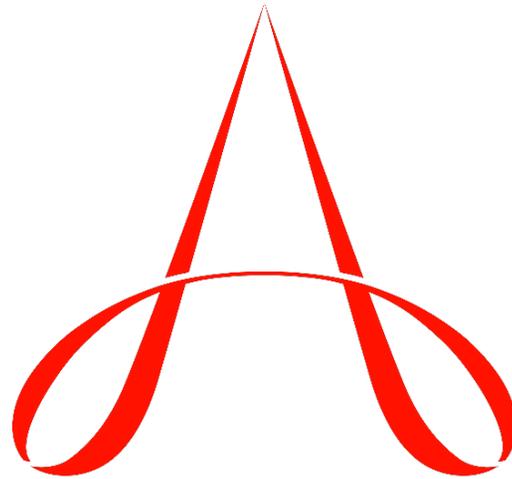




Supplemental Guide: Surgical Critical Care



ACGME

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Surgical Critical Care 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: Respiratory Failure	
Overall Intent: To evaluate and manage critically ill patients with respiratory failure and dysfunction	
Milestones	Examples
Level 1 <i>Requires direct supervision in basic management of patients with respiratory failure</i>	<ul style="list-style-type: none"> Needs prompting to recognize respiratory failure in critically ill patients and initiate appropriate interventions
Level 2 <i>Manages patients with respiratory failure</i>	<ul style="list-style-type: none"> Appropriately evaluates respiratory failure and implements and manages the use of supplemental oxygen, non-invasive ventilatory support, and mechanical ventilation in critically ill patients
Level 3 <i>Recognizes the need for and initiates advanced ventilator techniques for patients with respiratory failure</i>	<ul style="list-style-type: none"> Evaluates respiratory failure in critically ill patients and recognizes the need for prone positioning or airway pressure ventilation
Level 4 <i>Independently manages patients with respiratory failure, including use of advanced ventilator techniques</i>	<ul style="list-style-type: none"> Proficiently assesses critically ill patients with respiratory failure, and competently selects and manages advanced ventilatory support devices and modes
Level 5 <i>Is recognized as a resource or completes a quality improvement or research project regarding management of patients with respiratory failure</i>	<ul style="list-style-type: none"> Develops a quality improvement project to implement ventilator weaning guidelines and educates general surgery and other residents rotating in the intensive care unit (ICU) Develops guidelines for the initiation of prone ventilation in critically ill patients
Assessment Models or Tools	<ul style="list-style-type: none"> Direct observation and direct supervision Evaluation/feedback from trainees Evaluation from the interprofessional team (advance practice providers, nursing, respiratory therapists)
Curriculum Mapping	<ul style="list-style-type: none">
Notes or Resources	<ul style="list-style-type: none"> ARDS [Acute Respiratory Distress Syndrome] Definition Task Force, Ranieri VM, Rubenfeld GD, et al. Acute respiratory distress syndrome: the Berlin Definition. <i>JAMA</i>. 2012;307(23):2526-2533. https://jamanetwork.com/journals/jama/fullarticle/10.1001/jama.2012.5669. 2021. Fan E, Brodie D, Slutsky AS. Acute respiratory distress syndrome: Advances in diagnosis and treatment. <i>JAMA</i>. 2018;319(7):698-710. https://jamanetwork.com/journals/jama/article-abstract/2673154. 2021. 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. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6277052/pdf/nihms-1502549.pdf. 2021.

- Siegel MD. Acute respiratory distress syndrome: Clinical features, diagnosis, and complications in adults. *UpToDate*. <https://www.uptodate.com/contents/acute-respiratory-distress-syndrome-clinical-features-diagnosis-and-complications-in-adults>. 2021.

Patient Care 2: Nutritional Support	
Overall Intent: To manage critically ill patients with or at risk of malnutrition	
Milestones	Examples
Level 1 <i>Requires direct supervision in assessment and initial management of nutritional support in critically ill patients</i>	<ul style="list-style-type: none"> • Determines optimal enteral nutrition support with the assistance of a dietician
Level 2 <i>Recognizes the need for nutritional support in critically ill patients but still requires indirect supervision in the assessment and initial management</i>	<ul style="list-style-type: none"> • Selects formula and rate for enteral nutrition of a critically ill patient with review by dietician or critical care faculty member
Level 3 <i>Independently performs assessment of nutritional needs and initiates nutritional support in critically ill patients</i>	<ul style="list-style-type: none"> • Chooses optimal nutritional support (enteral/parenteral/mixed) for the critically ill patient
Level 4 <i>Independently performs nutritional assessment and manages nutritional support for special populations of critically ill patients, including traumatic brain injury, immunodeficient, extracorporeal membrane oxygenation (ECMO), complex gastrointestinal surgical patients</i>	<ul style="list-style-type: none"> • Formulates and initiates a plan of nutritional support for a complex general surgery patient with enterocutaneous fistulae
Level 5 <i>Is recognized as a resource or completes a quality improvement or research project in nutritional assessment and support of critically ill patients</i>	<ul style="list-style-type: none"> • Develops hospital-based nutritional support guidelines for critically ill patients • Educates general surgery residents on nutritional assessment and proper initiation and maintenance of nutritional support
Assessment Models or Tools	<ul style="list-style-type: none"> • Direct observation/supervision • Evaluation and feedback by more junior learners • Interprofessional team feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Elke G, van Zanten ARH, Lemieux M, et al. Enteral versus parenteral nutrition in critically ill patients: An updated systematic review and meta-analysis of randomized controlled trials. <i>Crit Care</i>. 2016;20(1):117. https://ccforum.biomedcentral.com/articles/10.1186/s13054-016-1298-1. 2021. • McClave SA, Taylor BE, Martindale RG, et al. Guidelines for the provision and assessment of nutrition support therapy in the adult critically-ill patient: Society of Critical Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.).

J Parenter Enteral Nutr. 2016;40(2):159-211.
<https://aspenjournals.onlinelibrary.wiley.com/doi/full/10.1177/0148607115621863>. 2021.

- Singer P, Reintam Blaser A, Berger MM, et al. ESPEN guidelines on clinical nutrition in the intensive care unit. *Clin Nutr.* 2019;38(1):48-79.
[https://www.clinicalnutritionjournal.com/article/S0261-5614\(18\)32432-4/fulltext](https://www.clinicalnutritionjournal.com/article/S0261-5614(18)32432-4/fulltext). 2021.

Patient Care 3: Shock/Resuscitation	
Overall Intent: To diagnose and manage patients demonstrating various forms of shock	
Milestones	Examples
Level 1 <i>Independently recognizes shock and initiates indicated resuscitation in critically ill patients</i>	<ul style="list-style-type: none"> Recognizes clinical and laboratory parameters of shock and uses them to manage resuscitation Recognizes hypoperfusion in a septic patient and gives a fluid bolus
Level 2 <i>Individualizes resuscitation based on the type of shock and assessment of the response to therapy, and employs monitoring for critically ill patients</i>	<ul style="list-style-type: none"> Identifies septic shock and implements Surviving Sepsis Campaign guidelines in a critically ill patient
Level 3 <i>Employs advanced monitoring techniques to guide resuscitation for critically ill patients, including special patient populations</i>	<ul style="list-style-type: none"> Independently determines type of shock and proficiently implements management plan in trauma patient with history of cirrhosis and chronic obstructive pulmonary disease (COPD) Uses bedside ultrasound to evaluate volume status in a critically ill patient with hypotension
Level 4 <i>Performs complex resuscitation, including use of advanced monitoring techniques, particularly in special patient populations</i>	<ul style="list-style-type: none"> Employs bedside ultrasound to evaluate cardiac function in a patient in septic shock who has pre-existing cardiac disease
Level 5 <i>Is recognized as a resource or completes a quality improvement or research project or develops a protocol for shock resuscitation</i>	<ul style="list-style-type: none"> Instructs residents in the use of advanced ultrasound techniques to evaluate volume status in a hypotensive patient
Assessment Models or Tools	<ul style="list-style-type: none"> Direct observation Evaluation from more junior residents in the ICU
Curriculum Mapping	<ul style="list-style-type: none">
Notes or Resources	<ul style="list-style-type: none"> Ho VP, Kaafarani H, Rattan R, et al. Sepsis 2019: What surgeons need to know. <i>Surg Infect (Larchmt)</i>. 2020;21(3):195-204. https://www.liebertpub.com/doi/10.1089/sur.2019.126?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%20pubmed. 2021. Nikravan S, Song P, Bughara N, Díaz-Gómez JL. Focused ultrasonography for septic shock resuscitation. <i>Current Opinion in Critical Care</i>. 2020;26(3):296-302. https://journals.lww.com/co-criticalcare/Abstract/2020/06000/Focused_ultrasonography_for_septic_shock.12.aspx. 2021.

- Surviving Sepsis. Guidelines and Bundles. <https://www.sccm.org/SurvivingSepsisCampaign/Guidelines>. 2021.
- Tisherman SA, Barie P, Bokhari F, et al. Clinical practice guideline: Endpoints of resuscitation. *The Journal of Trauma: Injury, Infection, and Critical Care*. 2004;57(4):898-912. https://journals.lww.com/jtrauma/Fulltext/2004/10000/Clinical_Practice_Guideline_Endpoints_of.34.aspx. 2021.

