Supplemental Guide:

Anesthesiology

ACGME

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Milestones Supplemental Guide

This document provides additional guidance and examples for the 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.
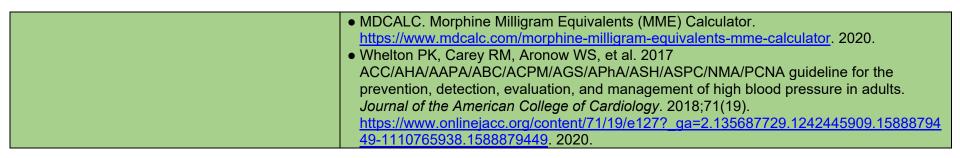
Additional tools and references, including the Milestones Guidebook, Clinical Competency Committee Guidebook, and Milestones Guidebook for Residents and Fellows, are available on the Resources page of the Milestones section of the ACGME website.

Patient Care 1: Pre-Anesthetic Evaluation	
Overall Intent: To demonstrate the necessary skills to gather and interpret all relevant data in preparation for surgery; to determine necessary optimization, and to assign risk stratification in the pre-operative period	
Milestones	**Examples**
Level 1 *Performs basic chart review* *Conducts patient interview, with direct supervision* *Conducts and interprets a physical examination, with direct supervision*	● Reviews patient's chart and identifies/reports that a patient with hypertension and diabetes requires preparation for a cholecystectomy ● Obtains a basic history in a patient for cholecystectomy and identifies hypertension and diabetes as comorbidities ● Performs general physical examination in preparation for a cholecystectomy
Level 2 *Performs focused chart review, with indirect supervision* *Interviews the patient and gathers pertinent information, with indirect supervision* *Conducts a focused physical examination, with indirect supervision*	● During a chart review, seeks serial blood pressure measurements, an electrocardiogram (EKG), serial finger sticks for glucose control, and an HbA1c level ● While obtaining patient history, elucidates decreased exercise tolerance (e.g., cannot walk up two flights of stairs), shortness of breath or chest pain with exertion ● In addition to the standard cardiopulmonary and airway exams, identifies signs of poor glycemic control (e.g., wound healing) and neurovascular and cardiopulmonary findings
Level 3 *Interprets chart review information to assess need for further work-up* *Interprets information collected during patient interview, with assistance* *Identifies comorbidities on physical examination that may require further evaluation, with indirect supervision*	● Discovers elevated glucose, hemoglobin A1C levels and refers patient to primary care doctor for tighter glucose control ahead of scheduled surgery ● Recognizes the risk of undiagnosed cardiovascular disease based on poor exercise tolerance or signs of end-organ damage due to poorly controlled diabetes ● Distinguishes abnormal heart sounds and/or poor organ perfusion (i.e., altered mentation, poor capillary refill) consistent with cardiac dysfunction
Level 4 *Evaluates diagnostic data and provides risk stratification based on comorbidities and anesthetic implications* *Independently identifies the need for additional evaluation and suggests therapeutic interventions*	● Reviews data specific to glucose control and cardiovascular status (e.g., echocardiogram) to calculate the modified cardiac risk index ● Considers that low exercise tolerance may be suggestive of cardiac decompensation and suggests optimization prior to surgery

Independently identifies concerning physical exam findings that require further evaluation	● Correlates physical exam findings suggestive of cardiac dysfunction and recommends further work up from cardiology (i.e., stress test)
Level 5 *Independently identifies a previously undiagnosed condition*	● Auscultates a heart murmur and independently identifies a new diagnosis of aortic stenosis
Assessment Models or Tools	● Chart review ● Direct observation ● Multisource feedback ● Objective structured clinical examination (OSCE)
Curriculum Mapping	●
Notes or Resources	● Heart Online. New York Heart Association (NYHA) classification. https://www.heartonline.org.au/media/DRL/New_York_Heart_Association_(NYHA)_classification.pdf. 2020. ● Joint British Diabetes Socities for Inpatient Care. Management of adults with diabetesundergoing surgery and electiveprocedures: Improving standards. https://www.diabetes.org.uk/resources-s3/2017-09/Surgical%20guideline%202015%20-%20summary%20FINAL%20amended%20Mar%202016.pdf. 2020.

Patient Care 2: Peri-Operative Care and Management
Overall Intent: To develop and implement a patient/procedure-specific anesthetic plan

Milestones	Examples
Level 1 *Identifies the components of an anesthetic plan*	● Describes the need for general anesthesia with endotracheal intubation for a hypertensive and diabetic patient undergoing a laparoscopic cholecystectomy
Identifies the components of a pain management plan	● Describes the need for opioid or non-opioid analgesics in the anesthetic plan
Identifies potential impact of anesthesia beyond intra-operative period	● Explains that prolonged pain or post-operative nausea and vomiting may have a negative physiological and psychological impact on patient experience and recovery from surgery
Level 2 *Develops an anesthetic plan for a healthy patient undergoing uncomplicated procedures*	● Describes the need for endotracheal intubation for a planned laparoscopic cholecystectomy and the strategies to mitigate hemodynamic changes that occur during abdominal insufflation; calculates the patient's intravenous (IV) fluid requirements to replace nothing by mouth (NPO) deficits and intra-operative demands
Implements simple peri-operative pain management plan	● Describes a systematic approach to peri-operative pain, beginning with non-opioid analgesics; demonstrates knowledge of the role of opioid analgesics and the associated risks and benefits
Identifies patient specific risks factors for long-term anesthetic effects	● Explains that elderly patients may be at a higher risk for post-operative delirium or post-operative cognitive dysfunction, which may be further exacerbated by peri-operative administration of benzodiazepines and opioid analgesics
Level 3 *Develops an anesthetic plan for patients with well-controlled comorbidities or undergoing complicated procedures*	● Documents the patient's compliance with the use of the prescribed antihypertensives and medications for glycemic control; determines the medical necessity of a course of perioperative beta blockers and addresses any glycemic abnormalities prior to surgery
Identifies patients with a history of chronic pain who require a modified peri-operative pain management plan	● Documents the patient's pre-operative opioid analgesic regimen in Morphine Equivalent Daily Dose (MEDD) and anticipates the patient's potential increased analgesic and opioid requirements due to long-term use of opioids
Develops the anesthetic plan based on risk factors to mitigate the long-term impact of anesthesia	● Develops an induction plan to minimize hemodynamic instability, minimizes use of opioid analgesics, and lowers minimum alveolar concentration in an elderly patient to achieve a balanced anesthetic plan

Level 4 *Develops an anesthetic plan for patients with multiple, uncontrolled comorbidities, and undergoing complicated procedures* *Implements the anesthetic plan for patients with complex pain history and polypharmacy* *Implements the anesthetic plan to mitigate the long-term impact of anesthesia*	● Reviews the echocardiogram in a patient with moderate aortic stenosis and severe coronary artery disease, as well as a HbA1C of 8.2, and develops an induction plan to preserve cardiac output and plans for glycemic correction during a laparoscopic cholecystectomy, with a potential for an open procedure due to previous abdominal surgeries ● Contacts the pain management physician and discusses the risks and benefits of pre-operative opioid reduction prior to planned surgery to reduce peri-operative opioid requirements; continues pre-operative prescribed sustained release opioid analgesics during the peri-operative period; implements opioid withdrawal mitigation strategies ● Uses enhanced recovery after surgery protocols to minimize long term impact of anesthesia; considers a thoracic epidural for post-operative pain control to minimize opioid analgesic utilization/requirements following an open cholecystectomy
Level 5 *In collaboration with other specialists, develops protocols for multimodal analgesia plan for patients with a complex pain history and substance use disorder* *Develops departmental or institutional protocols for reduction of the long-term impact of anesthesia*	● Contacts the patient's addictionologist to coordinate continuation of the patient's methadone maintenance regimen during the peri-operative period and develops a plan for peri-operative analgesia including regional anesthesia adjuvant blocks [thoracic epidural infusions, Transversus Abdominis Plane Blocks (TAP) etc.], and IV medications such as nonsteroidal anti-inflammatory drugs (NSAIDs) and N-methyl-D-aspartate (NMDA) receptor antagonists, to minimize opioid analgesic use, and coordinates return of the patient's care to the addictionologist ● Serves on interdisciplinary task force investigating long term impact of anesthesia and ways to mitigate deleterious effects
Assessment Models or Tools	● Chart review ● Direct observation ● Multisource feedback ● OSCE
Curriculum Mapping	●
Notes or Resources	● American Pain Society. http://ampainsoc.org/. 2020. ● Centers for Disease Control and Prevention. Guidelines Resources. https://www.cdc.gov/drugoverdose/prescribing/resources.html. 2020. ● Edwards DA, Hedrick TL, Jayaram J, et al. American Society for Enhanced Recovery and Perioperative Quality Initiative joint consensus statement on perioperative management of patients on preoperative opioid therapy. *Anesth Analg*. 2019;129(2):553-566. doi:10.1213/ANE.0000000000004018 ● ERAS Society. List of Guidelines. https://erassociety.org/guidelines/list-of-guidelines/. 2020.

