: priorities from a National Academy of Medicine Initiative. <i>NAM Perspectives</i>. Discussion Paper, National Academy of Medicine, Washington, DC. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. ● Teja BJ, Sutherland TN, Barnett SR, Talmor DS. Cost-effectiveness research in anesthesiology. <i>Anesth Analg</i>. 2018;127(5):1196-1201. https://pubmed.ncbi.nlm.nih.gov/29570150/.

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 <i>Accesses and uses evidence in routine patient care</i>	<ul style="list-style-type: none"> ● Reviews the most recent practice advisory for sepsis management and applies to patients in the ICU
Level 2 <i>Articulates clinical questions and elicits patient preferences and values to guide evidence-based care</i>	<ul style="list-style-type: none"> ● In a patient with respiratory failure and underlying pulmonary disease, discusses the options for escalation of care and patient perspectives regarding the options.
Level 3 <i>Compares and applies the best available evidence, integrated with patient preference, to the care of complex patients</i>	<ul style="list-style-type: none"> ● Obtains, discusses, and applies evidence for the ICU management of a patient with severe chronic obstructive pulmonary disease ● Understands and appropriately uses clinical practice guidelines for the ICU management of a patient with respiratory failure in a patient with severe chronic obstructive pulmonary disease while eliciting their preferences
Level 4 <i>Appraises and applies evidence, even in the face of uncertainty and conflicting evidence, to guide individualized care</i>	<ul style="list-style-type: none"> ● Accesses the primary literature to discuss current evidence about transfusion thresholds in critically ill patients ● Reviews primary literature regarding administration of blood products in the ICU setting
Level 5 <i>Coaches others to appraise and apply evidence for complex patients and/or participates in the development of guidelines</i>	<ul style="list-style-type: none"> ● Leads clinical teaching on application of best practices in transfusion thresholds in different ICU patient populations ● Reviews evidence and develops processes to enhance staff safety guidelines (e.g., personal protective equipment (PPE)) in the ICU ● As part of the ICU team, develops airway protocols and rapid response teams for hospitals
Assessment Models or Tools	<ul style="list-style-type: none"> ● Direct observation ● Oral or written examinations ● Oral presentations ● Research and quality improvement projects
Curriculum Mapping	<ul style="list-style-type: none"> ●

Notes or Resources	<ul style="list-style-type: none">● American College of Surgeons (ACS). ACS NSQIP (National Surgical Quality Improvement Program) Surgical Risk Calculator. https://riskcalculator.facs.org/RiskCalculator/index.jsp. Accessed 2021.● American Thoracic Society. New Clinical Practice Guidelines on Non-Invasive Ventilation in Chronic Stable Hypercapnic COPD https://www.thoracic.org/about/newsroom/press-releases/journal/2020/new-clinical-practice-guidelines-on-non-invasive-ventilation-in-chronic-stable-hypercapnic-copd.php. Accessed 2021.● Crisafulli, E., Barbeta, E., Ielpo, A. et al. Management of severe acute exacerbations of COPD: an updated narrative review. <i>Multidiscip Respir Med</i> 2018;13(36). https://doi.org/10.1186/s40248-018-0149-0● Joint United Kingdom (UK) Blood Transfusion and Tissue Transplantation Services Professional Advisory Committee. Transfusion in critically ill patients. https://www.transfusionguidelines.org/transfusion-handbook/7-effective-transfusion-in-surgery-and-critical-care/7-2-transfusion-in-critically-ill-patients. Updated 2020. Accessed 2021.● Society of Critical Care Medicine. Sepsis Guidelines 2021. https://www.sccm.org/Clinical-Resources/Guidelines/Guidelines/Surviving-Sepsis-Guidelines-2021. Accessed 2021.
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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; to reflect on all domains of practice, personal interactions, and behaviors, and their impact on colleagues and patients (reflective mindfulness); to develop clear objectives and goals for improvement in some form of a learning plan	
Milestones	Examples
<p>Level 1 <i>Accepts responsibility for personal and professional development by establishing goals</i></p> <p><i>Identifies the factors that contribute to performance deficits</i></p> <p><i>Actively seeks opportunities to improve</i></p>	<ul style="list-style-type: none"> ● Completes self-reflective goals prior to meeting with the program director ● Identifies gaps in knowledge of mechanisms of drug choice and interactions ● Identifies that fatigue, stressors and perceived life-work imbalance contribute to performance deficits ● Asks for feedback from patients, families, and patient care team members ● Uses institutional provided resources to balance personal/professional commitments and obligations
<p>Level 2 <i>Demonstrates openness to performance data (feedback and other input) to form goals</i></p> <p><i>Analyzes and acknowledges the factors that contribute to performance deficits</i></p> <p><i>Designs and implements a learning plan, with prompting</i></p>	<ul style="list-style-type: none"> ● Integrates feedback to adjust ICU management of patients with hemodynamic instability ● Assesses technical skills and how they may lead to complications ● When prompted, develops individual education plan to improve their evaluation of patients with a history of post-operative neurocognitive dysfunction
<p>Level 3 <i>Seeks performance data episodically, with adaptability and humility</i></p> <p><i>Institutes behavioral change(s) to improve performance</i></p> <p><i>Independently creates and implements a learning plan</i></p>	<ul style="list-style-type: none"> ● Obtains chart data to determine immediate management of hemodynamic instability and options for management in different patient populations ● Completes focused literature review before caring for specific patient populations in the ICU, for example post cardiac surgery patients ● Implements strategies that improve behaviors such as trust, interdependence, genuineness, empathy, risk, team building, and success
<p>Level 4 <i>Intentionally seeks performance data consistently, with adaptability and humility</i></p>	<ul style="list-style-type: none"> ● Obtains a quarterly chart audit to determine management of hemodynamic instability based on differential diagnoses ● Assesses impact of management plans on ICU length of stay