Patient Care 4: Renal Disorders of Critically Ill Patients	
Overall Intent: To diagnose and manage acute and chronic renal dysfunction in critically ill patients	
Milestones	Examples
Level 1 <i>Recognizes and categorizes patients with renal disorders</i>	<ul style="list-style-type: none"> • Initiates fluids for a hypovolemic patient with acute kidney injury and determines response and ongoing fluid needs
Level 2 <i>Initiates treatment of renal disorders based on stage and etiology</i>	<ul style="list-style-type: none"> • Recognizes the difference in treatment of a patient with prerenal azotemia from hypovolemia versus fluid overload and initiates appropriate treatment • Understands the indications for renal replacement therapy and makes a daily determination for a patient's acute renal replacement needs
Level 3 <i>Directs management and assesses response to treatment</i>	<ul style="list-style-type: none"> • Identifies patients with acute and chronic kidney disease and understands the classification (e.g., Kidney Disease: Improving Global Outcomes (KDIGO); Risk of renal injury, Injury to the kidney, Failure of kidney function, Loss of kidney function, End stage disease (RIFLE); Acute Kidney Injury Network (AKIN)); and management of each
Level 4 <i>Provides comprehensive management of patients with renal disorders, including management of patients requiring renal replacement therapy</i>	<ul style="list-style-type: none"> • Initiates renal replacement therapy in conjunction with nephrology consultant
Level 5 <i>Recognized by peers as a resource, completes quality improvement or research project regarding management of patients with renal disorders</i>	<ul style="list-style-type: none"> • Performs quality improvement project for the proper initiation and management of continuous renal replacement therapy in the ICU
Assessment Models or Tools	<ul style="list-style-type: none"> • Direct observation • Evaluation of residents • Simulation
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Heung M, Yessayan L. Renal replacement therapy in acute kidney injury: Controversies and consensus. <i>Crit Care Clin.</i> 2017;33(2):365-378. https://www.criticalcare.theclinics.com/article/S0749-0704(16)30115-4/fulltext. 2021. • Khwaja A. KDIGO clinical practice guidelines for acute kidney injury. <i>Nephron Clin Pract.</i> 2012;120(4):c179-284. https://www.karger.com/Article/FullText/339789. 2021. • Koeze J, Keus F, Dieperink W, van der Horst IC, Zijlstra JG, van Meurs M. Incidence, timing and outcome of AKI in critically-ill patients varies with the definition used and the addition of urine output criteria. <i>BMC Nephrol.</i> 2017;18(1):70. https://www.karger.com/Article/FullText/339789. 2021.

Patient Care 5: Trauma and Thermal Injury	
Overall Intent: To evaluate and manage critically injured patients and those with thermal injuries	
Milestones	Examples
Level 1 <i>With direct supervision, initiates appropriate management of the critically injured patient</i>	<ul style="list-style-type: none"> • Requires supervision in assessment and initial management of critically injured patients
Level 2 <i>With indirect supervision, assesses critically injured patients and prioritizes and initiates management</i>	<ul style="list-style-type: none"> • Initiates the acute management of critically injured patients but receives feedback and validation of plans from faculty members
Level 3 <i>Independently assesses and manages critically injured patients and prioritizes management in the treatment of common injuries and complications</i>	<ul style="list-style-type: none"> • Leads a trauma resuscitation independently and manages typical operative intervention for a stab wound to the right colon • Leads a burn resuscitation independently and manages mechanical ventilation for a patient with smoke inhalation
Level 4 <i>Independently assesses and manages critically injured patients, including treatment of complex injuries and complications through initial evaluation and into the operating room/intensive care unit (ICU)</i>	<ul style="list-style-type: none"> • Manages complex injuries in a blunt polytrauma patient with competing interests (traumatic brain injury, orthopaedic fractures, abdominal injuries) • Manages a patient with thermal and traumatic injuries
Level 5 <i>Is recognized as a resource in the assessment and management of critically injured patients or completes a quality improvement or research project regarding management of critically injured patients</i>	<ul style="list-style-type: none"> • Recognized by more junior residents for education in trauma management and care of critically injured patients • Develops guidelines for intracranial pressure management in the ICU
Assessment Models or Tools	<ul style="list-style-type: none"> • Consultant feedback • Direct evaluation • Resident feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • American Burn Association. <i>Advanced Burn Life Support (ABLS) Provider Manual 2018 Update</i>. Chicago, IL: American Burn Association; 2018. http://ameriburn.org/wp-content/uploads/2019/08/2018-abls-providermanual.pdf. 2021. • American College of Surgeons Committee on Trauma. <i>Advanced Trauma Life Support (ATLS) Student Course Manual</i>. 10th ed. Chicago, IL: American College of Surgeons; 2018. https://viaaerearcp.files.wordpress.com/2018/02/atls-2018.pdf. 2021. • ISBI Practice Guidelines Committee, Steering Subcommittee, Advisory Subcommittee. ISBI practice guidelines for burn care. <i>Burns</i>. 2016;42(5):953-1021.

	<p>https://www.sciencedirect.com/science/article/pii/S0305417916301449?via%3Dihub. 2021.</p> <ul style="list-style-type: none">• ISBI Practice Guidelines Committee, Advisory Subcommittee, Steering Subcommittee. ISBI practice guidelines for burn care, part 2. <i>Burns</i>. 2018;44(7):1617-1706. <p>https://www.sciencedirect.com/science/article/abs/pii/S0305417918308143?via%3Dihub. 2021.</p>
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Patient Care 6: Cardiovascular Disorders of Critically Ill Patients	
Overall Intent: To diagnose and manage critically ill patients with cardiac disorders	
Milestones	Examples
Level 1 <i>Requires direct supervision in the assessment and initial management of common cardiovascular disorders in critically ill patients</i>	<ul style="list-style-type: none"> • Diagnoses acute myocardial infarction, dysrhythmias, heart failure but requires direct supervision for initial management in the ICU
Level 2 <i>Requires indirect supervision in the assessment and management of common cardiovascular disorders in critically ill patients</i>	<ul style="list-style-type: none"> • Initiates treatment and management of dysrhythmias with feedback and validation of plans by faculty members and/or consultants
Level 3 <i>Independently performs assessment and manages common cardiovascular disorders in critically ill patients</i>	<ul style="list-style-type: none"> • Evaluates and manages a patient with hypertensive crisis
Level 4 <i>Independently diagnoses and provides comprehensive management of complex cardiovascular disorders in critically ill patients</i>	<ul style="list-style-type: none"> • Appropriately assesses fluid status in a patient with heart failure and evaluates need for diuresis or inotropes • Independently initiates treatment and management of dysrhythmias
Level 5 <i>Is recognized as a resource or completes a quality improvement or research project regarding management of critically ill patients with cardiovascular disorders</i>	<ul style="list-style-type: none"> • Leads a quality improvement initiative within the ICU to develop guidelines for the use of pulmonary artery catheters and trains house staff and nursing
Assessment Models or Tools	<ul style="list-style-type: none"> • Intraprofessional team feedback • Consultant feedback • Direct supervision • Resident feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • January CT, Wann LS, Alpert JS, et al. 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: A report of the American College of Cardiology/American Heart Association Task Force on practice guidelines and the Heart Rhythm Society. <i>J Am Coll Cardiol</i>. 2014;64(21):e1–e76. https://www.jacc.org/doi/full/10.1016/j.jacc.2014.03.022. 2021. • January CT, Wann LS, Caulkins H, et al. 2019 AHA/ACC/HRS Focused Update of the 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on practice guidelines and the Heart Rhythm Society. <i>J Am Coll Cardiol</i>. 2019;74(1):104–132. https://www.ahajournals.org/doi/pdf/10.1161/CIR.0000000000000665. 2021.