- MDCALC. Morphine Milligram Equivalents (MME) Calculator. https://www.mdcalc.com/morphine-milligram-equivalents-mme-calculator. 2020.
- Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults. *Journal of the American College of Cardiology*. 2018;71(19). https://www.onlinejacc.org/content/71/19/e127?_ga=2.135687729.1242445909.158887 94 49-1110765938.1588879449. 2020.

Patient Care 3: Application and Interpretation of Monitors	
Overall Intent: To demonstrate proficiency in the use of monitors in anesthesia practice and interpretation and application of data	
Milestones	**Examples**
Level 1 *Identifies standard monitors*	● Describes American Society of Anesthesiologists (ASA) guidelines for basic monitoring of patients undergoing anesthesia
Applies standard monitors to patients	● Chooses correct blood pressure cuff size, applies five lead EKG monitor correctly, and chooses appropriate pulse oximetry site for the scheduled procedure
Interprets standard monitoring data	● Describes normal reference ranges for blood pressure, heart rate, pulse oximetry, temperature, and end-tidal carbon dioxide
Level 2 *Independently selects central and arterial catheters based on patient comorbidities and procedure*	● Summarizes appropriate uses and contraindications for central and arterial catheterization; explains the rationale for close blood pressure monitoring in an uncontrolled, hypertensive patient, and how the insertion of the arterial line will enhance patient care
Inserts central and arterial catheters, with supervision	● Describes applicable anatomy, procures and prepares appropriate equipment, demonstrates proper sterile technique, and secures and labels lines mitigating improper use and dislodgement
Addresses malfunctions in standard monitors and interprets data from central and arterial lines, with supervision	● Identifies dampening or artifact in arterial waveforms and suggests ways to improve tracings; lists and interprets normal components of arterial and central venous pressure tracing after proper calibration
Level 3 *Selects advanced monitors based on patient comorbidities and procedure, with supervision*	● Develops a plan for awake insertion of arterial and central pressure monitoring in a patient with severe aortic stenosis and pulmonary hypertension and discusses the risks and benefits of transesophageal echocardiogram use in this patient's anesthetic plan
Inserts or applies advanced monitors, with supervision	● Safely inserts transesophageal echocardiogram probe, pulmonary artery catheter, or other advanced monitors with guidance during an anesthetic
Recognizes and addresses malfunctions in advanced monitors and interprets data, with supervision	● Expresses concern when unable to advance a transesophageal echocardiogram probe and asks for guidance and help in doing so

Level 4 *Independently selects advanced monitors based on patient comorbidities and procedure*	● Advocates for the use of intra-operative transesophageal echocardiogram as part of an anesthetic plan and obtains informed consent for its use prior to induction of anesthesia
Independently inserts or applies advanced invasive monitors	● Inserts and advances transesophageal echocardiogram probe for optimal viewing
Independently interprets data, recognizes, and addresses malfunctions in monitors and other anesthesia equipment	● Differentiates hyper- versus hypo-kinetic wall motion abnormalities on transesophageal echocardiogram, distinguishes between grossly normal versus abnormal valve function to customize anesthetic management based on real time findings, and identifies artifact ● Uses transesophageal echocardiogram data to direct fluid and vaso-active drug therapies
Level 5 *Functions as a consultant for difficult advanced monitor placement*	● Uses advanced monitors in either unusual congenital or acquired anatomical variants
Participates in the research and/or development of protocols for monitoring technology	● Pioneers novel or state-of-the-art use of technology to advance patient management or monitoring in complicated settings, and to enhance patient safety
Assessment Models or Tools	● Chart review ● Direct observation ● Multisource feedback ● OSCE
Curriculum Mapping	●
Notes or Resources	● American Society of Anesthesiologists. Standards for Basic Anesthetic Monitoring. https://www.asahq.org/standards-and-guidelines/standards-for-basic-anesthetic-monitoring. 2020. ● American Society of Echocardiography. Guidelines by Topic. https://www.asecho.org/guidelines/guidelines-standards/. 2020.

Patient Care 4: Intra-Operative Care	
Overall Intent: To safely deliver an anesthetic to all patients intra-operatively	

Milestones	Examples
Level 1 *Assists in the initiation of the anesthetic*	● Pre-oxygenates the patient prior to induction of general anesthesia
Assists in maintenance of anesthetic care	● Remains vigilant with monitoring of vital signs, urine output, and IV fluid administration
Assists with emergence from anesthesia	● Ensures suction catheter is in working order and oral airway is available
Level 2 *Plans and initiates the anesthetic for healthy patients undergoing uncomplicated procedures*	● Prepares induction medications and identifies correct doses for induction
Manages expected events during anesthetic care, with supervision	● Recognizes hypotension and administers pressors with supervision ● Describes muscle relaxant duration and re-doses appropriately
Anticipates and manages expected events during emergence, with supervision	● Suctions patients prior to extubation ● Recognizes emergence agitation and ensures patient safety
Level 3 *Plans and initiates the anesthetic in a patient with well-controlled comorbidities, or undergoing complicated procedures*	● Prepares induction medications and doses for a chronic hypertensive patient or a patient for a Whipple procedure
Independently manages expected events during anesthetic care	● Independently recognizes hypotension associated with tachycardia and prolonged NPO status and treats with fluids
Anticipates and manages unexpected events during emergence, with supervision	● Recognizes laryngospasm, administers positive pressure ventilation and calls for help, with supervision

Level 4 *Independently plans and initiates the anesthetic in a patient with multiple, uncontrolled comorbidities undergoing complicated procedures* *Independently manages unexpected events during anesthetic care* *Independently anticipates and manages unexpected events during emergence*	● Prepares operating room for awake fiberoptic intubation in a patient with unstable cervical spine undergoing posterior spinal fusion ● Recognizes acute coronary syndrome, considers etiologies and treats hypotension in a diabetic patient undergoing a Whipple procedure ● Independently recognizes laryngospasm and administers positive pressure ventilation, calls for help and prepares medications for reintubation
Level 5 *Manages rare events during anesthetic care* *Manages rare events during emergence*	● Recognizes malignant hyperthermia, calls for help, and leads the team to call Malignant Hyperthermia Association of the United States hotline and administer dantrolene ● Independently diagnosis and mages serotonin syndrome in the recovery room
Assessment Models or Tools	● Direct observation ● OSCE ● Simulation
Curriculum Mapping	●
Notes or Resources	● American Heart Association. Acute Coronary Syndrome. https://www.heart.org/en/health-topics/heart-attack/about-heart-attacks/acute-coronary-syndrome. 2020. ● American Society of Anesthesiologists. Standards for Basic Anesthetic Monitoring. https://www.asahq.org/standards-and-guidelines/standards-for-basic-anesthetic-monitoring. 2020. ● Goldhaber-Fiebert S, Lei V, Jackson ML, McCowan K. Simulation-based team training: Crisis resource management and the use of emergency manuals in the OR. *MedEdPORTAL*. 2014;10. https://www.mededportal.org/doi/10.15766/mep_2374-8265.9992. 2020. ● Malignant Hyperthermia Association of the United States. Managing A Crisis. https://www.mhaus.org/healthcare-professionals/managing-a-crisis/. 2020. ● Novalija J, Henry A, Ellinas H. Anesthesia core skill simulation package for anesthesia newbies. *MedEdPORTAL*. 2011;7. https://www.mededportal.org/doi/10.15766/mep_2374-8265.9051. 2020.

Patient Care 5: Airway Management	
Overall Intent: To prepare and manage patient's airway	

Milestones	Examples
Level 1 *Performs basic airway assessment* *Performs bag-mask ventilation in uncomplicated airway*	● Assigns Mallampati score ● Performs bag-mask ventilation for an uncomplicated induction in a healthy 21-year-old patient
Level 2 *Uses the airway exam and identifiable risk factors to formulate a patient-specific plan* *Prepares basic equipment and manages an uncomplicated airway*	● Secures videolaryngoscope for a patient who is Mallampati 2 with limited neck range motion ● Checks laryngoscope light, endotracheal tube balloon and intubates 21-year-old patient's Mallampati 2 airway

Level 3 *Devises airway management plans that address contingencies, with supervision*
 	
Prepares and incorporates advanced equipment in the management of a complicated airway, with supervision
	● With supervision:
	   ● Plans indirect laryngoscopy for a patient with body mass index (BMI) of 45 and Mallampati 3 airway, and ensures availability of supraglottic device and boogie
	   ● Selects appropriate size of supraglottic device, ensures functionality of fiberoptic scope
	   ● Successfully manages a difficult airway using advanced techniques

Level 4 *Independently devises airway management plans that address contingencies*
 	
Independently prepares and incorporates advanced equipment in the management of a complicated airway
	● Independently:
	   ● Plans indirect laryngoscopy for a patient with a BMI of 45 and a Mallampati 3 airway, and ensures availability of supraglottic device and boogie
	   ● Selects appropriate size of supraglottic device, ensures functionality of fiberoptic scope
	   ● Successfully manages a difficult airway using advanced techniques

Level 5 *Functions as an expert in an airway crisis for complicated airways*	● Manages fiberoptic intubation for an intensive care unit (ICU) patient with a known critical airway who self-extubated and calls otolaryngologist to bedside for potential surgical airway
Assessment Models or Tools	● Direct observation ● OSCE ● Simulation
Curriculum Mapping	●
Notes or Resources	● Abouleish AE, Leib ML, Cohen NH. ASA provides examples to each ASA physical status class. *ASA Monitor*. 2015;79:38-49. https://monitor.pubs.asahq.org/article.aspx?articleid=2434536. 2020.