<p><i>Considers alternatives to improve performance</i></p> <p><i>Integrates performance data to adapt the learning plan</i></p>	<ul style="list-style-type: none"> • After patient encounter, debriefs with the attending and other patient care team members to optimize future collaboration in the care of the patient and family • Based on audit of management of hemodynamic instability based on differential diagnoses, identifies knowledge gaps and reads current practice guidelines to improve care
<p>Level 5 <i>Role models consistently seeking performance data with adaptability and humility</i></p> <p><i>Models reflective practice</i></p> <p><i>Facilitates the design and implementation of learning plans for others</i></p>	<ul style="list-style-type: none"> • Shares instances of near misses with more junior learners • Shares own performance gaps and adapted plan with other learners • Identifies and shares strategies to improve bronchoscopy • Assists more junior residents in developing their individualized learning plans
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Direct observation • Review of learning plan
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> •
<p>Notes or Resources</p>	<ul style="list-style-type: none"> • Chazot G, et al. Prevalence and risk factors of hemodynamic instability associated with preload-dependence during continuous renal replacement therapy in a prospective observational cohort of critically ill. <i>Annals of Intensive Care</i> 2021; 11(95). https://doi.org/10.1186/s13613-021-00883-9 • Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. <i>Academic Medicine</i>. 2009;84(8):1066-1074. https://journals.lww.com/academicmedicine/fulltext/2009/08000/Measurement_and_Correlates_of_Physicians_Lifelong.21.aspx. • 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. <i>Academic Medicine</i>. 2013;88(10):1558-1563. https://journals.lww.com/academicmedicine/fulltext/2013/10000/Assessing_Residents_Written_Learning_Goals_and.39.aspx. • Reed S, Lockspeiser TM, Burke A, et al. Practical suggestions for the creation and use of meaningful learning goals in graduate medical education. <i>Academic Pediatrics</i>. 2016;16(1):20-24. https://www.academicpedsjnl.net/article/S1876-2859(15)00333-2/pdf.