Patient Care 7: Neurologic Disorders of Critically Ill Patients Overall Intent: To diagnose and manage critically ill patients with neurologic dysfunction	
Milestones	Examples
Level 1 <i>Requires direct supervision to recognize the stages and treatment of coma, delirium, seizures, and other neurologic disorders</i>	<ul style="list-style-type: none"> • Needs direction for the work-up and management of delirium in critically ill patients • Needs close oversight for the work-up and management of the patient with traumatic brain injury
Level 2 <i>Requires indirect supervision to assess and treat patients with coma, delirium, seizures, and other neurologic disorders</i>	<ul style="list-style-type: none"> • Assesses and manages patients with coma • Evaluates and manages patient with traumatic brain injury
Level 3 <i>Independently recognizes and manages multiple etiologies of coma, delirium, and other neurologic disorders</i>	<ul style="list-style-type: none"> • Initiates an appropriate regimen to decrease the risk of delirium • Initiates management for elevated intracranial pressure in patient with traumatic brain injury
Level 4 <i>Provides comprehensive management of multiple etiologies of coma, delirium, seizures, and other neurologic disorders</i>	<ul style="list-style-type: none"> • Educates ancillary staff and patient’s family regarding the concerns for delirium as part of a multidisciplinary approach to management • Demonstrates understanding of devastating brain injury and evaluation for brain death
Level 5 <i>Is recognized as a resource or completes a quality improvement or research project regarding management of patients with coma, delirium, seizures, and other neurologic disorders</i>	<ul style="list-style-type: none"> • Leads a quality improvement initiative to develop guidelines for prevention and treatment of delirium in the ICU
Assessment Models or Tools	<ul style="list-style-type: none"> • Intraprofessional team feedback • Consultant feedback • Direct supervision • Resident feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Brain Trauma Foundation. Guidelines for the Management of Severe TBI, 4th ed. https://braintrauma.org/guidelines/guidelines-for-the-management-of-severe-tbi-4th-ed/. 2021. • Como JJ, Diaz JJ, Dunham CM, et al. Practice management guidelines for identification of cervical spine injuries following trauma: Update from the Eastern Association for the Surgery of Trauma Practice Management Guidelines Committee. <i>J Trauma</i>. 2009;67(3):651-659. https://www.east.org/Content/documents/practicemanagementguidelines/EAST%20PMG_cervical%20spine_2009.pdf. 2021.

- Devlin JW, Skrobik Y, Gélinas C, et al. Clinical practice guidelines for the prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption in adult patients in the ICU. *Crit Care Med.* 2018;46(9):e825-e873.
https://journals.lww.com/ccmjournal/Fulltext/2018/09000/Clinical_Practice_Guidelines_for_the_Prevention.29.aspx. 2021.
- Kim DY, Biffi W, Bokhari F, et al. Evaluation and management of blunt cerebrovascular injury: A practice management guideline from the Eastern Association for the Surgery of Trauma. *J Trauma Acute Care Surg.* 2020;88(6):875-887.
https://www.east.org/Content/documents/practicemanagementguidelines/evaluation_and_management_of_blunt_cerebrovascular_injury.pdf. 2021.

Patient Care 8: Gastrointestinal Disorders of Critically Ill Patients Overall Intent: To prevent, diagnose, and manage gastrointestinal disorders in critically ill patients	
Milestones	Examples
Level 1 <i>Requires direct supervision to diagnose and manage acute GI disorders</i>	<ul style="list-style-type: none"> Needs direction for the work-up and management of patient with gastrointestinal bleeding
Level 2 <i>Requires indirect supervision to diagnose and manage acute GI disorders</i>	<ul style="list-style-type: none"> Initiates treatment for gastrointestinal bleeding seen in critically ill patients
Level 3 <i>Independently diagnoses and manages acute GI disorders</i>	<ul style="list-style-type: none"> Works collaboratively with gastroenterology to manage gastrointestinal bleeding in a patient with cirrhosis Determines appropriate intervention in a patient with gastrointestinal bleeding and cirrhosis
Level 4 <i>Provides comprehensive management of acute GI disorders</i>	<ul style="list-style-type: none"> Manages patients with acute hepatic failure
Level 5 <i>Is recognized as a resource or completes a quality improvement or research project regarding management of patients with acute GI disorders</i>	<ul style="list-style-type: none"> Directs residents in the management of a patient with acute hepatic failure
Assessment Models or Tools	<ul style="list-style-type: none"> Intraprofessional team feedback Consultant feedback Direct supervision Resident feedback
Curriculum Mapping	<ul style="list-style-type: none">
Notes or Resources	<ul style="list-style-type: none"> Nanchal R, Subramanian R, Karvellas CJ, et al. Guidelines for the management of adult acute and acute-on-chronic liver failure in the ICU: Cardiovascular, endocrine, hematologic, pulmonary and renal considerations: Executive summary. <i>Crit Care Med.</i> 2020;48(3):415-419. https://journals.lww.com/ccmjournals/Fulltext/2020/03000/Guidelines_for_the_Management_of_Adult_Acute_and.17.aspx. 2021. Otani S, Coopersmith CM. Gut integrity in critical illness. <i>J Intensive Care.</i> 2019;7(1):17. https://jintensivecare.biomedcentral.com/articles/10.1186/s40560-019-0372-6. 2021. Ye Z, Reintam Blaser A, Lytvyn L, et al. Gastrointestinal bleeding prophylaxis for critically ill patients: A clinical practice guideline. <i>BMJ.</i> 2020;368:l6722. https://www.bmj.com/content/368/bmj.l6722. 2021.

Patient Care 9: Infectious Diseases of Critically Ill Surgical Patients	
Overall Intent: To prevent, diagnose, and manage infections and infectious complications in critically ill patients	
Milestones	Examples
Level 1 <i>Requires direct supervision to diagnose common infections and infectious complications (e.g. pneumonia, bacteremia)</i>	<ul style="list-style-type: none"> • Needs direction for antibiotic selection for a patient with suspected pneumonia
Level 2 <i>Demonstrates the ability to diagnose and initiate management for frequently encountered infectious diseases and infectious complications</i>	<ul style="list-style-type: none"> • Initiates appropriate testing/work-up in patients with concerns for infection • Initiate antibiotics for a presumed pneumonia in an appropriate timeframe • Understands the necessity and role of source control
Level 3 <i>Diagnoses and manages atypical infectious diseases and infectious complications and demonstrates appropriate antimicrobial stewardship</i>	<ul style="list-style-type: none"> • Tailors antibiotic therapy based on culture results, local antibiograms, and patient condition • Demonstrates knowledge of potential complications of indiscriminate antibiotic use including recognition of multi-drug resistant organism • Diagnoses and manages a patient with fungemia
Level 4 <i>Provides comprehensive management (prevention, diagnosis, and treatment) of infectious diseases, infectious complications, and multi-drug resistant organisms</i>	<ul style="list-style-type: none"> • Demonstrates ability to manage immunocompromised critically ill patients and understands potential issues with management of this cohort • Demonstrates understanding and ability to recognize and manage patients with multi-drug resistant organism
Level 5 <i>Is recognized by peers as a resource or completes quality improvement or research project regarding management of an infectious complication</i>	<ul style="list-style-type: none"> • Promotes antibiotic stewardship program in the ICU • Leads a quality improvement project in the ICU on the management of the most common ICU infections
Assessment Models or Tools	<ul style="list-style-type: none"> • Intraprofessional team feedback • Consultant feedback • Direct supervision • Resident feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Pickens CI, Wunderink RG. Principles and practice of antibiotic stewardship in the ICU. <i>Chest</i>. 2019;156(1):163-171. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7118241/. 2021. • Sartelli M, Kluger Y, Ansaloni L, et al. Knowledge, awareness, and attitude towards infection prevention and management among surgeons: Identifying the surgeon champion. <i>World J Emerg Surg</i>. 2018;13:37. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6098571/. 2021.

- Surgical Critical Care. Empiric Antibiotic Use in Critically-Ill Patients. http://www.surgicalcriticalcare.net/Guidelines/empiric_antibiotics.pdf, 2021.

Patient Care 10: Procedural Competence	
Overall Intent: To demonstrate progressive knowledge and technical performance of increasingly complex procedures in critically ill patients	
Milestones	Examples
Level 1 Requires direct supervision to perform common ICU procedures (e.g., peripheral arterial or central venous catheterization) and recognize complications	<ul style="list-style-type: none"> Performs central venous catheterization with guidance and correctly obtains and interprets post-procedure chest radiograph
Level 2 Independently performs routine ICU procedures <i>Recognizes and manages straightforward procedural complications</i>	<ul style="list-style-type: none"> Performs central venous catheterization without guidance in a coagulopathic patient Manages a pneumothorax with chest tube insertion as a complication of central venous catheter insertion
Level 3 Performs routine ICU procedures in patients at high risk for procedural complications <i>Assesses patients at high risk for procedural complications and describes management</i>	<ul style="list-style-type: none"> Performs placement of fiberoptic bronchoscopy device and adjusts based on failure to capture and correct arrhythmia Performs cardiac echo for volume assessment Places a PA catheter Performs venous cannulation for initiation of urgent renal replacement therapy
Level 4 Performs specialized ICU procedures (e.g., transvenous pacing, inferior vena cava filter placement) <i>Independently manages procedural complications</i>	<ul style="list-style-type: none"> Places a resuscitative endovascular balloon occlusion of the aorta catheter and appropriately manages the resulting reperfusion injury Performs emergency endoscopy for bleeding
Level 5 Independently performs advanced ICU procedures (e.g., ECMO, intra-aortic balloon pump), and appropriately manages their complications	<ul style="list-style-type: none"> Independently cannulates a patient for venovenous extracorporeal membrane oxygenation and manages initial support
Assessment Models or Tools	<ul style="list-style-type: none"> Direct observation Resident feedback Support staff member feedback
Curriculum Mapping	<ul style="list-style-type: none">
Notes or Resources	<ul style="list-style-type: none"> Keller JM, Steinbach TC, Adamson R, et al. ICU emergencies simulation curriculum for critical care fellows: The difficult airway. <i>MedEdPORTAL</i>. 2018;14:10744. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6346282/. 2021.