- American Society of Anesthesiologists. ASA Physical Status Classification System. https://www.asahq.org/standards-and-guidelines/asa-physical-status-classification-system. 2020.
- Apfelbaum JL, Hagberg CA, Caplan RA, Blitt CD, et al. Practice guidelines for management of the difficult airway: An updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. *Anesthesiology*. 2013;118:251-270. https://anesthesiology.pubs.asahq.org/article.aspx?articleid=1918684. 2020.

Patient Care 6: Point-of-Care Ultrasound	
Overall Intent: To conduct and interpret point-of-care ultrasounds	

Milestones	Examples
Level 1 *Lists and explains the basic science and terminology of ultrasound* *Identifies relevant anatomy using ultrasound* *Uses ultrasound for vascular access in routine situations, with supervision*	● Explains the differences and components of commonly used ultrasound probes in anesthesiology ● Explains how frequency and wavelength interact in creating an ultrasound image; using ultrasound, identifies anatomical tissues (e.g., muscle, bone, fat, fluid) for placement of a peripheral IV or central venous catheter ● Using ultrasound, identifies the radial artery (and surrounding structures) for placement of an arterial catheter, with supervision
Level 2 *Selects ultrasound equipment for procedures, with supervision* *Conducts point-of-care ultrasound, with supervision* *Uses ultrasound for vascular access in routine situations*	● Prepares ultrasound equipment in sterile fashion and selects the appropriate probe/needle for placement of an interscalene block ● Identifies carotid artery, internal jugular vein, anterior and middle scalene muscles, sternocleidomastoid lateral border and obtains an ultrasound image for placement of an interscalene block, with supervision ● Obtains a focused transthoracic echo (fTTE) to assess pre-induction volume status ● Using ultrasound, independently identifies the radial artery (and surrounding structures) for placement of an arterial catheter
Level 3 *Selects ultrasound equipment for a patient with difficult anatomy, with supervision* *Interprets point-of-care ultrasound, with supervision* *Uses ultrasound for vascular access in complex situations, with supervision*	● Selects appropriate ultrasound probe and optimizes ultrasound image for an obese patient receiving an interscalene block ● Obtains an fTTE and interprets it for regional wall motion abnormalities with guidance ● Obtains abdominal ultrasound to assess gastric contents/NPO status ● Using ultrasound, visualizes the internal jugular vein and the carotid artery in placing a central venous catheter in a patient with coagulopathy and poor peripheral access
Level 4 *Independently selects proper ultrasound equipment and settings for indicated scenarios* *Independently conducts and interprets point-of-care ultrasound*	● Selects appropriate ultrasound probe, optimizes ultrasound images and performs cardiopulmonary exam to identify causes of respiratory distress (pneumothorax, pleural effusion, regional wall motion abnormalities) in a critically ill patient ● Independently performs a fTTE in a critically ill patient in respiratory distress and interprets it for regional wall abnormalities (congestive heart failure)

Independently uses ultrasound for vascular access in complex situations	● Independently uses ultrasound to manage a difficult airway (e.g., identifies cricothyroid membrane) ● Uses ultrasound to obtain peripheral vascular access in a patient with substance use disorder using intravenous drugs who has history of difficult access and refuses a central venous catheter
Level 5 *Participates in research of emerging ultrasound procedures* *Participates in the development of institutional protocols for point-of-care ultrasound*	● Reviews the literature to evaluate the utility of ultrasound in the placement of endotracheal tube in a patient with cervical stenosis and presents findings at regional and national conferences ● Creates an institutional protocol to incorporate ultrasound in acute airway management outside the operating room ● Creates NPO guidelines that include the use of point-of-care ultrasound in the evaluation of gastric contents to assess aspiration risk
Assessment Models or Tools	● Direct observation ● OSCE ● Simulation
Curriculum Mapping	●
Notes or Resources	● American Society of Regional Anesthesia and Pain Medicine. Why PoCUS? https://www.asra.com/page/310/why-pocus. 2020. ● Canty DJ, Royse CF, Kilpatrick D, Bowman L, Royse AG. The impact of focused transthoracic echocardiography in the pre-operative clinic. *Anaesthesia*. 2012;67(6):618-625. https://pubmed.ncbi.nlm.nih.gov/22352785/. 2020. ● New York School of Regional Anesthesia. Ultrasound-Guided Interscalene Brachial Plexus Block. https://www.nysora.com/techniques/upper-extremity/ultrasound-guided-interscalene-brachial-plexus-block/. 2020. ● Ramsingh D, Bronshteyn YS, Haskins S, Zimmerman J. Perioperative Point-of-Care Ultrasound: From concept to application. *Anesthesiology*. 2020;132:908-916. https://anesthesiology.pubs.asahq.org/article.aspx?articleid=2759442. 2020. ● The Society of Point of Care Ultrasound. POCUS Practice Guidelines. https://spocus.org/admin-resources/practice-guidelines/. 2020. ● Youtube – MedCram. Introduction to Point of Care Ultrasound (POCUS) – Basics. https://www.youtube.com/watch?v=7Yfe2vOpFmY. 2020.

Patient Care 7: Situational Awareness and Crisis Management
Overall Intent: To recognize and respond to the dynamic milieu of the operating room environment

Milestones	Examples
Level 1 *Demonstrates vigilance during clinical care*	● Limits use of personal electronic devices to calculate fluids, medication doses, or other patient care activities in the operating room ● Demonstrates continuous survey of the environment that includes monitors and surgical field
Articulates causes of common peri-operative crisis situations	● Describes differential diagnosis for hypoxia
Responds to crisis situations as a reliable team member	● Actively seeks ways to assist in care of the trauma patient
Level 2 *Demonstrates awareness of case flow and developments throughout a procedure*	● Informs attending of infiltrated IV intra-operatively
Recognizes crisis situations; calls for help	● Identifies unintended extubation and immediately calls for help
Participates in management during crisis situations	● Establishes large bore IV access in the care of the trauma patient
Level 3 *Demonstrates awareness of case flow and developments throughout a procedure, including those outside of one's own immediate control, with supervision*	● Informs attending of EKG changes, considers differential diagnosis requiring changes in the anesthetic plan
Anticipates impending crisis and identifies possible etiologies with supervision	● Recognizes subtle signs of excessive blood loss and prepares for massive transfusion, with supervision
Initiates management and resolves crisis situations, with supervision	● Activates massive transfusion protocol and executes balanced resuscitation, with supervision
Level 4 *Independently demonstrates awareness of case flow and developments throughout a procedure, including those outside of one's own immediate control*	● Informs attending of EKG changes requiring change in the anesthetic plan and after considering a differential diagnosis, makes adjustments in anesthesia provided

Independently anticipates impending crisis and identifies possible etiologies *Independently initiates management and resolves crisis situations*	● Independently recognizes subtle signs of excessive blood loss and prepares for massive transfusion ● Independently activates massive transfusion protocol and executes balanced resuscitation
Level 5 *Leads the health care team in the management of crisis situations*	● In the setting of conflicting opinions, recognizes acute surgical blood loss and initiates crisis response
Assessment Models or Tools	● Direct observation ● Mock orals ● Multisource feedback ● OSCE ● Simulation
Curriculum Mapping	●
Notes or Resources	● Anesthesia Patient Safety Foundation. Distractions in the Operating Room: An Anesthesia Professional's Liability? https://www.apsf.org/article/distractions-in-the-operating-room-an-anesthesia-professionals-liability/. 2020. ● Athlos Academies. Top 10 Takeaways from Crucial Conversations. https://athlosacademies.org/top-10-takeaways-from-crucial-conversations/. 2020. ● McIlvaine WB. Situational awareness in the operating room: A primer for the anesthesiologist. Seminars Anesthesia Perioperative. *Med Pain*. 2007;26:167-172. doi:10.1053/j.sane. ● UpToDate. Massive Blood Transfusion. https://www.uptodate.com/contents/massive-blood-transfusion. 2020.