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
<p>Level 1 <i>Identifies potential triggers for professionalism lapses</i></p> <p><i>Describes when and how to report lapses in professionalism</i></p> <p><i>Demonstrates knowledge of the ethical principles underlying patient care</i></p>	<ul style="list-style-type: none"> ● Describes the impact of fatigue on clinical performance ● Recognizes that personal “bias” may interfere with professionalism ● Identifies fatigue and lists available resources to mitigate impact from fatigue ● Describes institutional safety reporting systems to report a near miss, a process problem or patient event ● Articulates how the principle of “do no harm” applies to a patient who may not need a central line even though the learning opportunity exists ● Discusses the basic principles underlying ethics (e.g., beneficence, nonmaleficence, justice, autonomy) and professionalism (e.g., professional values and commitments), and how they apply in various situations (e.g., informed consent process)
<p>Level 2 <i>Demonstrates insight into professional behavior in routine situations</i></p> <p><i>Takes responsibility for one’s own professionalism lapses</i></p> <p><i>Analyzes straightforward situations using ethical principles</i></p>	<ul style="list-style-type: none"> ● Respectfully approaches a resident who is late to call shift about the importance of being on time ● Maintains patient confidentiality in public situations ● Notifies appropriate supervisor in a timely way when unable to fulfill a responsibility ● Identifies and applies ethical principles involved in informed consent when the resident is unclear of all the risks ● Identifies surrogate for impaired patients
<p>Level 3 <i>Demonstrates professional behavior in complex or stressful situations</i></p> <p><i>Recognizes need to seek help in managing and resolving complex interpersonal situations</i></p>	<ul style="list-style-type: none"> ● Appropriately responds to a distraught family member following a clinical decline or complication ● Appropriately handles conversations in the ICU during stressful situations such as acute blood loss and hemodynamic instability ● After noticing a colleague’s inappropriate social media post, reviews policies related to posting of content and seeks guidance

<p><i>Analyzes complex situations using ethical principles</i></p>	<ul style="list-style-type: none"> ● Offers treatment options for a terminally ill patient, free of bias, while recognizing own limitations, and consistently honoring the patient’s choice ● Reviews Jehovah’s Witness institutional policies and offers options for peri-operative management ● Reviews patient candidacy for advanced therapies (e.g., mechanical circulatory support) and communicates this assessment to patient, patient family, and other physicians on the care team without bias
<p>Level 4 <i>Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in oneself</i></p> <p><i>Actively solicits help and acts on recommendations to resolve complex interpersonal situations</i></p> <p><i>Recognizes and uses resources for managing and resolving ethical dilemmas</i></p>	<ul style="list-style-type: none"> ● Actively solicits the perspectives of others ● Models respect for patients and promotes the same from colleagues ● Recognizes and uses ethics consults, literature, risk-management/legal counsel to resolve ethical dilemmas ● Recognizes and manages situations of medical futility
<p>Level 5 <i>Coaches others when their behavior fails to meet professional expectations</i></p> <p><i>Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution</i></p>	<ul style="list-style-type: none"> ● Coaches others when their behavior fails to meet professional expectations and creates a performance improvement plan to prevent recurrence ● Identifies and seeks to address system-wide factors or barriers to promoting a culture of ethical behavior through participation in a work group, committee, or taskforce (e.g., ethics committee or an ethics subcommittee, risk management committee, root cause analysis review, patient safety or satisfaction committee, professionalism work group, Institutional Review Board, resident grievance committee)
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> ● Direct observation ● Global evaluation ● Multisource feedback ● Oral or written self-reflection ● OSCE ● Simulation
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> ●
<p>Notes or Resources</p>	<ul style="list-style-type: none"> ● American Society of Anesthesiologists (ASA). ASA Code of Ethics. https://www.asanet.org/code-ethics. Accessed 2020.

- American Medical Association. Ethics. <https://www.ama-assn.org/delivering-care/ama-code-medical-ethics>. Accessed 2020.
- Byyny RL, Papadakis MA, Paauw DS. *Medical Professionalism Best Practices*. Menlo Park, CA: Alpha Omega Alpha Medical Society; 2015. <https://alphaomegalpha.org/pdfs/2015MedicalProfessionalism.pdf>. Accessed 2019.
- Domen RE, Johnson K, Conran RM, et al. Professionalism in pathology: a case-based approach as a potential education tool. *Arch Pathol Lab Med*. 2017; 141:215-219. <https://pubmed.ncbi.nlm.nih.gov/27763788/>.
- Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. 1st ed. New York, NY: McGraw-Hill Education; 2014.