- Kelm DJ, Ridgeway JL, Ratelle JT, et al. Characteristics of effective teachers of invasive bedside procedures: A multi-institutional qualitative study. *Chest*. 2020;158(5):2047-2057. [https://journal.chestnet.org/article/S0012-3692\(20\)31411-2/fulltext](https://journal.chestnet.org/article/S0012-3692(20)31411-2/fulltext). 2021.
- Procedural competence includes the following:
 - airway management (e.g., bag valve mask, supraglottic airways, intubation, surgical airway)
 - bronchoscopy
 - catheter placement (e.g., arterial, central venous, dialysis access, pulmonary artery)
 - chest tubes and thoracentesis
 - complex wound care (e.g., fasciotomy, negative pressure therapy, burn wound care)
 - ultrasound evaluation and procedural guidance
- SCORE. Module Resources. https://www.surgicalcore.org/modules.aspx?f_specialties=General+Surgery&f_competency=Patient+Care. 2021.
- SCORE. Module Resources. https://www.surgicalcore.org/modules.aspx?f_specialties=Surgical+Critical+Care+-+Fellowship+Level&f_moduletype=Operation%2fProcedure. 2021.

Medical Knowledge 1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care Overall Intent: To demonstrate progressive knowledge of pathophysiology and treatment of critical care conditions occurring in surgical patients	
Milestones	Examples
<p>Level 1 <i>Demonstrates knowledge of pathophysiology, pharmacology, therapeutics, and complications of common critical care conditions</i></p> <p><i>Synthesizes and prioritizes differential diagnosis for common critical care conditions, with indirect supervision</i></p>	<ul style="list-style-type: none"> • Demonstrates knowledge of pathophysiology and treatment of patients with sepsis
<p>Level 2 <i>Demonstrates knowledge of pathophysiology, pharmacology, therapeutics, and complications of complex critical care conditions</i></p> <p><i>Synthesizes and prioritizes differential diagnosis for common critical care conditions</i></p>	<ul style="list-style-type: none"> • Demonstrates knowledge of pathophysiology and treatment of patients with acute respiratory distress syndrome • Demonstrates knowledge of the impact of the following patient factors on the pathophysiology and treatment of surgical conditions: <ul style="list-style-type: none"> ○ chronic anticoagulation ○ congestive heart failure ○ diabetes ○ liver failure ○ renal failure
<p>Level 3 <i>Synthesizes and applies knowledge of pathophysiology, pharmacology, therapeutics, and complications of complex critical care conditions</i></p> <p><i>Independently synthesizes and prioritizes differential diagnosis for complex critical care conditions</i></p>	<ul style="list-style-type: none"> • Demonstrates knowledge of pathophysiology and treatment of patients with abdominal compartment syndrome • Understands the comprehensive management of the patient with ARDS
<p>Level 4 <i>Serves as a resource for knowledge of pathophysiology, pharmacology, therapeutics, and complications of complex critical care conditions</i></p> <p><i>Synthesizes and prioritizes differential diagnosis and anticipates potential complications for complex critical care conditions</i></p>	<ul style="list-style-type: none"> • Teaches residents pathophysiology and treatment of patients with multi-system organ failure • Synthesizes knowledge of pathophysiology and treatment to patients with multi-system organ failure who have significant underlying conditions such as congestive heart failure, chronic renal failure, or hepatic disease

	<ul style="list-style-type: none"> Utilizes knowledge of disease process and therapeutics to care for and direct the management of the patient with sepsis-related multi-system organ dysfunction who has COPD and ESRD
<p>Level 5 <i>Advances knowledge of pathophysiology, pharmacology, therapeutics, and complications of complex critical care conditions</i></p> <p><i>Is recognized by peers as an expert in synthesizing and prioritizing differential diagnosis complex critical care conditions and anticipating potential complications</i></p>	<ul style="list-style-type: none"> Publishes institutional experience with abdominal compartment syndrome Designs clinical trial Contributes patients to clinical trials Develops an institutional guideline for management of abdominal compartment syndrome
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> Direct observation End-of-rotation evaluation Morbidity and mortality (M and M) conference
<p>Curriculum Mapping</p>	<ul style="list-style-type: none">
<p>Notes or Resources</p>	<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. 2021. Fink MP, Vincent JL, Moore FA. <i>Textbook of Critical Care.</i> 7th ed. Philadelphia, PA: Elsevier; 2017. ISBN:978-0323376389. Michetti CP, Fakhry SM, Brasel K, Martin ND, Teicher EJ, Liu C, Newcomb A, TRIPP Study Group. Structure and function of a trauma intensive care unit: A report from the Trauma Intensive Care Unit Prevalence Project. <i>J Trauma Acute Care Surg.</i> 2019;86(5):783-790. https://jhu.pure.elsevier.com/en/publications/structure-and-function-of-a-trauma-intensive-care-unit-a-report-f. 2021. SCORE. Module Resources. https://www.surgicalcore.org/modules.aspx?f_specialties=Surgical+Critical+Care+-+Fellowship+Level. 2021.

Medical Knowledge 2: Prognosis in Critical Care Conditions	
Overall Intent: To use clinical, laboratory, and radiologic data along with knowledge of current literature to develop appropriate prognoses for critically ill patients, allowing for appropriate treatment, goals of care, and communication	
Milestones	Examples
Level 1 <i>Recognizes clinical course, including prognosis, of common critical care conditions</i>	<ul style="list-style-type: none"> Recognizes the application of scoring systems for outcomes of a patient with traumatic brain injury Discusses probability of survival, and potential outcomes, in a patient with moderate traumatic brain injury and communicates that information to the team
Level 2 <i>Identifies clinical course for patients with complex critical care conditions, including prognostic uncertainty</i>	<ul style="list-style-type: none"> Recognizes the increased risk of mortality for a patient with severe traumatic brain injury and discusses the uncertainty of outcomes with patient's family members
Level 3 <i>Formulates anticipated clinical course for patients with complex critical care conditions by integrating prognostic factors, tools, and models</i>	<ul style="list-style-type: none"> Uses a recognized tool to help the clinical team evaluate the patient's chance of survival with multi-organ system failure Facilitates discussion and institution of palliative care plan
Level 4 <i>Facilitates consensus of prognosis for patients with complex critical care conditions in collaboration with other care providers</i>	<ul style="list-style-type: none"> Uses clinical data and published literature to help a multidisciplinary team formulate a clinical care plan for a comatose patient with traumatic brain injury and respiratory and renal failure
Level 5 <i>Advances knowledge of application of tools for prognostication in complex critical care conditions</i>	<ul style="list-style-type: none"> Publishes a review article on the prognosis of patients with severe traumatic brain injury
Assessment Models or Tools	<ul style="list-style-type: none"> Direct observation End-of-rotation evaluation
Curriculum Mapping	<ul style="list-style-type: none">
Notes or Resources	<ul style="list-style-type: none"> American College of Surgeons. <i>Surgical Palliative Care: A Residents Guide</i>. Chicago, IL: American College of Surgeons; 2009. https://www.facs.org/~media/files/education/palliativecare/surgicalpalliativecareresidents.ashx. 2021. Goettler CE, Waibel BH, Goodwin J, et al. Trauma intensive care unit survival: How good is an educated guess? <i>J Trauma</i>. 2010;68(6):1279-87. https://pubmed.ncbi.nlm.nih.gov/20539170/. 2021. Raith EP, Udy AA, Bailey M, et al. Prognostic accuracy of the SOFA Score, SIRS Criteria, and qSOFA Score for in-hospital mortality among adults with suspected infection admitted to the intensive care unit. <i>JAMA</i>. 2017;317(3):290-300. https://jamanetwork.com/journals/jama/fullarticle/2598267. 2021.

- Raj R, Skrifvars M, Bendel S, et al. Predicting six-month mortality of patients with traumatic brain injury: Usefulness of common intensive care severity scores. *Crit Care*. 2014;18(2):R60. <https://ccforum.biomedcentral.com/articles/10.1186/cc13814>. 2021.