Patient Care 8: Post-Operative Care	
Overall Intent: To effectively manage routine post-operative care and complications related to anesthesia	

Milestones	Examples
Level 1 *Outlines post-operative disposition options for patients*	● Lists home, floor, telemetry, step-down, or ICU as possible dispositions for a patient
Lists complications commonly encountered post-operatively	● Identifies post-operative nausea and vomiting, pain, hypoxia, residual muscle weakness, delirium, etc.
Level 2 *Plans disposition for uncomplicated procedures*	● Identifies need to admit a planned outpatient with chronic lung disease for an acute exacerbation
Diagnoses, manages, and documents commonly encountered complications arising from anesthetic care, with supervision	● Recognizes a corneal abrasion, implements treatment and documents the complication in the electronic health record (EHR)
Level 3 *Identifies unexpected changes in patient status meriting change in disposition, with supervision*	● With supervision: 　● Identifies respiratory failure in the post-anesthesia care unit (PACU) and the need for reintubation and ICU admission
Diagnoses, manages, and documents uncommon complications arising from anesthetic care, with supervision	● Recognizes serotonin syndrome, implements treatment, and documents the complication in the EHR
Level 4 *Independently identifies unexpected changes in patient status meriting change in disposition*	● Independently: 　● Identifies respiratory failure in the PACU and the need for reintubation and ICU admission and informs attending
Independently diagnoses, manages, and documents uncommon complications arising from anesthetic care	● Recognizes serotonin syndrome, implements treatment, and documents the complication in the EHR and informs attending
Level 5 *Develops protocols for disposition based on procedure and patient comorbidities*	● Develops a sleep apnea protocol for post-operative disposition
Assessment Models or Tools	● Direct observation ● Morbidity and mortality presentation/committees ● Mock orals ● Multisource feedback ● OSCE ● Simulation

Curriculum Mapping	●
Notes or Resources	● The Join Commission. Sentinel Event. https://www.jointcommission.org/en/resources/patient-safety-topics/sentinel-event/. 2020. ● American Society of Anesthesiologists. Standard for Postanesthesia Care. https://www.asahq.org/standards-and-guidelines/standards-for-postanesthesia-care. 2020. ● Apfelbaum JL, the Task Force on Postanesthetic Care, Silverstein JH, Chung FF. Practice guidelines for postanesthetic care: An updated report by the American Society of Anesthesiologists Task Force on Postanesthetic Care. *Anesthesiology*. 2013;118:291-307. https://anesthesiology.pubs.asahq.org/article.aspx?articleid=1918686. 2020.

Patient Care 9: Critical Care	
Overall Intent: To provide care for the critically ill patient outside of the operating room	

Milestones	Examples
Level 1 *Acquires data for the care of the critically-ill patient* *Recognizes when a patient is critically ill*	● Collects laboratory and imaging results in preparation for presenting during rounds ● Recognizes and reports respiratory failure, hemodynamic instability, and significant neurologic changes
Level 2 *Interprets routine diagnostic data in the care of critically-ill patients* *Prioritizes the care of the critically-ill patient* *Implements the care team's plan for a critically-ill patient*	● Identifies pulmonary edema on a chest imaging ● Prioritizes need for diuresis before nutritional needs of a patient with pulmonary edema ● Orders diuretics and reassesses their impact on pulmonary edema
Level 3 *Interprets advanced diagnostic data in the care of critically-ill patients, with supervision* *Prioritizes the care of multiple critically-ill patients, with supervision* *Develops and implements a comprehensive plan of care for the critically-ill patient, with supervision*	● With supervision: 　● Evaluates the progression of pulmonary edema using point-of-care ultrasound 　● Interprets a two-dimensional echocardiogram for global heart function 　● Prioritizes the care of a patient with acute coronary syndrome over a patient with stable congestive heart failure 　● Manages therapies for a patient with acute coronary syndrome
Level 4 *Independently interprets advanced diagnostic data in the care of critically-ill patients* *Independently prioritizes the care of multiple critically-ill patients* *Develops and implements a comprehensive plan of care for the critically-ill patient*	● Independently: 　● Interprets a point of care ultrasound to see progression of pulmonary edema 　● Interprets a two-dimensional echocardiogram for global heart function 　● Prioritizes the care of a patient with acute coronary syndrome over a patient with stable congestive heart failure 　● Manages therapies for a patient with acute coronary syndrome with consultation as indicated
Level 5 *Leads and deploys resources in the care of the critically-ill patient*	● Leads the team to consult with the cardiologist and mobilize the cath lab while managing therapies for a patient with acute coronary syndrome

Functions in a supervisory role managing all patients in a unit and the unit's resources	● Recognizes a surgical emergency in a critically ill patient and mobilizes necessary resources to go to the operating room ● Leads rounds and appropriately assigns patients to members of the team based on patient acuity and resident experience
Assessment Models or Tools	● Direct observation ● Mock orals ● Multisource feedback ● OSCE ● Simulation
Curriculum Mapping	●
Notes or Resources	● Ghaffar S, Pearse RM, Gillies MA. ICU admission after surgery: Who benefits?. *Curr Opin Crit Care*. 2017;23(5):424-429. https://pubmed.ncbi.nlm.nih.gov/28777159/. 2020 ● Thompson SL, Lisco SJ. Postoperative Respiratory Failure. *Int Anesthesiol Clin*. 2018;56(1):147-164. https://europepmc.org/article/med/29189437. 2020. ● Society of Critical Care Medicine. Guidelines Online. https://www.sccm.org/Research/Guidelines/Guidelines. 2020.

Patient Care 10: Regional (Peripheral and Neuraxial) Anesthesia	
Overall Intent: To appropriately use regional anesthesia techniques in the care of surgical and obstetric patients	
Milestones	**Examples**
Level 1 *Describes anatomy relevant to regional anesthesia*	● Describes the innervation of the lower extremity
Prepares the patient and the equipment for common regional anesthesia techniques	● Appropriately positions patient for a regional anesthetic
Describes potential complications of regional anesthesia	● Describes the signs and symptoms of local anesthetic toxicity
Level 2 *Describes indications and contraindications for regional anesthesia*	● Selects appropriate regional anesthetic technique for orthopedic surgery; cancels block when patient refuses
Performs regional anesthesia techniques, with direct supervision	● Performs ultrasound-guided popliteal approach to sciatic nerve block with direct supervision
Recognizes and manages complications of regional anesthesia, with direct supervision	● Uses focused history and physical exam to diagnose post-operative nerve injury following regional techniques, with direct supervision
Level 3 *Develops a patient- and procedure-specific regional anesthesia plan, with supervision*	● Develops a plan for home-going peripheral nerve catheter placement for a fractured wrist, with supervision
Performs regional anesthesia techniques, with indirect supervision	● Places an epidural in a laboring patient with indirect supervision
Recognizes and manages complications of regional anesthesia, with indirect supervision	● Describe American Society of Regional Anesthesia and Pain Medicine (ASRA) guidelines for withholding antiplatelet and anticoagulation therapy prior to regional and neuraxial anesthesia and uses focused history and physical exam to diagnose and initiate treatment of an epidural hematoma in a patient following central neuraxial anesthesia, with indirect supervision
Level 4 *Independently develops a patient- and procedure-specific regional anesthesia plan*	● Independently, develops a regional anesthesia/analgesia plan for a surgical patient with chronic pain
Independently performs regional anesthesia techniques	● Independently performs and trouble shoots interscalene catheter placement

Independently recognizes and manages complications of regional anesthesia	● Independently diagnoses epidural spread from a lumbar plexus catheter, discusses complication with patient/family, and chooses course of management
Level 5 *Serves as a consultant on advanced or difficult regional techniques* *Develops institutional protocol for using regional anesthesia and managing complications*	● Assists colleagues with placement of an epidural catheter in a morbidly obese patient with severe scoliosis ● Collaborates with other health care team members to develop regional anesthesia-/analgesia-specific pathways for surgical procedures
Assessment Models or Tools	● Direct observation ● OSCE ● Simulation
Curriculum Mapping	●
Notes or Resources	● ASRA. Education. https://www.asra.com/education. 2020. ● The New York School of Regional Anesthesia (NYSORA). https://www.nysora.com/. 2020.

Medical Knowledge 1: Foundational Knowledge
Overall Intent: To demonstrate knowledge of medical and surgical diseases and pharmacology as related to peri-operative care

Milestones	Examples
Level 1 *Demonstrates knowledge of pathophysiology and treatment of medical and surgical conditions* *Identifies medications used to treat common comorbidities*	● Describes the pathophysiology and management of hypertension, diabetes, and asthma ● Lists medications used to manage hypertension including angiotensin-converting enzyme (ACE) inhibitors and beta blockers
Level 2 *Demonstrates knowledge of common medical and surgical disease, treatments, and populations as it relates to anesthetic care* *Demonstrates knowledge of pharmacology of medications routinely used in anesthetic care*	● Articulates potential complications of anesthesia administration such as bronchospasm and laryngospasm in a patient with asthma, upper respiratory infection, or chronic obstructive pulmonary disease ● Demonstrates knowledge of pharmacology of beta agonists (e.g., albuterol, terbutaline, epinephrine) to treat bronchospastic diseases in the peri-operative period ● Describes the pharmacology of depolarizing and nondepolarizing neuromuscular blocking agents
Level 3 *Demonstrates knowledge of complex medical and surgical disease, treatments, and populations as it relates to anesthetic care* *Demonstrates knowledge of medications used in subspecialty areas (e.g., cardiac, obstetrics)*	● Distinguishes pathophysiology of myasthenia gravis and Eaton-Lambert myasthenic syndrome in relation to anesthetic agents such as induction medications and neuromuscular blockers ● Articulates the differences between mannitol and hypertonic saline for use in a neurosurgical patient with intracranial hypertension ● Correctly identifies the use and mechanisms of action of agents such as vasopressin, protamine, heparin, inhaled nitric oxide, etc.
Level 4 *Demonstrates comprehensive knowledge of medical and surgical disease as it relates to the full spectrum of the patient's peri-operative care* *Demonstrates comprehensive knowledge of pharmacology in the setting of complex comorbidities*	● Plans, discusses and revises the perioperative management of a patient with unstable angina requiring emergency surgery ● Describes the mechanism of heparin induced thrombocytopenia and suggests alternatives to anticoagulation prior to cardiopulmonary bypass
Level 5 *Demonstrates scientific knowledge of uncommon, atypical, or complex conditions as it*	● Composes a plan for the peri-operative care of a patient with Fontan physiology for non-cardiac surgery

relates to the full spectrum of the patient's peri-operative care *Participates in research related to pharmacology*	● Collaborates in a research project investigating properties of novel neuromuscular blocking agents
Assessment Models or Tools	● Anesthesia Knowledge Test ● Basic exam ● Direct observation ● In-training exams ● Mock oral examinations ● Performance on question banks
Curriculum Mapping	●
Notes or Resources	● The American Board of Anesthesiology. Initial Certification in Anesthesiology. http://www.theaba.org/PDFs/BASIC-Exam/Basic-and-Advanced-ContentOutline. 2020.