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 <i>Responds promptly to requests or reminders to complete tasks</i> <i>Takes responsibility for failure to complete tasks</i>	<ul style="list-style-type: none"> ● Responds promptly to reminders from program administrator to complete work hour logs ● Attends conferences and other educational activities on time ● Apologizes to team member(s) for unprofessional behavior without prompting
Level 2 <i>Performs tasks and responsibilities in a timely manner</i> <i>Recognizes situations that may impact one’s own ability to complete tasks and responsibilities in a timely manner</i>	<ul style="list-style-type: none"> ● Completes administrative tasks, documents safety modules, procedure review, and licensing requirements by specified due date ● Before going out of town, completes tasks in anticipation of lack of computer access while traveling
Level 3 <i>Performs tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations</i> <i>Takes responsibility for tasks not completed in a timely manner and identifies strategies to prevent recurrence</i>	<ul style="list-style-type: none"> ● Notifies attending of multiple competing demands on call, appropriately triages tasks, and asks for assistance from other residents or faculty members as needed ● Appropriately notifies residents and fellows on day service about overnight call events during transition of care or hand-off to avoid patient safety issues and compromise of patient care ● Apologizes to team member(s) for unprofessional behavior without prompting, offers solutions to prevent repeated behavior in the future
Level 4 <i>Prioritizes tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations</i> <i>Proactively implements strategies to ensure that the needs of patients, teams, and systems are met</i>	<ul style="list-style-type: none"> ● Takes responsibility for inadvertently omitting key patient information during hand-off and professionally discusses with the patient, family and interprofessional team ● Follows up with accepting physician at long-term, acute care facility regarding medically complicated patient just discharged to outside facility
Level 5 <i>Designs and implements an institutional systems approach to ensure timely task completion and shared responsibility</i>	<ul style="list-style-type: none"> ● Coordinates a multidisciplinary team to facilitate ICU transfers throughout the institution ● Leads multidisciplinary team in peri-operative root cause analysis to improve system practices around infection control
Assessment Models or Tools	<ul style="list-style-type: none"> ● Compliance with deadlines and timelines

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	<ul style="list-style-type: none">• Direct observation• Global evaluations• Multisource feedback• Self-evaluations and reflective tools• Simulation
Curriculum Mapping	<ul style="list-style-type: none">•
Notes or Resources	<ul style="list-style-type: none">• ASA. ASA Code of Ethics. https://www.asanet.org/code-ethics. Accessed 2020.• Code of conduct from fellow/resident institutional manual• Expectations of residency program regarding accountability and professionalism

Professionalism 3: 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 <i>Recognizes the importance of addressing personal and professional well-being</i>	<ul style="list-style-type: none"> ● Acknowledges own response to patient’s terminal illness ● Is receptive to feedback on missed emotional cues after a family meeting ● Discusses well-being concerns as they might affect performance
Level 2 <i>Lists available resources for personal and professional well-being</i> <i>Describes institutional resources that are meant to promote/support well-being</i>	<ul style="list-style-type: none"> ● Independently identifies and communicates impact of a personal family tragedy ● Completes e-learning modules (or other modality) related to fatigue management ● Demonstrates how to access an institutional crisis line ● Independently identifies the stress of relationship issues, difficult patients, and financial pressures, and seeks help
Level 3 <i>With assistance, proposes a plan to promote personal and professional well-being</i> <i>Recognizes which institutional factors affect well-being</i>	<ul style="list-style-type: none"> ● With the multidisciplinary team, develops a reflective response to deal with personal impact of difficult patient encounters and disclosures ● Identifies institutionally sponsored wellness programs ● Integrates feedback from the multidisciplinary team to develop a plan for identifying and responding to emotional cues during the next family meeting ● With supervision, assists in developing a personal learning or action plan to address factors potentially contributing to burnout
Level 4 <i>Independently develops a plan to promote personal and professional well-being</i> <i>Describes institutional factors that positively and/or negatively affect well-being</i>	<ul style="list-style-type: none"> ● Independently identifies ways to manage personal stress ● Self-assesses and seeks additional feedback on skills responding to emotional cues during a family meeting ● Works to prevent, mitigate and intervene early during stressful periods in the fellowship peer group
Level 5 <i>Creates institutional-level interventions that promote colleagues’ well-being</i>	<ul style="list-style-type: none"> ● Assists in organizational efforts to address clinician well-being after patient diagnosis/prognosis/death ● Works with multidisciplinary team to develop a feedback framework for learners around family meetings

<i>Describes institutional programs designed to examine systemic contributors to burnout</i>	<ul style="list-style-type: none"> ● Establishes a mindfulness program open to all employees
Assessment Models or Tools	<ul style="list-style-type: none"> ● Direct observation ● Group interview or discussions for team activities ● Individual interview ● Institutional online training modules ● Self-assessment and personal learning plan
Curriculum Mapping	<ul style="list-style-type: none"> ●
Notes or Resources	<ul style="list-style-type: none"> ● 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. Tools and Resources. https://dl.acgme.org/pages/well-being-tools-resources ● Local resources, including employee assistance programs (EAPs)