Medical Knowledge 3: Clinical Reasoning in Critical Care	
Overall Intent: To engage in the collection, analysis, and interpretation of clinical information to develop and implement treatment, while also recognizing and correcting errors in thought processes	
Milestones	Examples
Level 1 <i>Demonstrates sound clinical reasoning in common critical care problems</i>	<ul style="list-style-type: none"> Establishes treatment priorities in the management of critically ill patients Prioritizes common to rare diagnoses in critical care patients
Level 2 <i>Identifies errors in clinical reasoning within critical care</i>	<ul style="list-style-type: none"> Changes an emergency room diagnosis of sepsis to massive pulmonary embolus by reviewing clinical evidence and correcting bias errors associated with the incorrect diagnosis
Level 3 <i>Applies clinical reasoning principles to direct patient care in complex critical care problems</i>	<ul style="list-style-type: none"> Reassesses a patient with persistent shock on appropriate antibiotics and considers adrenal insufficiency when the patient is not responding to therapy
Level 4 <i>Reviews the clinical decision-making of oneself and the team to identify areas for improvement</i>	<ul style="list-style-type: none"> During a team discussion of a trauma patient with cardiogenic shock presenting with low urine output, recognizes that the team anchored on the diagnosis of hypovolemia by the overnight resident
Level 5 <i>Coaches and mentors others in clinical reasoning and helps them to recognize and avoid cognitive errors</i>	<ul style="list-style-type: none"> Includes common clinical reasoning errors and tools to avoid when presenting a lecture on the diagnosis and management of shock
Assessment Models or Tools	<ul style="list-style-type: none"> Direct supervision Feedback of residents and intraprofessional team
Curriculum Mapping	<ul style="list-style-type: none">
Notes or Resources	<ul style="list-style-type: none"> Hayes MM, Chatterjee S, Schwartzstein RM. Critical thinking in critical care: Five strategies to improve teaching and learning in the intensive care unit. <i>Ann Am Thorac Soc.</i> 2017;14(4):569-575. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5461985/. 2021. Kaur AP, Levinson AT, Monteiro JFG, Carino GP. The impact of errors on healthcare professionals in the critical care setting. <i>J Crit Care.</i> 2019;52:16-21. https://www.sciencedirect.com/science/article/abs/pii/S0883944118313066. 2021. Royce CS, Hayes MM, Schwartzstein RM. Teaching critical thinking: A case for instruction in cognitive biases to reduce diagnostic errors and improve patient safety. <i>Acad Med.</i> 2019;94(2):187-194. https://journals.lww.com/academicmedicine/Fulltext/2019/02000/Teaching_Critical_Thinking_A_Case_for_Instruction.20.aspx. 2021. SCORE. Module Content. https://www.surgicalcore.org/modulecontent.aspx?id=1000754. 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, as well as conducting a QI project	
Milestones	Examples
<p>Level 1 <i>Demonstrates knowledge of common patient safety events</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"> • Knows that a near miss is a patient safety event • Knows how to report a near miss • Identifies a root cause analysis as a method for QI
<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 local quality improvement initiatives (e.g., infection rate, hand hygiene, opioid use)</i></p>	<ul style="list-style-type: none"> • Identifies difference between individual and system factors in safety events • Reports a medication administration error • Describes Centers for Medicare and Medicaid Services (CMS) patient safety indicators as a QI marker for their program
<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 their families (simulated or actual)</i></p> <p><i>Participates in local quality improvement initiatives</i></p>	<ul style="list-style-type: none"> • Prepares for M and M presentations • Has participated in discussions with patients and/or families about a medication administration error • Participates in a root cause analysis group
<p>Level 4 <i>Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)</i></p> <p><i>Discloses patient safety events to patients and their families (simulated or actual)</i></p>	<ul style="list-style-type: none"> • Collaborates with a team to lead the analysis of a medication administration error • Leads communications with patients/families about a medication administration error events in a simulated situation

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<p><i>Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project</i></p>	<ul style="list-style-type: none"> • Has initiated and completed a QI project using the CMS patient safety indicators, including communication with stakeholders
<p>Level 5 <i>Actively engages teams and processes to modify systems to prevent patient safety events</i></p> <p><i>Mentors others in the disclosure of patient safety events</i></p> <p><i>Creates, implements, and assesses quality improvement initiatives at the institutional or community level</i></p>	<ul style="list-style-type: none"> • Leads process to reduce medication administration errors • Creates an error disclosure simulation for residents • Leads a multidisciplinary team focused on fall prevention
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Direct observation • E-learning module with assessment • Medical record (chart) audit • M and M conference • Portfolio • Reflection • Simulation
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> •
<p>Notes or Resources</p>	<ul style="list-style-type: none"> • ACS. Quality In-Training Initiative (QITI). https://qiti.acsnsqip.org/qiti/. 2021. • Institute of Healthcare Improvement. http://www.ihp.org/Pages/default.aspx. 2021.

Systems-Based Practice 2: System Navigation for Patient-Centered Care	
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, particularly in critically ill patients	
Milestones	Examples
<p>Level 1 <i>Demonstrates knowledge of indications and resources for care coordination</i></p> <p><i>Performs safe and effective transitions of care/hand-offs in routine clinical situations</i></p>	<ul style="list-style-type: none"> • Identifies the members of the interprofessional team and describes their roles • Performs an effective hand-off of care of an intubated patient
<p>Level 2 <i>Coordinates multidisciplinary care of patients in routine critical care situations</i></p> <p><i>Performs safe and effective transitions of care/hand-offs in complex clinical situations</i></p>	<ul style="list-style-type: none"> • Contacts interprofessional team members, such as social workers and consultants • Performs an effective hand-off of a patient in septic shock
<p>Level 3 <i>Coordinates and/or leads multidisciplinary care of patients in complex critical care situations</i></p> <p><i>Supervises safe and effective transitions of care/hand-offs of junior residents</i></p>	<ul style="list-style-type: none"> • For the critically ill patient, the fellow coordinates a multidisciplinary team and prioritizes peri-operative management • Supervises the team in transition of care and hand-offs of care during trauma and emergency surgery
<p>Level 4 <i>Coordinates care of patients with barriers to health care access or other disparities in care</i></p> <p><i>Resolves conflicts in transitions of care between teams</i></p>	<ul style="list-style-type: none"> • Directs post-hospital care of homeless person with complex surgical illness such as perforated viscus with post-ICU syndrome • Provides efficient hand-off of care from the ICU to a rehabilitation center • Resolves conflicts between teams for operative prioritization in a patient with multiple injuries
<p>Level 5 <i>Leads the design and implementation of improvements to care coordination</i></p> <p><i>Leads in the design and implementation of improvements to transitions of care</i></p>	<ul style="list-style-type: none"> • Takes a leadership role in designing and implementing changes to improve the care coordination process • Creates innovative hand-off of care tools
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Direct observation • Multisource feedback • Review of hand-off checklists between units
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> •
<p>Notes or Resources</p>	<ul style="list-style-type: none"> • Agency for Healthcare Research and Quality. https://www.ahrq.gov/. 2021.

- Team STEPS/I PASS

Systems-Based Practice 3: Community and Population Health	
Overall Intent: To adapt care to a specific patient population to ensure high-quality patient outcomes, with emphasis on the ICU environment	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of population and community health needs and disparities</i>	<ul style="list-style-type: none"> Identifies that patients in different socioeconomic circumstances may have different abilities to access health care once discharged from the ICU Identifies that patients in different socioeconomic circumstances may have different comorbidities due to a lack of access to health care
Level 2 <i>Identifies specific population and community health needs and inequities for the local population</i>	<ul style="list-style-type: none"> Identifies that geographic remoteness may be a factor in how patients receive health care Identifies that patients in urban neighborhoods have an increased risk for penetrating trauma Identifies socioeconomic status as a risk for specific types of injuries or illness
Level 3 <i>Uses local resources effectively to meet the needs of a patient population and community</i>	<ul style="list-style-type: none"> Identifies and understands local resources available for discharge and support of patient without defined housing Identifies socioeconomic factors impacting patient's ability to access rehabilitation services and/or follow-up and potential alternatives
Level 4 <i>Participates in changing and adapting practice to provide for the needs of specific populations</i>	<ul style="list-style-type: none"> Assists in designing outreach program for post-discharge recovery Assists to design protocols for procedural sedation in patients with opioid use disorders
Level 5 <i>Leads innovations and advocates for populations and communities with health care inequities</i>	<ul style="list-style-type: none"> Leads development of a project to enable greater access to in-person interpreters in the hospital
Assessment Models or Tools	<ul style="list-style-type: none"> Checklists Direct observation Medical record (chart) audit Multisource feedback
Curriculum Mapping	<ul style="list-style-type: none">
Notes or Resources	<ul style="list-style-type: none"> CDC. Population Health Training in Place Program (PH-TIPP) https://www.cdc.gov/pophealthtraining/whatis.html. 2021. Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan J, Gonzalo JD. <i>Health Systems Science</i>. 1st ed. Philadelphia, PA: Elsevier; 2016. ISBN:9780702070372. TissuePathology. In Pursuit of Patient-Centered Care. https://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns. 2021.