Medical Knowledge 2: Clinical Reasoning
Overall Intent: To develop a complete and prioritized differential diagnosis while minimizing the impact of cognitive errors

Milestones	Examples
Level 1 *Organizes and accurately summarizes information obtained from the patient evaluation to develop a clinical impression*	● Presents a focused patient history (shortness of breath, exercise intolerance) and findings on physical exam (gallop, hepatomegaly, edema) using appropriate terminology; summarizes findings with a concise impression (congestive heart failure)
Lists types of clinical reasoning errors	● Describes confirmation bias, anchoring, and recall bias
Level 2 *Integrates information from all sources to develop a basic differential diagnosis for common patient presentations*	● Identifies an acute increase in airway pressure immediately after intubation with upsloping end tidal carbon dioxide (CO_2) tracing and listens to lung sounds as part of evaluation ● Recognizes acute bronchospasm as a leading cause of post intubation elevated airway pressures in a patient with history of asthma and wheezing on lung exam
Identifies clinical reasoning errors within patient care, with guidance	● Recognizes that failure of blood pressure cuff to cycle properly is not always a mechanical malfunction and palpates pulse and checks end tidal CO_2 while notifying attending
Level 3 *Develops a thorough and prioritized differential diagnosis for common patient presentations*	● Lists mucus plugging, mainstem intubation, and pneumothorax as possible etiologies in a patient with increased airway pressure, desaturation, and diminished breath sounds on one lung
Retrospectively applies clinical reasoning principles to identify errors	● Recognizes fixation error after having given bronchodilators to a desaturating patient without confirming proper positioning of the endotracheal tube
Level 4 *Develops prioritized differential diagnoses in complex patient presentations and incorporates subtle, unusual, or conflicting findings*	● Differentiates between phrenic nerve paralysis and pneumothorax in a patient with a supraclavicular block, and decreased lung sounds and hemodynamic decompensation after induction
Continually re-appraises one's clinical reasoning to improve patient care in real time	● Without prompting, discusses with faculty members previous errors in reasoning and develops strategies to avoid these in future cases
Level 5 *Coaches others to develop prioritized differential diagnoses in complex patient presentations*	● Develops and teaches algorithms for use by residents for diagnosis and management of elevated peak airway pressures associated with hypoxia ● Develops a simulation-based curriculum for teaching clinical reasoning
Models how to recognize errors and reflect upon one's own clinical reasoning	● Hosts a resident complications' conference and shares past errors to help educate peers
Assessment Models or Tools	● Direct observation ● Multisource feedback

	● Self-assessment ● Simulation
Curriculum Mapping	●
Notes or Resources	● Kempainen RR, Migeon MB, Wolf FM. Understanding our mistakes: A primer on errors in clinical reasoning. *Med Teach*. Mar;2003;25(2):177-181. https://pubmed.ncbi.nlm.nih.gov/12745527/. 2020. ● Norman GR, Monteiro SD, Sherbino J, Ilgen JS, Schmidt HG, Mamede S. The causes of errors in clinical reasoning: cognitive biases, knowledge deficits, and dual process thinking. *Academic Medicine*. 2017;92(1):23-30. https://journals.lww.com/academicmedicine/Fulltext/2017/01000/The_Causes_of_Errors_in_Clinical_Reasoning_.13.aspx. 2020. ● Stiegler MP, Tung A. Cognitive processes in anesthesiology decision making. *Anesthesiology*. 2014;120(1):204-217. https://anesthesiology.pubs.asahq.org/article.aspx?articleid=1918006. 2020.

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**
Level 1 *Demonstrates knowledge of common events that impact patient safety*	● Lists patient misidentification or medication errors as common patient safety events
Demonstrates knowledge of how to report patient safety events	● Explains how to report errors in own health system
Demonstrates knowledge of basic quality improvement methodologies and metrics	● Describes fishbone tool
Level 2 *Identifies system factors that lead to patient safety events*	● Identifies a recent change to the transfusion requisition form that did not include space for two-person verification to avoid an error ● Identifies that a regional anesthesia consent form does not include laterality
Reports patient safety events through institutional reporting systems (simulated or actual)	● Reports lack of compliance with antibiotic administration through departmental or institutional reporting systems
Describes departmental quality improvement initiatives	● Summarizes protocols to decrease surgical site infections
Level 3 *Participates in analysis of patient safety events (simulated or actual)*	● Assimilates patient data, evaluates the root cause, and presents the findings of a patient safety event
Participates in disclosure of patient safety events to patients and families (simulated or actual)	● Through simulation, communicates with patients/families about a medication administration error
Participates in department quality improvement initiatives	● Participates in a root cause analysis of duplicate acetaminophen administration in PACU
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)*	● Collaborates with a team to conduct the analysis of intra-operative antibiotic administration errors and presents suggested policy and EHR design changes at a department meeting
Discloses patient safety events to patients and families (simulated or actual)	● Discusses with patient (family) an inadvertent double-dose of acetaminophen administration given to them due to hand-off error

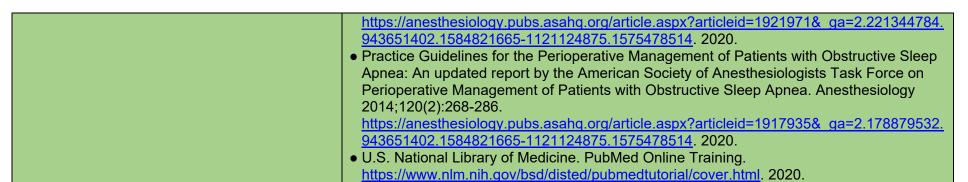|	
Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project	● Initiates and develops a resident quality improvement project to improve peri-operative hand-offs and presents findings to the department
Level 5 *Actively engages teams and processes to modify systems to prevent patient safety events*	● Assumes a leadership role at the departmental or institutional level for patient safety
Role models or mentors others in the disclosure of patient safety events	● Conducts a simulation for disclosing patient safety events
Creates, implements, and assesses quality improvement initiatives at the institutional level or above	● Initiates and completes a QI project to improve disclosure of serious adverse events to patients and families and shares results with stakeholders
Assessment Models or Tools	● Direct observation ● E-module multiple choice tests ● Multisource feedback ● Portfolio ● OSCE ● Reflection ● Simulation
Curriculum Mapping	●
Notes or Resources	● Anesthesia Patient Safety Foundation. Patient Safety Initiatives. https://www.apsf.org/patient-safety-initiatives/. 2020. ● Institute of Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. 2020.

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	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of care coordination* *Identifies key elements for safe and effective transitions of care and hand-offs* *Demonstrates knowledge of population and community health needs and disparities*	● For a critically ill trauma patient, identifies the surgeons, anesthesiologists, 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
Level 2 *Coordinates care of patients in routine clinical situations effectively using the roles of the interprofessional team members* *Performs safe and effective transitions of care/hand-offs in routine clinical situations* *Identifies specific population and community health needs and inequities for their local population*	● Coordinates care with the PACU and primary medical team on arrival to PACU ● Routinely uses a standardized tool for a stable patient during PACU sign-out ● Identifies challenges in communicating with patients with communication barriers (e.g., non-English-speaking patients and families; hearing, visual or cognitive impairment;)
Level 3 *Coordinates care of patients in complex clinical situations effectively using the roles of the interprofessional team members* *Performs safe and effective transitions of care/hand-offs in complex clinical situations* *Uses institutional resources effectively to meet the needs of a patient population and community*	● Works with the patient, family, and members of the peri-operative 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 undergoing coronary artery bypass surgery
Level 4 *Role models effective coordination of patient-centered care among different disciplines and specialties*	● During ICU rounds, leads team members in approaching consultants to review cases/recommendations and arranges multidisciplinary rounds for the team

Role models and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems	● Prior to rotating off the ICU service, proactively informs the incoming resident about a plan of care for a patient awaiting a liver transplant with multiple studies pending
Participates in changing and adapting practice to provide for the needs of specific populations	● Assists in the design of protocols for discussing and managing blood product usage in patients who refuse blood products for religious reasons
Level 5 *Analyzes the process of care coordination and participates in the design and implementation of improvements*	● Develops a program to arrange for pre-operative assessment of frailty in elderly patients
Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes	● Devises a protocol to improve transitions from ICU to step down or monitored unit
Advocates for populations and communities with health care inequities in the peri-operative setting	● 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
Assessment Models or Tools	● 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
Curriculum Mapping	●
Notes or Resources	● CDC. Population Health Training in Place Program (PH-TIPP). https://www.cdc.gov/pophealthtraining/whatis.html. 2020. ● Kaplan KJ. In pursuit of patient-centered care. March 2016. http://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns. 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. 2020.