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 personal biases, and minimize them in the doctor-patient relationships; to organize and lead communication around shared decision making	
Milestones	Examples
<p>Level 1 <i>Communicates with patients and their families in an understandable and respectful manner</i></p> <p><i>Provides timely updates to patients and patients' families</i></p>	<ul style="list-style-type: none"> ● Introduces self and faculty member, identifies patient and others in the room, and engages all parties in health care discussion ● Provides updates to the family after an unanticipated ICU admission
<p>Level 2 <i>Customizes communication in the setting of personal biases and barriers with patients and patients' families</i></p> <p><i>Actively listens to patients and patients' families to elicit patient preferences and expectations</i></p>	<ul style="list-style-type: none"> ● Avoids medical jargon and restates patient and family perspectives when discussing patient's clinical status ● Responds to questions regarding the patient's level of support and addresses questions about overall condition
<p>Level 3 <i>Explains complex and difficult information to patients and patients' families</i></p> <p><i>Uses shared decision-making to make a personalized care plan</i></p>	<ul style="list-style-type: none"> ● Acknowledges patient and family goals of care and answers questions ● Elicits patient and family preference regarding resuscitation status and overall goals of care
<p>Level 4 <i>Facilitates difficult discussions with patients and patients' families</i></p> <p><i>Effectively negotiates and manages conflict among patients, patients' families, and the health care team</i></p>	<ul style="list-style-type: none"> ● Explains current level of organ dysfunction and elicits understanding of this information ● Ensures all family members understand the current clinical status and discusses role of decision makers as patient proxy
<p>Level 5 <i>Mentors others in the facilitation of crucial conversations</i></p> <p><i>Mentors others in conflict resolution</i></p>	<ul style="list-style-type: none"> ● Leads a discussion group on personal experience of moral distress ● Develops an ICU team curriculum on negotiating end of life decisions and working as a team with family to understand their perspectives. ● Serves on a hospital bioethics committee

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Assessment Models or Tools	<ul style="list-style-type: none"> ● Direct observation ● OSCE ● Self-assessment including self-reflection exercises ● Standardized patients
Curriculum Mapping	<ul style="list-style-type: none"> ●
Notes or Resources	<ul style="list-style-type: none"> ● Laidlaw A, Hart J. Communication skills: an essential component of medical curricula. Part I: Assessment of clinical communication: AMEE Guide No. 51. <i>Med Teach</i>. 2011;33(1):6-8. https://www.tandfonline.com/doi/full/10.3109/0142159X.2011.531170. ● Makoul G. Essential elements of communication in medical encounters: The Kalamazoo consensus statement. <i>Acad Med</i>. 2001;76:390-393. https://pubmed.ncbi.nlm.nih.gov/11299158/. ● Makoul G. The SEGUE Framework for teaching and assessing communication skills. <i>Patient Educ Couns</i>. 2001;45(1):23-34. https://pubmed.ncbi.nlm.nih.gov/11602365/. ● Symons AB, Swanson A, McGuigan D, Orrange S, Akl EA. A tool for self-assessment of communication skills and professionalism in residents. <i>BMC Med Educ</i>. 2009;9:1. https://bmcmmededuc.biomedcentral.com/articles/10.1186/1472-6920-9-1.

Interpersonal and Communication Skills 2: Complex Communication around Serious Illness Overall Intent: To sensitively and effectively communicate with patients and their families/caregivers about serious illness, promoting shared decision making and assessing the evolving impact on all involved	
Milestones	Examples
<p>Level 1 <i>Identifies the need to assess a patient's/patient's family's expectations and understanding of health status and treatment options</i></p> <p><i>Identifies key communication elements for shared decision making</i></p>	<ul style="list-style-type: none"> ● Recognizes importance of communicating prognosis to permit shared decision making, with assistance ● Values assessing patient/family understanding of health status and expectations, with assistance
<p>Level 2 <i>Assesses a patient's family's/caregiver's understanding of the patient's condition and identifies preferences for receiving information</i></p> <p><i>Facilitates communication with a patient/patient's family by introducing stakeholders, setting the agenda, clarifying expectations, and verifying an understanding of the clinical situation</i></p>	<ul style="list-style-type: none"> ● Uses open-ended questions to determine a patient's/family's prognostic awareness and discuss patient/family preferences for how communication about prognosis should occur ● Begins a family meeting for a patient with serious illness by asking the patient/family what they understand about the patient's clinical condition
<p>Level 3 <i>Delivers difficult information and attends to emotional responses of a patient and patient's family/caregivers</i></p> <p><i>Sensitively and compassionately delivers medical information; elicits a patient's/patient's family's values, goals, and preferences; and acknowledges uncertainty and conflict, with guidance</i></p>	<ul style="list-style-type: none"> ● Consistently responds to emotion in conversations by using NURSE statements (Name, Understand, Respect, Support, Explore) and deliberate silence ● Encourages patients and families to reflect on and clarify their goals and wishes ● Allows patients and families to reflect on the tradeoffs that might be necessary to achieve different outcomes ● Explores the sources and nature of fears allowing the patient and family to feel better understood and supported
<p>Level 4 <i>Tailors communication according to disease characteristics and trajectory, patient consent, patient's family's needs, and medical uncertainty, and is able to address intense emotional response</i></p>	<ul style="list-style-type: none"> ● Adjusts communication with family/caregivers to address uncertainty and conflicting prognostic estimates ● Runs a family meeting with more complex emotions, family dynamics ● Uses a structured format to guide discussions