Systems-Based Practice 4: Physician Role in Health Care Systems	
Overall Intent: To understand the surgeon’s role in the complex health care system, and how to optimize the system to improve patient care and the health system’s performance, with particular emphasis on the ICU environment	
Milestones	Examples
<p>Level 1 <i>Describes basic health payment systems, including government, private, public, and uninsured care, as well as different practice models</i></p> <p><i>Describes and identifies administrative roles in a surgical critical care unit</i></p>	<ul style="list-style-type: none"> • Describes payment systems, such as Medicare, Medicaid, the Veterans Affairs (VA), and commercial third-party payors • Understands the leadership structure of the ICU in relationship to the hospital environment
<p>Level 2 <i>Describes how working within the health care system impacts patient care</i></p> <p><i>Identifies the key components and responsibilities of an ICU director for administration for a surgical critical care unit</i></p>	<ul style="list-style-type: none"> • Understands how improving patient satisfaction improves patient compliance • Applies knowledge of health plan features, including formularies and network requirements, in patient care situations • Identifies interdisciplinary teamwork, establishment of policies and procedures for the unit, conflict resolution, coordination of resources and service line evaluation, integration with other disciplines/service lines within the institution
<p>Level 3 <i>Analyzes how personal practice affects the system</i></p> <p><i>Demonstrates knowledge of administrative leadership activities for the surgical critical care unit</i></p>	<ul style="list-style-type: none"> • Understands, accesses, and analyzes their own individual performance data; relevant data may include: <ul style="list-style-type: none"> ○ incidence of hospital acquired infections, in patients on the trauma service, compared to benchmarks ○ patient satisfaction data ○ percentage of intubated patients the fellow managed who had an appropriate “ventilator bundle” implemented • Understands how the ICU medical director and nurse manager collaborate to improve patient care
<p>Level 4 <i>Uses shared decision making in patient care, taking into consideration patient risks and benefits</i></p> <p><i>Participates in key activities of administrative leadership for surgical critical care unit</i></p>	<ul style="list-style-type: none"> • Leads discussion with patients/family regarding goals of care at the end of life • Joins a unit based clinical leadership committee

<p>Level 5 <i>Advocates or leads change to enhance systems for high-value, efficient, and effective patient care</i></p> <p><i>Demonstrates proficiency in administrative leadership, including knowledge of regulatory requirements</i></p>	<ul style="list-style-type: none"> • Develops an order set to reduce unneeded laboratory tests • Uses established national guidelines to reduce order duplication and unnecessary lab testing and imaging to enhance trajectory of patient care • Participates with institutional recertification processes
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Direct observation • Medical record (chart) audit • Multiple choice test • Multisource feedback • Quality Improvement project
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> •
<p>Notes or Resources</p>	<ul style="list-style-type: none"> • Agency for Healthcare Research and Quality. Measuring the Quality of Physician Care. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/challenges.html. 2021. • Agency for Healthcare Research and Quality. Major Physician Measurement Sets. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/measurementsets.html. 2021. • The Commonwealth Fund. Health System Data Center. https://datacenter.commonwealthfund.org/#ind=1/sc=1. 2021. • Dzau VJ, McClellan M, Burke S, et al. Vital directions for health and health care: priorities form a national academy of medicine initiative. <i>JAMA</i>. 2017;317(14):1461-1470. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. 2021. • The Kaiser Family Foundation. www.kff.org. 2021. • The Kaiser Family Foundation. Topic: Health Reform. http://kff.org/health-reform/. 2021. • The National Academy for Medicine. Vital Directions for Health and Health Care: A Policy Initiative of the National Academy for Medicine. https://nam.edu/initiatives/vital-directions-for-health-and-health-care/. 2021.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice	
Overall Intent: To evaluate and incorporate evidence, integrated with patient values, into clinical practice with emphasis on the ICU environment	
Milestones	Examples
Level 1 <i>Demonstrates how to access and use available evidence, and incorporate patient preferences and values into the care of critically ill patients</i>	<ul style="list-style-type: none"> • Performs a literature review on indications and benefits of high-flow nasal cannula to reduce the need for intubation and mechanical ventilation
Level 2 <i>Articulates clinical questions and uses scientific literature, guidelines, and algorithms integrated with patient preference to guide care of critically ill patients</i>	<ul style="list-style-type: none"> • A trauma patient who refuses blood products and the fellow performs a targeted literature review looking at outcomes for different treatment approaches • Performs a targeted literature review of different treatment approaches for management of the trauma patient who refuses blood products
Level 3 <i>Locates and applies the best available evidence, integrated with patient preference, to the care of critically ill patients with complex conditions</i>	<ul style="list-style-type: none"> • Performs a literature review and evaluates and implements published guidelines for transfusion threshold in critically ill patients
Level 4 <i>Critically appraises and applies evidence, even in the face of uncertain and/or conflicting evidence, to guide care of critically ill patients</i>	<ul style="list-style-type: none"> • Leads a journal club on the timing of renal replacement therapy during critical illness
Level 5 <i>Coaches others to critically appraise and apply evidence to the care of critically ill patients with complex conditions, and/or participates in the development of guidelines</i>	<ul style="list-style-type: none"> • Presents a review of available evidence to a hospital guidelines committee to advocate for the use of thromboelastogram in the management of trauma patients • Develops a guideline based on a series of research articles on the controversial topic of steroid use in acute respiratory distress syndrome
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"> • The ABIM Foundation. Choosing Wisely. http://www.choosingwisely.org/. 2021. • American College of Physicians. High Value Care. https://www.acponline.org/clinical-information/high-value-care. 2021. • Costs of Care. https://costsofcare.org/. 2021. • Dartmouth-Hitchcock. Center for Shared Decision Making. https://med.dartmouth-hitchcock.org/csdm_toolkits.html. 2021.

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth Overall Intent: To become a lifelong learner and incorporate learning, feedback, and outcomes into practice and develop clear objectives and goals for improvement in a personalized form of a learning plan	
Milestones	Examples
Level 1 Establishes goals for personal and professional development	<ul style="list-style-type: none"> • Identifies need to improve through self-reflection • Seeks ways to improve • Uses a self-assessment tool to identify opportunities for improvement
Level 2 Identifies opportunities for performance improvement; designs a learning plan	<ul style="list-style-type: none"> • Identifies low Multidisciplinary Critical Care Knowledge Assessment Program (MCCKAP) score below their expectation and creates a study plan • Uses simulation to improve endotracheal intubations
Level 3 Integrates performance feedback and practice data to develop and implement a learning plan	<ul style="list-style-type: none"> • Incorporates expert feedback to further improve intubations for difficult airways • Meets with a mentor in an ongoing basis to maintain preparation for American Board of Surgery Surgical Critical Care certifying examination
Level 4 Revises learning plan for personal growth based on performance data	<ul style="list-style-type: none"> • Seeks a new area for learning if previous plan is completed successfully, such as improving critical care echocardiography skills • Improves endotracheal intubation skills but continues to work on fiber optic skills after self-reflection and feedback
Level 5 Coaches others in the design and implementation of learning plans	<ul style="list-style-type: none"> • Independently identifies and coaches residents struggling with technical skills
Assessment Models or Tools	<ul style="list-style-type: none"> • Direct observation • Mentor/coach evaluation of learning plan • Multisource feedback
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: practice-based learning and improvement. <i>Academic Pediatrics</i>. 2014;14(2 Suppl):S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/pdf. 2021. • 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. 2021. • 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. 2021.

Professionalism 1: Ethical Principles	
Overall Intent: To recognize relevant ethical principles and apply them in practice, and use appropriate resources for managing ethical dilemmas	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of the ethical principles underlying informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics</i>	<ul style="list-style-type: none"> • Discusses the basic principles underlying ethics and professionalism, and how they apply in various situations • Identifies a surrogate decision maker for impaired patients
Level 2 <i>Analyzes straightforward situations using ethical principles</i>	<ul style="list-style-type: none"> • Teaches team members the basic principles of ethics, the elements of informed consent, and the importance of maintaining confidentiality in public spaces
Level 3 <i>Recognizes need to seek help in managing and resolving complex ethical situations</i>	<ul style="list-style-type: none"> • Obtains institutional guidance on obtaining consent for blood transfusion in pediatric Jehovah’s Witness patient • Analyzes difficult real or hypothetical ethics case scenarios or situations, recognizes own limitations
Level 4 <i>Independently recognizes and uses appropriate resources for managing and resolving ethical dilemmas as needed</i>	<ul style="list-style-type: none"> • Manages a near miss or sentinel event in a multidisciplinary fashion • Identifies and addresses the ethical dilemmas of performing procedures in patients with a do not resuscitate order • Recognizes and manages situations of medical futility • Resolves goals of care conflicts between family members
Level 5 <i>Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution</i>	<ul style="list-style-type: none"> • Identifies and seeks to address system-wide factors or barriers to promoting a culture of ethical behavior through participation in a root cause analysis review committee
Assessment Models or Tools	<ul style="list-style-type: none"> • Direct observation • Global evaluation • Multisource feedback • Simulation
Curriculum Mapping	<ul style="list-style-type: none"> •
Notes or Resources	<ul style="list-style-type: none"> • American Medical Association. Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. 2021. • American College of Surgeons. Code of Professional Conduct. https://www.facs.org/about-ac/s/statements/stonprin#code. 2021. • Ferreres AR, Angelos P, Singer EA. <i>Ethical Issues in Surgical Care</i>. American College of Surgeons. https://www.facs.org/Education/Division-of-Education/Publications/Ethical-Issues-in-Surgical-Care. 2021. • SCORE Modules

- Taylor LJ, Nabozny MJ, Steffens NM, et al. A framework to improve surgeon communication in high-stakes surgical decisions: Best case/worst case. *JAMA Surg.* 2017;152(6):531-538. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5479749/>. 2021.