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**
Level 1 *Identifies key components of the complex health care system (e.g., hospital, skilled nursing facility, finance, personnel, technology)*	● Articulates differences between ambulatory surgical center and inpatient hospital facilities ● Identifies that notes and records must meet billing and coding requirements
States factors impacting the costs of anesthetic care	● Explains relative cost of anesthetic medications, monitors and supplies
Level 2 *Describes how components of a complex health care system are interrelated, and how this impacts patient care*	● Prioritizes planning for tracheostomy/gastrostomy for a patient with severe traumatic brain injury prior to discharge to a skilled nursing facility
Documents anesthetic detail to facilitate accurate billing and reimbursement	● Ensures anesthetic procedure accurately reflects procedure performed ● Documents all Centers for Medicare & Medicaid Services (CMS)-required components of anesthetic care performed during procedure
Level 3 *Discusses how individual practice affects the broader system (e.g., length of stay, readmission rates, clinical efficiency)*	● Ensures that patients with post-operative nausea and vomiting receive adjusted anesthetic plans and adequate prophylaxis to avoid unnecessary hospitalization
Explains the impact of documentation on billing and reimbursement	● Discusses the necessity of including the ultrasound image for an ultrasound guided procedure to receive reimbursement
Level 4 *Manages various components of the complex health care system to provide efficient and effective patient care and transition of care*	● Effectively works with the social work team to ensure interpretive services are available for non-English-speaking patients both pre- and post-operatively
Practices and advocates for cost-effective patient care	● Effectively plans and implements anesthetic to promote enhanced recovery and rapid discharge
Level 5 *Advocates for or leads systems change that enhances high-value, efficient, and effective patient care*	● Works with peri-operative teams to develop and implement enhanced recovery protocols for surgical service lines
Engages in external activities related to advocacy for cost-effective care	● Improves informed consent process for non-English-speaking patients requiring interpreter services
Assessment Models or Tools	● Direct observation

	● Medical record (chart) audit ● Patient satisfaction data ● Portfolio
Curriculum Mapping	●
Notes or Resources	● Agency for Healthcare Research and Quality. Measuring the Quality of Physician Care. https://www.ahrq.gov/talkingquality/measures/setting/physician/index.html. 2020. ● AHRQ. Major Physician Measurement Sets. https://www.ahrq.gov/talkingquality/measures/setting/physician/measurement-sets.html. 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. *Anesth Analg*. 2018;126(2):588-599. https://journals.lww.com/anesthesia-analgesia/Fulltext/2018/02000/Antiemetic_Prophylaxis_as_a_Marker_of_Health_Care.35.aspx. 2020. ● Dzau VJ, McClellan M, Burke S, et al. Vital directions for health and health care: priorities from a National Academy of Medicine Initiative. *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. 2020. ● Teja BJ, Sutherland TN, Barnett SR, Talmor DS. Cost-effectiveness research in anesthesiology. *Anesth Analg.* 2018;127(5):1196-1201. https://pubmed.ncbi.nlm.nih.gov/29570150/. 2020.

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 *Accesses and uses evidence in routine patient care*	● Reviews the most recent practice advisory for pre-anesthesia evaluation and applies it in the pre-operative evaluation clinic
Level 2 *Articulates clinical questions and elicits patient preferences and values to guide evidence-based care*	● In a patient with congestive heart failure, calculates and discusses peri-operative surgical risk, and solicits patient perspective regarding peri-operative care
Level 3 *Locates and applies the best available evidence, integrated with patient preference, to the care of complex patients*	● Obtains, discusses, and applies evidence for the peri-operative management of a patient with coronary artery stents ● Understands and appropriately uses clinical practice guidelines for the peri-operative management of a patient with obstructive sleep apnea while eliciting their preferences
Level 4 *Appraises and applies evidence, even in the face of uncertainty and conflicting evidence, to guide individualized care*	● Accesses the primary literature to discuss current evidence about anesthesia and the developing brain and guide peri-operative care ● Reviews primary literature regarding administration of blood products in the peri-operative setting
Level 5 *Coaches others to appraise and apply evidence for complex patients and/or participates in the development of guidelines*	● Leads clinical teaching on application of best practices in peri-operative blood product management outside the operative room ● Reviews evidence and develops processes to lower environmental contamination and decrease waste in the operating room and perioperative arena ● As part of a team, develops airway protocols and rapid response teams for hospitals
Assessment Models or Tools	● Direct observation ● Oral or written examinations ● Oral presentations ● Research and quality improvement projects
Curriculum Mapping	●
Notes or Resources	● ACS. Risk Calculator. https://riskcalculator.facs.org/RiskCalculator/PatientInfo.jsp. 2020. ● ASA. Standards and Guidelines. https://www.asahq.org/standards-and-guidelines. 2020. ● Practice Advisory for Preanesthesia Evaluation: An updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. *Anesthesiology.* 2012;116(3):522-538. https://anesthesiology.pubs.asahq.org/article.aspx?articleid=2443414&_ga=2.145847356.943651402.1584821665-1121124875.1575478514. 2020. ● Practice Alert for the Perioperative Management of Patients with Coronary Artery Stents: A report by the American Society of Anesthesiologists Committee on Standards and Practice Parameters. *Anesthesiology.* 2009;110(1):22-23.

	https://anesthesiology.pubs.asahq.org/article.aspx?articleid=1921971&_ga=2.221344784.943651402.1584821665-1121124875.1575478514. 2020. ● Practice Guidelines for the Perioperative Management of Patients with Obstructive Sleep Apnea: An updated report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea. Anesthesiology 2014;120(2):268-286. https://anesthesiology.pubs.asahq.org/article.aspx?articleid=1917935&_ga=2.178879532.943651402.1584821665-1121124875.1575478514. 2020. ● U.S. National Library of Medicine. PubMed Online Training. https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html. 2020.

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**
Level 1 *Accepts responsibility for personal and professional development by establishing goals*	● Completes self-reflective goals prior to meeting with the program director
Identifies the factors that contribute to performance deficits	● Identifies gaps in knowledge of mechanisms of drug action ● Identifies that fatigue, stressors and perceived life-work imbalance contribute to performance deficits
Actively seeks opportunities to improve	● Asks for feedback from patients, families, and patient care team members ● Uses institutional provided resources to balance personal/professional commitments and obligations
Level 2 *Demonstrates openness to performance data (feedback and other input) to form goals*	● Integrates feedback to adjust peri-operative management of patients with history of post-operative nausea and vomiting
Analyzes and acknowledges the factors that contribute to performance deficits	● Assesses time management skills and how they impact turnovers and on-time starts
Designs and implements a learning plan, with prompting	● When prompted, develops individual education plan to improve their evaluation of patients with a history of post-operative nausea and vomiting
Level 3 *Seeks performance data episodically, with adaptability and humility*	● Obtains chart data to determine incidence of post-operative nausea and vomiting in own patients, in association with post-operative nausea and vomiting preventative medications
Institutes behavioral change(s) to improve performance	● Completes focused literature review before providing anesthesia
Independently creates and implements a learning plan	● Implements strategies that improve behaviors such as trust, interdependence, genuineness, empathy, risk, team building, and success
Level 4 *Intentionally seeks performance data consistently, with adaptability and humility*	● Obtains a quarterly chart audit to determine incidence of post-operative nausea and vomiting in own patients and alters practice accordingly
Considers alternatives to improve performance	● 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

Integrates performance data to adapt the learning plan	● Based on audit of incidence of post-operative nausea and vomiting in own patients, identifies knowledge gaps and reads current practice guidelines to improve care
Level 5 *Role models consistently seeking performance data, with adaptability and humility* *Models reflective practice* *Facilitates the design and implementation of learning plans for others*	● 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 central line placement based on previously received feedback ● Assists more junior residents in developing their individualized learning plans
Assessment Models or Tools	● Direct observation ● Review of learning plan
Curriculum Mapping	●
Notes or Resources	● Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: practice-based learning and improvement. *Acad Pediatr.* 2014;14:S38-S54. https://pubmed.ncbi.nlm.nih.gov/24602636/. 2020. ● Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. *Academic Medicine.* 2009;84(8):1066-1074. https://journals.lww.com/academicmedicine/fulltext/2009/08000/Measurement_and_Correlates_of_Physicians__Lifelong.21.aspx. 2020. ● 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. *Academic Medicine.* 2013;88(10):1558-1563. https://journals.lww.com/academicmedicine/fulltext/2013/10000/Assessing_Residents__Written_Learning_Goals_and.39.aspx. 2020. ● Reed S, Lockspeiser TM, Burke A, et al. Practical suggestions for the creation and use of meaningful learning goals in graduate medical education. *Academic Pediatrics.* 2016;16(1):20-24. https://www.academicpedsjnl.net/article/S1876-2859(15)00333-2/pdf. 2020.