<p><i>Independently uses shared decision making to align the patient's/patient's family's values, goals, and preferences with treatment options to make a personalized care plan in situations with a high degree of uncertainty and conflict</i></p>	<ul style="list-style-type: none"> ● Independently develops and provides a recommendation for a time-limited trial of ventilator support for a patient with acute respiratory distress syndrome, in the context of conflicting patient and family goals ● Documents important elements of the communication in the medical record
<p>Level 5 <i>Coaches others in the communication of prognostic information</i></p> <p><i>Coaches others in shared decision making in communication with a patient/patient's family</i></p>	<ul style="list-style-type: none"> ● Implements systematic approaches to communication including better education of clinicians, triggers for early family discussions, patient and family education, use of structured formats to guide discussions and providing dedicated sections in the EHR for recording information ● Develops a simulation module to teach communication of prognosis ● Develops a role play scenario to teach shared decision making
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> ● Direct observation ● Objective structured clinical examination
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> ●
<p>Notes or Resources</p>	<ul style="list-style-type: none"> ● Back A, Arnold R, Tulskey J. <i>Mastering Communication with Seriously Ill Patients</i>. Cambridge: Cambridge University Press, 2009. ● Back A, Arnold R, Baile W, Tulskey J, Fryer-Edwards K. Approaching difficult communication tasks in oncology. <i>CA Cancer J Clin</i>. 2005 May-Jun;55(3):164-77. ● Bernacki RE, Block SD, for the American College of Physicians High Value Care Task Force. Communication About Serious Illness Care Goals: A Review and Synthesis of Best Practices. <i>JAMA Intern Med</i>. 2014;174(12):1994-2003. Doi:10.1001/jamainternmed.2014.5271. ● Childers J, Back A, Tulskey J, Arnold M. REMAP: a framework for goals of care conversations. <i>J Oncol Pract</i>. 2017 Oct;13(10):e844-e850. doi: 10.1200/JOP.2016.018796. Epub 2017 Apr 26. ● Levetown, M. Communicating with children and families: from everyday interactions to skill in conveying distressing information. <i>Pediatrics</i>. 2008; 121(5):e1441-60. ● VitalTalk. www.vitaltalk.org. Accessed 2018.

Interpersonal and Communication Skills 3: Interprofessional and Team Communication Overall Intent: To effectively communicate with the health care team, including consultants, in both straightforward and complex situations	
Milestones	Examples
<p>Level 1 <i>Respectfully requests or receives consultations</i></p> <p><i>Uses language that values all members of the health care team</i></p> <p><i>Respectfully receives feedback from health care team members</i></p>	<ul style="list-style-type: none"> ● Consults cardiology for a patient with a history of angina and limited exercise capacity, relays essential information, and asks focused questions ● Receives a request for ICU admission, asks clarifying questions politely, and expresses appreciation for the motivation behind the consult request ● Acknowledges the contribution of each member of the patient care team during rounds
<p>Level 2 <i>Clearly, concisely, and promptly requests or responds to a consultation</i></p> <p><i>Communicates information effectively with all health care team members</i></p> <p><i>Solicits feedback on performance as a member of the health care team</i></p>	<ul style="list-style-type: none"> ● Communicates ICU admission decision with primary care team in a timely manner ● Communicates acute change in patient condition leading to the admission to the critical care team in a clear, concise, organized, and timely manner ● Discusses patient complications with supervising attending while reflecting on personal role in the patient's care
<p>Level 3 <i>Uses closed-loop communication to verify understanding</i></p> <p><i>Adapts communication style to fit team needs</i></p> <p><i>Communicates concerns and provides feedback to peers and learners</i></p>	<ul style="list-style-type: none"> ● While leading a resuscitation, clearly delegates tasks and asks if team members understand their roles ● Asks other members of the health care team to repeat back recommendations to ensure understanding ● When receiving treatment recommendations from an attending physician, repeats back the plan to ensure understanding ● Provides constructive feedback to a resident during central line insertion
<p>Level 4 <i>Coordinates recommendations from different members of the health care team to optimize patient care</i></p>	<ul style="list-style-type: none"> ● Collaborates with surgical colleagues to plan for post-operative ICU care