Professionalism 2: Professional Behavior and Accountability	
Overall Intent: To take responsibility for one’s actions, and the impact of them on patients and other members of the health care team, and recognize the limits of one’s own knowledge and skill	
Milestones	Examples
<p>Level 1 <i>Describes when and how to appropriately report lapses in professional behavior</i></p> <p><i>Recognizes limits in one’s own knowledge/skills and seeks help</i></p>	<ul style="list-style-type: none"> • Knows how to report unprofessional behavior at the institution • Apologizes to team member(s) for unprofessional behavior without prompting • Asks for help to perform a procedure that is unfamiliar or uncomfortable
<p>Level 2 <i>Takes responsibility for one’s own professional behavior</i></p> <p><i>Recognizes limits in the team’s knowledge/skills and seeks help</i></p>	<ul style="list-style-type: none"> • Communicates expectations for professional behavior to other team members • Promotes graduated responsibility for team members based on their skill/knowledge base • Aids more junior residents struggling with performing procedures
<p>Level 3 <i>Demonstrates professional behavior in complex or stressful situations and reports lapses in professional behavior</i></p> <p><i>Exhibits appropriate confidence and self-awareness of limits in knowledge/skills</i></p>	<ul style="list-style-type: none"> • Asks for help after attempting a difficult procedure without success • Asks for help leading family meeting where withdrawal of life-sustaining treatment will be discussed
<p>Level 4 <i>Intervenes to prevent and correct lapses in professional behavior in oneself and others</i></p> <p><i>Aids junior learners in recognition of limits in knowledge/skills</i></p>	<ul style="list-style-type: none"> • Recognizes fatigue in team members and takes action to mitigate it • Intervenes to address unprofessional behavior in other team members • Reports harassment of students and residents to appropriate institutional official
<p>Level 5 <i>Coaches others when their behavior fails to meet professional expectations</i></p>	<ul style="list-style-type: none"> • Coaches others on how to avoid conflict with team members
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Compliance with deadlines and timelines • Direct observation • Multisource feedback • Simulation
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> •
<p>Notes or Resources</p>	<ul style="list-style-type: none"> • American College of Surgeons. Code of Professional Conduct. https://www.facs.org/about-accs/statements/stonprin#code. 2021. • Code of conduct from institutional manual

Professionalism 3: Self-Awareness and Help-Seeking Overall Intent: To identify, use, manage, improve, and seek help for personal and professional well-being for self and others	
Milestones	Examples
<p>Level 1 <i>Identifies the institutional resources available to manage personal, physical, and emotional health</i></p> <p><i>Demonstrates knowledge of the principles of physician well-being and fatigue mitigation</i></p>	<ul style="list-style-type: none"> • Completes institutional-learning module(s) related to fatigue management • Shows how to access an institutional crisis line • Requests time off for medical or dental appointment
<p>Level 2 <i>Monitors personal health and wellness and appropriately mitigates fatigue and/or stress</i></p> <p><i>Manages personal time and assures fitness for duty</i></p>	<ul style="list-style-type: none"> • Tracks work hours and adjusts schedule to comply with work hours and reduce fatigue • Has a regular wellness program
<p>Level 3 <i>Promotes healthy habits and creates an emotionally healthy environment for colleagues</i></p> <p><i>Models appropriate management of personal health issues, fatigue, and stress</i></p>	<ul style="list-style-type: none"> • Ensures more junior residents leave the hospital at an appropriate time • Pro-actively communicates with team and stays home when ill
<p>Level 4 <i>Recognizes and appropriately addresses signs and symptoms of burnout, depression, suicidal ideation, potential for violence, and/or substance abuse in other members of the health care team</i></p> <p><i>Proactively modifies schedules or intervenes in other ways to assure that those caregivers under one’s supervision maintain personal wellness and do not compromise patient safety</i></p>	<ul style="list-style-type: none"> • Brings concerns about other team members to the program director • Arranges for a resident to take a day off if the resident is fatigued and/or approaching clinical and educational work hour limits • Arranges resident schedules to ensure residents have appropriate time off such as one day off in seven
<p>Level 5 <i>Coaches others when emotional responses or limitations in knowledge/skills do not meet professional expectations</i></p>	<ul style="list-style-type: none"> • Leads a mindfulness or wellness program with residents and/or staff members • Organizes program activities to improve well-being
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Direct observation • Group interview or discussions for team activities • Individual interview

	<ul style="list-style-type: none"> • Institutional online training modules • Participation in institutional well-being programs • 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. Rather, the intent is to ensure that each fellow has the fundamental knowledge of factors that affect well-being, the mechanisms by which those factors affect well-being, and available resources and tools to improve well-being. • ACGME. “Well-Being Tools and Resources.” https://dl.acgme.org/pages/well-being-tools-resources. Accessed 2022. • Local resources, including Employee Assistance Programs • National Academy of Medicine. Clinician Resilience and Well-being. https://nam.edu/initiatives/clinician-resilience-and-well-being/. 2021.

Interpersonal and Communication Skills 1: Patient and Family-Centered Communication	
Overall Intent: To deliberately use language and behaviors to form a therapeutic relationship with a patient and his or her family; to use self-reflection to recognize and avoid personal biases in the doctor-patient relationship; and 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 their families</i></p>	<ul style="list-style-type: none"> • Self-monitors and controls tone, non-verbal responses, and language during patient interview • Asks questions to invite the patient’s participation • Accurately communicates their role to patients and families, and identifies common communication barriers (e.g., loss of hearing, language, aphasia) in patient and family encounters • Updates patients and patients’ families on changing conditions in a timely fashion • Provides patients with routine follow-up information (e.g., wrist x-ray obtained earlier in the day is normal, hematocrit is stable, etc.)
<p>Level 2 <i>Customizes communication, avoiding personal biases and communication barriers, with patients and families</i></p> <p><i>Actively listens to patients and their families to elicit preferences and expectations</i></p>	<ul style="list-style-type: none"> • Identifies complex communication barriers (e.g., culture, religious beliefs, health literacy) in patient and family encounters • Leads a discussion about acute pain management with the patient and the family, reassessing the patient’s and family’s understanding and anxiety
<p>Level 3 <i>Delivers complex and difficult information to patients and their families</i></p> <p><i>Uses shared decision making to make a personalized care plan</i></p>	<ul style="list-style-type: none"> • Coordinates the therapeutic relationship with a challenging patient (e.g., angry, non-compliant) • Acts to mitigate identified communication barriers, including reflection on implicit biases (e.g., preconceived ideas about patients of certain race or weight) • Acknowledges uncertainty in a patient’s medical complexity and prognosis • Independently engages in shared decision making with the patient and family members, including a recommended acute pain management plan to align a patient’s unique goals with treatment options
<p>Level 4 <i>Facilitates difficult discussions specific to patient and patient’s family needs</i></p> <p><i>Effectively negotiates and manages conflict among patients, their families, and the health care team</i></p>	<ul style="list-style-type: none"> • Facilitates family conference when family members disagree about the goals of care • Negotiates care management with all parties around medically ineffective therapies

<p>Level 5 <i>Coaches others in the facilitation of crucial conversations</i></p> <p><i>Coaches others in conflict resolution</i></p>	<ul style="list-style-type: none"> • Mentors/coaches and supports colleagues in self-awareness and reflection to promote communication • Creates a curriculum to teach conflict resolution in family conferences
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Direct observation • Kalamazoo Essential Elements Communication Checklist (Adapted) • Mini-clinical evaluation exercise • Multisource feedback • Self-assessment including self-reflection exercises • Standardized patients or structured case discussions
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> •
<p>Notes or Resources</p>	<ul style="list-style-type: none"> • American Academy of Hospice and Palliative Medicine. Hospice and Palliative Medicine Competencies Project. http://aahpm.org/fellowships/competencies#competencies-toolkit. 2021. • ACS. Communicating with Patients about Surgical Errors and Adverse Outcomes. https://web4.facs.org/ebusiness/ProductCatalog/product.aspx?ID=229. 2021. • ACS. Disclosing Surgical Error Vignettes. https://web4.facs.org/ebusiness/ProductCatalog/product.aspx?ID=157. 2021. • Baile WF, Buckman R, Lenzi R, et al. SPIKES - a six-step protocol for delivering bad news: application to the patient with cancer. <i>Oncologist</i>. 2000;5:302-311. https://theoncologist.onlinelibrary.wiley.com/doi/full/10.1634/theoncologist.5-4-302?sid=nlm%3Apubmed. 2021. • 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. 2021. • Makoul G. The SEGUE Framework for teaching and assessing communication skills. <i>Patient Educ Couns</i>. 2001;45(1):23-34. https://www.sciencedirect.com/science/article/abs/pii/S0738399101001367?via%3Dihub. 2021. • 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/. 2021. • O'Sullivan P, Chao S, Russell M, Levine S, Fabiny A. Development and implementation of an objective structured clinical examination to provide formative feedback on communication and interpersonal skills in geriatric training. <i>J Am Geriatr Soc</i>.

2008;56(9):1730-5. <https://agsjournals.onlinelibrary.wiley.com/doi/abs/10.1111/j.1532-5415.2008.01860.x>. 2021.