Professionalism 1: Professional Behavior and Ethical Principles	
Overall Intent: To recognize and address lapses in ethical and professional behavior, demonstrates ethical and professional behaviors, and use appropriate resources for managing ethical and professional dilemmas	
Milestones	**Examples**
Level 1 *Identifies potential triggers for professionalism lapses* *Describes when and how to report lapses in professionalism* *Demonstrates knowledge of the ethical principles underlying patient care*	● 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)
Level 2 *Demonstrates insight into professional behavior in routine situations* *Takes responsibility for one's own professionalism lapses* *Analyzes straightforward situations using ethical principles*	● 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 of the risks ● Identifies surrogate for impaired patients
Level 3 *Demonstrates professional behavior in complex or stressful situations* *Recognizes need to seek help in managing and resolving complex interpersonal situations* *Analyzes complex situations using ethical principles*	● Appropriately responds to a distraught family member, following a peri-operative complication ● Appropriately handles conversations in the operating room 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 ● 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
Level 4 *Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in oneself* *Actively solicits help and acts on recommendations to resolve complex interpersonal situations* *Recognizes and utilizes resources for managing and resolving ethical dilemmas*	● Actively solicits the perspectives of others ● Models respect for patients and promotes the same from colleagues, when a patient has been waiting an excessively long time for their surgery ● Recognizes and uses ethics consults, literature, risk-management/legal counsel in order to resolve ethical dilemmas ● Obtains institutional guidance on obtaining a consent for blood transfusion in pediatric Jehovah's Witness patients ● Recognizes and manages situations of medical futility
Level 5 *Coaches others when their behavior fails to meet professional expectations* *Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution*	● 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)
Assessment Models or Tools	● Direct observation ● Global evaluation ● Multisource feedback ● Oral or written self-reflection ● OSCE ● Simulation
Curriculum Mapping	●
Notes or Resources	● ASA. ASA Code of Ethics. https://www.asanet.org/code-ethics. 2020. ● American Medical Association. Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. 2020. ● Byyny RL, Papadakis MA, Paauw DS. *Medical Professionalism Best Practices*. Menlo Park, CA: Alpha Omega Alpha Medical Society; 2015. https://alphaomegaalpha.org/pdfs/2015MedicalProfessionalism.pdf. 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/. 2020.

	● 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 *Responds promptly to requests or reminders to complete tasks*	● Responds promptly to reminders from program administrator to complete work hour logs ● Attends conferences and other educational activities on time
Takes responsibility for failure to complete tasks	● Apologizes to team member(s) for unprofessional behavior without prompting
Level 2 *Performs tasks and responsibilities in a timely manner*	● Completes administrative tasks, documents safety modules, procedure review, and licensing requirements by specified due date
Recognizes situations that may impact one's own ability to complete tasks and responsibilities in a timely manner	● Before going out of town, completes tasks in anticipation of lack of computer access while traveling
Level 3 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations*	● 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 in order to avoid patient safety issues and compromise of patient care
Takes responsibility for tasks not completed in a timely manner and identifies strategies to prevent recurrence	● Apologizes to team member(s) for unprofessional behavior without prompting, offers restitution if possible and through self-reflection identifies root cause of failure
Level 4 *Prioritizes tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations*	● Takes responsibility for inadvertently omitting key patient information during hand-off and professionally discusses with the patient, family and interprofessional team
Proactively implements strategies to ensure that the needs of patients, teams, and systems are met	● Follows-up with a patient who had a complicated epidural placement after being discharged from the hospital to evaluate for post-dural puncture headache
Level 5 *Designs and implements an institutional systems approach to ensure timely task completion and shared responsibility*	● 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	● Compliance with deadlines and timelines ● Direct observation ● Global evaluations ● Multisource feedback

	● Self-evaluations and reflective tools ● Simulation
Curriculum Mapping	●
Notes or Resources	● ASA. ASA Code of Ethics. https://www.asanet.org/code-ethics. 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 *Recognizes the importance of addressing personal and professional well-being*	● Acknowledges own response to patient's fatal genetic diagnosis ● Is receptive to feedback on missed emotional cues after a family meeting ● Discusses well-being concerns as they might affect performance
Level 2 *Lists available resources for personal and professional well-being* *Describes institutional resources that are meant to promote well-being*	● 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 *With assistance, proposes a plan to promote personal and professional well-being* *Recognizes which institutional factors affect well-being*	● 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 *Independently develops a plan to promote personal and professional well-being* *Describes institutional factors that positively and/or negatively affect well-being*	● 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 resident peer group
Level 5 *Creates institutional-level interventions that promote colleagues' well-being* *Describes institutional programs designed to examine systemic contributors to burnout*	● 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 ● Establishes a mindfulness program open to all employees
Assessment Models or Tools	● Direct observation

	● Group interview or discussions for team activities ● Individual interview ● Institutional online training modules ● Self-assessment and personal learning plan
Curriculum Mapping	●
Notes or Resources	● This subcompetency is not intended to evaluate a resident's well-being, but to ensure each resident has the fundamental knowledge of factors that impact well-being, the mechanisms by which those factors impact well-being, and available resources and tools to improve well-being. ● ACGME. "Well-Being Tools and Resources." https://dl.acgme.org/pages/well-being-tools-resources. Accessed 2022. ● American Board of Pediatrics. "Entrustable Professional Activities for Subspecialties." https://www.abp.org/content/entrustable-professional-activities-subspecialties. Accessed 2022. ● American Board of Pediatrics. "Medical Professionalism." https://www.abp.org/content/medical-professionalism. Accessed 2020. ● Hicks PJ, Schumacher D, Guralnick S, Carraccio C, Burke AE. Domain of competence: personal and professional development. *Acad Pediatr*. 2014;14(2 Suppl):S80-97. https://linkinghub.elsevier.com/retrieve/pii/S1876-2859(13)00332-X. 2020. ● Local resources, including Employee Assistance Plan (EAP)

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**
Level 1 *Communicates with patients and their families in an understandable and respectful manner*	● Introduces self and faculty member, identifies patient and others in the room, and engages all parties in health care discussion
Provides timely updates to patients and patients' families	● Provides updates to the family after an unanticipated ICU admission
Level 2 *Customizes communication in the setting of personal biases and barriers with patients and patients' families*	● Avoids medical jargon and restates patient perspective when discussing general versus regional anesthesia
Actively listens to patients and patients' families to elicit patient preferences and expectations	● Responds to questions regarding the risks of regional anesthesia techniques
Level 3 *Explains complex and difficult information to patients and patients' families*	● Acknowledges patient's request for a do not resuscitate order in the operating room and explains the options
Uses shared decision making to make a personalized care plan	● Following a discussion of the risks and benefits of regional anesthesia, elicits patient and family preference regarding regional versus general anesthesia; documents discussion and preference in emergency medical room
Level 4 *Facilitates difficult discussions with patients and patients' families*	● Explains the risks of neurocognitive dysfunction to parents of a neonate prior to administration of anesthesia
Effectively negotiates and manages conflict among patients, patients' families, and the health care team	● Explains to a patient and their family medical reasoning behind canceling their procedure ● Explains causes and treatment of a corneal abrasion during post-operative visits
Level 5 *Mentors others in the facilitation of crucial conversations*	● Leads a discussion group on personal experience of moral distress
Mentors others in conflict resolution	● Develops a residency curriculum on health care disparities which addresses unconscious bias ● Serves on a hospital bioethics committee
Assessment Models or Tools	● Direct observation ● OSCE

	● Self-assessment including self-reflection exercises ● Standardized patients
Curriculum Mapping	●
Notes or Resources	● Laidlaw A, Hart J. Communication skills: an essential component of medical curricula. Part I: Assessment of clinical communication: AMEE Guide No. 51. *Med Teach*. 2011;33(1):6-8. https://www.tandfonline.com/doi/full/10.3109/0142159X.2011.531170. 2020. ● Makoul G. Essential elements of communication in medical encounters: The Kalamazoo consensus statement. *Acad Med*. 2001;76:390-393. https://pubmed.ncbi.nlm.nih.gov/11299158/. 2020. ● Makoul G. The SEGUE Framework for teaching and assessing communication skills. *Patient Educ Couns*. 2001;45(1):23-34. https://pubmed.ncbi.nlm.nih.gov/11602365/ 2020. ● 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://bmcmededuc.biomedcentral.com/articles/10.1186/1472-6920-9-1. 2020.