<p><i>Maintains effective communication in crisis situations</i></p>	<ul style="list-style-type: none"> ● Explains rationale for initiation of the massive transfusion protocol during active hemorrhage
<p><i>Communicates constructive feedback to superiors</i></p>	<ul style="list-style-type: none"> ● Cautions faculty member about an imminent medication administration error
<p>Level 5 <i>Role models flexible communication strategies that value input from all health care team members, resolving conflict when needed</i></p> <p><i>Facilitates regular health care team-based feedback in complex situations</i></p>	<ul style="list-style-type: none"> ● Mediates a conflict resolution between different members of the health care team ● Leads a post-code team debriefing
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> ● Direct observation ● Global assessment ● Medical record (chart) audit ● Multisource feedback ● Simulation
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> ●
<p>Notes or Resources</p>	<ul style="list-style-type: none"> ● AHRQ. Curriculum Materials. https://www.ahrq.gov/teamstepps/curriculum-materials.html. Accessed 2020. ● Dehon E, Simpson K, Fowler D, Jones A. Development of the faculty 360. <i>MedEdPORTAL</i>. 2015;11:10174. https://www.mededportal.org/publication/10174/. ● Green M, Parrott T, Cook G., Improving your communication skills. <i>BMJ</i>. 2012;344:e357. https://www.bmj.com/content/344/bmj.e357. Accessed 2020. ● Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: a review with suggestions for implementation. <i>Med Teach</i>. 2013;35(5):395-403. https://www.tandfonline.com/doi/full/10.3109/0142159X.2013.769677. Accessed 2020. ● Roth CG, Eldin KW, Padmanabhan V, Freidman EM. Twelve tips for the introduction of emotional intelligence in medical education. <i>Med Teach</i>. 2018:1-4. https://www.tandfonline.com/doi/full/10.1080/0142159X.2018.1481499. ● Tait AR, Teig MK, Voepel-Lewis T. Informed consent for anesthesia: A review of practice and strategies for optimizing the consent process. <i>Can J Anaesth</i>. 2014;61(9):832-842. https://pubmed.ncbi.nlm.nih.gov/24898765/.

Interpersonal and Communication Skills 4: Communication within Health Care Systems Overall Intent: To effectively communicate using a variety of methods	
Milestones	Examples
<p>Level 1 <i>Accurately records information in the patient record; demonstrates judicious use of documentation shortcuts</i></p> <p><i>Safeguards patient personal health information</i></p> <p><i>Communicates through appropriate channels as required by institutional policy</i></p>	<ul style="list-style-type: none"> ● Documentation is accurate but may include extraneous information ● Avoids talking about patients in the elevator, public spaces, or on social media ● Identifies institutional and departmental communication hierarchy for concerns and safety issues ● Only uses secure communication modalities when sharing protected health information
<p>Level 2 <i>Accurately gathers all essential medical records from other institutions</i></p> <p><i>Documents required data in formats specified by institutional policy</i></p> <p><i>Respectfully communicates concerns about the system</i></p>	<ul style="list-style-type: none"> ● Successfully completes requests for external records to be scanned into EHR ● Completes procedure note for an urgent ICU intubation using the appropriate template and correct elements ● Recognizes when a breakdown in communication has occurred and brings it to the attention of the involved parties and/or faculty member
<p>Level 3 <i>Accurately records information in the electronic health record (EHR) and communicates complex care decisions for complex cases</i></p> <p><i>Appropriately selects direct and indirect forms of communication based on context</i></p> <p><i>Respectfully communicates concerns about the system and contributes to solutions</i></p>	<ul style="list-style-type: none"> ● Documents critical event notes in the medical record concisely and in a timely manner ● Follows up with a patient in person regarding a difficult intubation ● Understands when to direct concerns locally, departmentally, or institutionally, i.e., appropriate escalation
<p>Level 4 <i>Uses EHR functionality to highlight challenges in anesthetic care to facilitate future peri-operative management</i></p>	<ul style="list-style-type: none"> ● Creates consistently accurate, organized, and concise documentation, frequently incorporating anticipatory guidance