- 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://bmcmmededuc.biomedcentral.com/articles/10.1186/1472-6920-9-1>. 2021.
- SCORE modules
- Team STEPS

Interpersonal and Communication Skills 2: Interprofessional and Team Communication Overall Intent: To effectively communicate with the multidisciplinary health care team, including consultants, in both straightforward and complex situations, with particular emphasis on the ICU setting	
Milestones	Examples
<p>Level 1 <i>Clearly and concisely requests and responds to a consultation</i></p> <p><i>Uses language that values all members of the health care team</i></p>	<ul style="list-style-type: none"> • Informs consult service of the recommendation • Allows others to express their opinions • Politely accepts requests for consult in the emergency department • Consistently uses inclusive language
<p>Level 2 <i>Verifies understanding of recommendations when providing or receiving a consultation</i></p> <p><i>Communicates information effectively to 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"> • Uses closed-loop communications and restating to verify emergency department understands plan or consult recommendations • Asks for specialist consultation in complex diabetes management • Specifies urgency of consult request
<p>Level 3 <i>Coordinates recommendations from different members of the health care team to optimize patient care</i></p> <p><i>Uses active listening to adapt 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"> • Leads a complex trauma resuscitation, using closed-loop communication, to ensure each patient care task is assigned and completed • Leads a team debrief after a patient death • Demonstrates active listening by asking team members about their concerns and questions during patient rounds • Respectfully provides feedback to medical students about their presentations during morning rounds
<p>Level 4 <i>Resolves conflict within the interdisciplinary team</i></p> <p><i>Maintains effective communication in a crisis situation</i></p>	<ul style="list-style-type: none"> • Negotiates with other clinical services to optimize care for a complex medical patient with surgical issues • Identifies then mentors/coaches more junior resident to improve communication skills within the team • Deciding with the neurosurgery team when a patient with multiple system injuries can appropriately be taken to the operating room for spinal stabilization

<p><i>Communicates constructive feedback to superiors</i></p>	<ul style="list-style-type: none"> • Provides feedback to faculty members when expectations for coverage in clinic or operating room are not clear
<p>Level 5 <i>Coaches flexible communication strategies that value input from all health care team members</i></p> <p><i>Facilitates regular health care team-based feedback in complex situations</i></p>	<ul style="list-style-type: none"> • Organizes workshop to develop skills in delivering bad news to patients and families • Leads a root cause analysis for a critical care complication
<p>Assessment Models or Tools</p>	<ul style="list-style-type: none"> • Direct observation • Multisource feedback • Simulated encounters • Standardized patient encounters or OSCE
<p>Curriculum Mapping</p>	<ul style="list-style-type: none"> •
<p>Notes or Resources</p>	<ul style="list-style-type: none"> • Clapp JT, Diraviam SP, Lane-Fall MB, et al. Nephrology in the academic intensive care unit: A qualitative study of interdisciplinary collaboration. <i>Am J Kidney Dis.</i> 2020;75(1):61-71. https://www.ajkd.org/article/S0272-6386(19)30853-4/fulltext. 2021. • Hope AA, Hsieh SJ, Howes JM, et al. Let's talk critical. Development and evaluation of a communication skills training program for critical care fellows. <i>Ann Am Thorac Soc.</i> 2015;12(4):505-511. https://www.atsjournals.org/doi/10.1513/AnnalsATS.201501-040OC?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub++0pubmed&. 2021. • Mills P, Neily J, Dunn E. Teamwork and communication in surgical teams: Implications for patient safety. <i>JACS.</i> 2007;206(1):107-112. https://www.journalacs.org/article/S1072-7515(07)00773-9/fulltext. 2021. • Non-Technical Training Skills for Surgeons (NOTSS). https://www.notss.org. 2021. • Team training courses

Interpersonal and Communication Skills 3: Communication within Health Care Systems Overall Intent: To develop skills and behaviors that allows the resident to communicate effectively within the context of a health care system	
Milestones	Examples
Level 1 <i>Verifies and accurately records current and relevant information in the patient's chart</i>	<ul style="list-style-type: none"> Creates an accurate, original note containing the reading of a pre-operative echocardiography report, and concisely summarizes the assessment and plan to proceed with the planned operation
Level 2 <i>Concisely documents diagnostic and therapeutic reasoning, accurately reflecting patient course for common conditions</i>	<ul style="list-style-type: none"> Documents the basic information of a pre-operative echocardiogram for a patient with mild congestive heart failure and preoperative optimization, incorporating a plan for targeted volume resuscitation as needed
Level 3 <i>Concisely documents diagnostic and therapeutic reasoning, accurately reflecting patient course for complex conditions</i>	<ul style="list-style-type: none"> Documents the interpretation and implications of the preoperative echocardiogram in a patient with sepsis and severe aortic stenosis and clearly lays out a plan for volume status, heart rate management and intra-operative transesophageal echocardiogram
Level 4 <i>Concisely documents diagnostic and therapeutic reasoning, accurately reflecting patient course for all conditions while satisfying institutional billing needs and compliance</i>	<ul style="list-style-type: none"> Crafts a note with details of assessment and plan for patient with metastatic cancer but reasonable quality of life and anticipated life expectancy; communicates with the surgical attending and relevant medical teams as well as the anesthetic team to coordinate appropriate expectations peri-operatively; documents the wishes of the patient not to have a tracheostomy if prolonged ventilator support is needed, and codes the encounter with the appropriate evaluation and management elements
Level 5 <i>Mentors others in documenting diagnostic and therapeutic reasoning, and accurately reflecting patient course</i>	<ul style="list-style-type: none"> Mentors/coaches colleagues how to improve clinical notes, including terminology, billing compliance, conciseness, and inclusion of all required elements Monitors and educates learners of Health Insurance Portability and Accountability Act (HIPAA)-compliant electronic communication (e.g., texting)
Assessment Models or Tools	<ul style="list-style-type: none"> Chart stimulated recall Direct observation Medical record (chart) audit Multisource feedback
Curriculum Mapping	<ul style="list-style-type: none">
Notes or Resources	<ul style="list-style-type: none"> 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/abs/10.1080/10401334.2017.1303385?journalCode=html20. 2021. U.S. Department of Health & Human Services. Health Information Privacy. HHS.gov/hipaa. 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: Respiratory Failure	PC1: Respiratory Failure
PC2: Nutritional Support	PC2: Nutritional Support
PC3: Shock/Resuscitation	PC3: Shock/Resuscitation
PC4: Acute Kidney Injury	PC4: Renal Disorders of Critically Ill Patients
PC5: Trauma and Burns	PC5: Trauma and Thermal Injury
PC6: Cardiac Disorders of Critically-Ill Patients	PC6: Cardiovascular Disorders of Critically Ill Patients
PC7: Neurologic Disorders of Critically-Ill Patients	PC7: Neurologic Disorders of Critically Ill Patients
PC8: Gastrointestinal (GI) Disorders of Critically-Ill Patients	PC8: Gastrointestinal Disorders of Critically Ill Patients
PC9: Infectious Diseases of Critically-Ill Surgical Patients	PC9: Infectious Diseases of Critically Ill Surgical Patients
PC10: Procedural Competence*	PC10: Procedural Competence
MK1: Respiratory Failure (Ventilator-Associated Events)	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
MK2: Nutritional Support	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
MK3: Shock/Resuscitation	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
MK4: Acute Kidney Injury	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
MK5: Trauma and Burns	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care

	MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
MK6: Cardiac Disorders of Critically-Ill Patients	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
MK7: Neurologic Disorders of Critically-Ill Patients	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
MK8: GI Disorders of Critically-Ill Patients	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
MK9: Infectious Diseases of Critically-Ill Surgical Patients	MK1: Pathophysiology, Pharmacology, and Therapeutics in Critical Care MK2: Prognosis in Critical Care Conditions MK3: Clinical Reasoning in Critical Care
SBP1: Administrative Responsibility	SBP1: Patient Safety and Quality Improvement (QI)
SBP2: Coordination and Transitions of Care	SBP2: System Navigation for Patient-Centered Care
	SBP3: Community and Population Health SBP4: Physician Role in Health Care Systems
PBL11: Improvement of Care	PBL11: Evidence-Based and Informed Practice SBP1: Patient Safety and Quality Improvement
PBL12: Teaching	
PBL13: Self-Directed Learning	PBL12: Reflective Practice and Commitment to Personal Growth
PROF1: Professionalism and Personal Behavior	PROF2: Professional Behavior and Accountability
PROF2: Ethical Issues in Critically-Ill Patients	PROF1: Ethical Principles
PROF3: Personal Responsibility	PROF2: Professional Behavior and Accountability
PROF4: Healthy Work Environment	PROF3: Self-Awareness and Help-Seeking
ICS1: Effective Communication with Patients and Families	ICS1: Patient- and Family-Centered Communication
ICS2: Effective Communication with the HealthCare Team	ICS2: Interprofessional and Team Communication
	ICS3: Communication within Health Care Systems

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/>