Interpersonal and Communication Skills 2: Interprofessional and Team Communication	
Overall Intent: To effectively communicate with the health care team, including consultants, in both straightforward and complex situations	

Milestones	Examples
Level 1 *Respectfully requests or receives consultations* *Uses language that values all members of the health care team* *Respectfully receives feedback from the health care team*	● Consults cardiology for a patient with a history of angina and limited exercise capacity, relays the diagnosis and respectfully requests a pharmacological stress test ● Receives an acute pain consult request, 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 to the patient
Level 2 *Clearly, concisely and promptly requests or responds to a consultation* *Communicates information effectively with all health care team members* *Solicits feedback on performance as a member of the health care team*	● Communicates pre-operative plans with the attending anesthesiologist concisely in a timely manner ● Communicates intra-operative events to the surgical staff and attending anesthesiologist clearly and concisely in an organized and timely manner ● Conducts post-operative visits and discusses patient complications with supervising attending while reflecting on personal role in the patient's care
Level 3 *Uses closed-loop communication to verify understanding* *Adapts communication style to fit team needs* *Communicates concerns and provides feedback to peers and learners*	● While leading an intra-operative 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 medical student during IV insertion
Level 4 *Coordinates recommendations from different members of the health care team to optimize patient care* *Maintains effective communication in crisis situations*	● Collaborates with surgical colleagues to plan for post-operative analgesia in a patient on buprenorphine ● Explains rationale for institution of the massive transfusion protocol during intra-operative hemorrhage

Communicates constructive feedback to superiors	● Alerts to a breech in sterility for a line placement by a faculty member ● Cautions faculty member about an imminent medication administration error
Level 5 *Role models flexible communication strategies that value input from all health care team members, resolving conflict when needed*	● Mediates a conflict resolution between different members of the health care team
Leads an after-event debrief of the health care team	● Leads a post-code team debriefing
Facilitates regular health care team-based feedback in complex situations	● Prompts a post-case sign-out after a case requiring a massive transfusion and ICU care
Assessment Models or Tools	● Direct observation ● Global assessment ● Medical record (chart) audit ● Multisource feedback ● Simulation
Curriculum Mapping	●
Notes or Resources	● AHRQ. Curriculum Materials. https://www.ahrq.gov/teamstepps/curriculum-materials.html. 2020. ● Tait AR, Teig MK, Voepel-Lewis T. Informed consent for anesthesia: A review of practice and startegies for optimizing the consent process. *Can J Anaesth*. 2014;61(9):832-842. https://pubmed.ncbi.nlm.nih.gov/24898765/. 2020. ● Dehon E, Simpson K, Fowler D, Jones A. Development of the faculty 360. *MedEdPORTAL*. 2015;11:10174. https://www.mededportal.org/publication/10174/. 2020. ● Green M, Parrott T, Cook G., Improving your communication skills. *BMJ*. 2012;344:e357. https://www.bmj.com/content/344/bmj.e357. 2020. ● Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: a review with suggestions for implementation. *Med Teach*. 2013;35(5):395-403. https://www.tandfonline.com/doi/full/10.3109/0142159X.2013.769677. 2020. ● Roth CG, Eldin KW, Padmanabhan V, Freidman EM. Twelve tips for the introduction of emotional intelligence in medical education. *Med Teach*. 2018:1-4. https://www.tandfonline.com/doi/full/10.1080/0142159X.2018.1481499. 2020.

Interpersonal and Communication Skills 3: Communication within Health Care Systems	
Overall Intent: To effectively communicate using a variety of methods	

Milestones	Examples
Level 1 *Accurately records information in the patient record; demonstrates judicious use of documentation shortcuts*	● Documentation is accurate but may include extraneous information
Safeguards patient personal health information	● Avoids talking about patients in the elevator, public spaces, or on social media
Communicates through appropriate channels as required by institutional policy	● Identifies institutional and departmental communication hierarchy for concerns and safety issues ● Only uses secure communication modalities when sharing protected health information
Level 2 *Accurately records information in the anesthetic record for basic cases*	● Completes all components of the intra-operative record in a timely manner
Documents required data in formats specified by institutional policy	● Completes intubation note for an urgent ICU intubation using the appropriate template and correct elements ● Correctly uses the institutional system to file a report of a safety issue.
Respectfully communicates concerns about the system	● Recognizes that a communication breakdown has happened and respectfully brings the breakdown to the attention of the chief resident or faculty member
Level 3 *Accurately records information in the anesthetic record and communicates complex care decisions for complex cases*	● Documents critical event notes in the medical record concisely and in a timely manner
Appropriately selects direct and indirect forms of communication based on context	● Follows up with a patient in person regarding a difficult intubation ● Provides a written handout on risks of sugammadex and contraception
Respectfully communicates concerns about the system and contributes to solutions	● Knows when to direct concerns locally, departmentally, or institutionally, ie., appropriate escalation
Level 4 *Uses medical record functionality to highlight challenges in anesthetic care to facilitate future peri-operative management*	● Creates consistently accurate, organized, and concise documentation, frequently incorporating anticipatory guidance
Models exemplary written or verbal communication	● Creates exemplary pre-operative assessments that are used by a more senior resident to teach others

Uses appropriate channels to offer clear and constructive suggestions to improve the system	● Talks directly to an emergency department physician (or surgical colleague) about breakdowns in communication in order to prevent recurrence
Level 5 *Explores innovative uses of the medical record to facilitate peri-operative management* *Guides departmental or institutional policies and procedures around communication* *Initiates difficult conversations with appropriate stakeholders to improve the system*	● Leads a task force established by the hospital QI committee to develop a plan to improve house staff hand-offs ● Actively participates in a committee to develop a pandemic disaster response plan ● Contacts hospital leadership to discuss ways to improve resident well-being
Assessment Models or Tools	● Direct observation ● Medical record (chart) audit ● Multisource feedback ● OSCE ● Simulation
Curriculum Mapping	●
Notes or Resources	● APSF. Improving Post Anesthesia Care Unit (PACU) Handoff By Implementing a Succinct Checklist. https://lhatrustfunds.com/wp-content/uploads/2015/07/PACU-handoff.pdf. 2020. ● Bierman JA, Hufmeyer KK, Liss DT, Weaver AC, Heiman HL. Promoting responsible electronic documentation: validity evidence for a checklist to assess progress notes in the electronic health record. *Teach Learn Med.* 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. 2020. ● Haig KM, Sutton S, Whittington J. SBAR: a shared mental model for improving communication between clinicians. *Jt Comm J Qual Patient Saf.* 2006;32(3):167-175. https://www.jointcommissionjournal.com/article/S1553-7250(06)32022-3/fulltext. 2020. ● Starmer AJ, et al. I-pass, a mnemonic to standardize verbal handoffs. *Pediatrics.* 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. 2020.

In an effort to aid programs in the transition to using the new version of the Milestones, the original Milestones 1.0 have been mapped to the new Milestones 2.0. Also indicated below are where the subcompetencies are similar between versions. These are not necessarily exact matches but are areas that include some of the same elements. Note that 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: Pre-anesthetic Patient Evaluation, Assessment, and Preparation	PC1: Pre-Anesthetic Evaluation
PC2: Anesthetic Plan and Conduct	PC2: Peri-Operative Care and Management PC4: Intra-Operative Care
PC3: Peri-procedural pain management	PC3: Application and Interpretation of Monitors
PC4: Management of peri-anesthetic complications	PC8: Post-Operative Care
PC5: Crisis management	PC7: Situational Awareness and Crisis Management
PC6: Triage and management of the critically ill patient in a non-operative setting	PC8: Post-Operative Care PC9: Critical Care
PC7: Acute, chronic, and cancer-related pain consultation and management	PC2: Peri-Operative Care and Management PC6: Point of Care Ultrasound
PC8: Technical skills: Airway management	PC5: Airway Management
PC9: Technical skills: Use and Interpretation of Monitoring and Equipment	PC3: Application and Interpretation of Monitors
PC10: Technical skills: Regional anesthesia	PC10: Regional (Peripheral and Neuraxial) Anesthesia
MK1: Knowledge of biomedical, clinical, epidemiological, and social-behavioral sciences as outlined in the American Board of Anesthesiology Content Outline	MK1: Foundational Knowledge
No match	MK2: Clinical Reasoning
SBP1: Coordination of patient care within the health care system	SBP2: System Navigation for Patient-Centered Care
SBP2: Patient Safety and Quality Improvement	SBP1: Patient Safety and Quality Improvement
No match	SBP3: Physician Role in Health Care Systems

PBLI1: Incorporation of quality improvement and patient safety initiatives into personal practice	SBP1: Patient Safety and Quality Improvement
PBLI2: Analysis of practice to identify areas in need of improvement	PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI3: Self-directed learning	PBLI1: Evidence-Based and Informed Practice PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI4: Education of patient, families, students, residents, and other health professionals	No match
PROF1: Responsibility to patients, families, and society	PROF1: Professional Behavior and Ethical Principles
PROF2: Honesty, integrity, and ethical behavior	PROF1: Professional Behavior and Ethical Principles
PROF3: Commitment to institution, department, and colleagues	PROF2: Accountability/ Conscientiousness
PROF4: Receiving and giving feedback	PBLI2: Reflective Practice and Commitment to Personal Growth
PROF5: Responsibility to maintain personal emotional, physical, and mental health	PROF2: Accountability/ Conscientiousness PROF3: Self-Awareness and Well-Being
ICS1: Communication with patients and families	ICS1: Patient and Family-Centered Communication
ICS2: Communication with other professionals	ICS2: Interprofessional and Team Communication
ICS3: Team and leadership skills	ICS2: Interprofessional and Team Communication
No match	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

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