<p><i>Models exemplary written or verbal communication</i></p> <p><i>Uses appropriate channels to offer clear and constructive suggestions to improve the system</i></p>	<ul style="list-style-type: none"> ● Develops a collection of exemplary patient notes which are used as examples to educate other trainees ● Communicates directly with a member of another department regarding a breakdown in communication and provides solutions to prevent recurrence
<p>Level 5 <i>Explores innovative uses of the EHR to facilitate effective critical care management</i></p> <p><i>Guides departmental or institutional policies and procedures around communication</i></p> <p><i>Initiates difficult conversations with appropriate stakeholders to improve the system</i></p>	<ul style="list-style-type: none"> ● Leads a task force to improve patient hand-offs using the EHR ● Actively participates in a committee to develop a pandemic disaster response plan ● Develops educational tools to improve difficult communication and implements them within the system
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> ● Direct observation ● Medical record (chart) audit ● Multisource feedback ● OSCE ● Simulation
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> ●
<p>Notes or Resources</p>	<ul style="list-style-type: none"> ● APSF. Improving Post Anesthesia Care Unit (PACU) Handoff By Implementing a Succinct Checklist. https://lhitrustfunds.com/wp-content/uploads/2015/07/PACU-handoff.pdf. ● 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. <i>Teach Learn Med.</i> 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. ● Haig KM, Sutton S, Whittington J. SBAR: a shared mental model for improving communication between clinicians. <i>Jt Comm J Qual Patient Saf.</i> 2006;32(3):167-175. https://www.jointcommissionjournal.com/article/S1553-7250(06)32022-3/fulltext. ● Starmer AJ, et al. I-pass, a mnemonic to standardize verbal handoffs. <i>Pediatrics.</i> 2012;129(2):201-204. https://pediatrics.aappublications.org/content/129/2/201?sso=1&sso_redirect_count=1&nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token.

Critical Care Anesthesiology Supplemental Guide

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: Patient Assessment and Development of a Care Plan	PC1: Patient Assessment and Development of a Care Plan
PC2: Crisis Management	PC2: Crisis Management
PC3: Procedural Skills/Technical Abilities/Interpretation	PC3: Procedural Skills/Technical Abilities/Interpretation
PC4: Management of Respiratory Failure	PC4: Respiratory Failure and Ventilation Management
PC5: Palliative Medicine/End-of-Life Care	
	PC5: Management of Organ Dysfunction and Shock
MK1: Pharmacology	MK1: Pharmacology
MK2: Medical Knowledge of Critical Care Medicine	MK2: Pathophysiology of Critical Illness
SBP1: Interprofessional and Transitions of Care	SBP2: Patient Safety and Quality Improvement (QI)
SBP2: Incorporation of Patient Safety and Quality Improvement into Clinical Practice	SBP1: System Navigation for Patient-Centered Care
SBP3: Understanding of Health Care Economics – cost awareness and cost-benefit analysis	SBP3: Physician Role in Health Care Systems
PBL11: Self-directed Learning and Scholarly Activity	PBL12: Reflective Practice and Commitment to Personal Growth
PBL12: Education of Team Members and Other Health Care Providers	ICS3: Interprofessional and Team Communication
	PBL11: Evidence-Based and Informed Practice
PROF1: Commitment to Institution, Department, and Colleagues	PROF1: Professional Behavior and Ethical Principles PROF2: Accountability/Conscientiousness
PROF2: Receiving and Giving Feedback	PBL12: Reflective Practice and Commitment to Personal Growth ICS3: Interprofessional and Team Communication
PROF3: Responsibility to Maintain Personal Emotional, Physical, and Mental Health	PROF3: Well-Being
ICS1: Communication with Patients and Families	ICS1: Patient- and Family-Centered Communication ICS2: Complex Communication Around Serious Illness

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/>