Supplemental Guide:
Maternal-Fetal Medicine
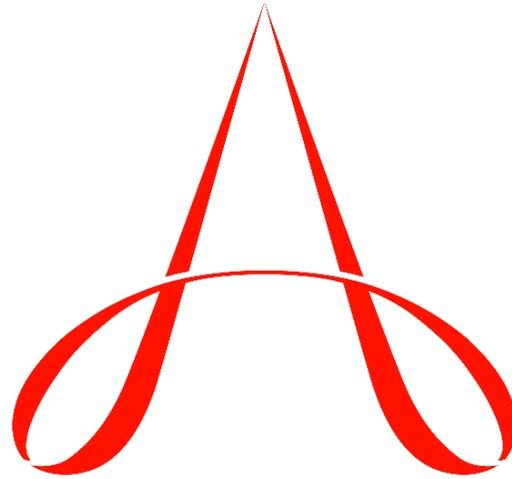
ACGME

April 2022

TABLE OF CONTENTS

Milestones Supplemental Guide

This document provides additional guidance and examples for the Maternal-Fetal Medicine 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: Labor and Delivery
Overall Intent: To oversee the management of complex maternal and fetal cases in labor and delivery unit

Milestones	Examples
Level 1 *Manages routine peripartum care for maternal-fetal medicine patients* *Identifies patients who need complex obstetrical procedures*	• Manages postpartum hemorrhage • Manages acute hypertensive crisis • Recognizes the need to transfer septic patient to intensive care units
Level 2 *Performs initial consultation for complex medical and surgical procedures for maternal-fetal medicine patients on labor and delivery* *Assists in complex obstetrical procedures*	• Completes initial consultation for periviable preterm premature rupture of membranes (PPROM) • Completes initial consultation for pre-term preeclampsia • Discusses plan of care with patient for cesarean hysterectomy • Assists in cesarean hysterectomy
Level 3 *Develops the management plan for complex medical and surgical procedures for maternal-fetal medicine patients on labor and delivery* *Performs key components of complex obstetrical procedures*	• Develops management plan for periviable PPROM • Develops management plan for preeclampsia with severe features with oliguria and pulmonary edema • Develops management and determines delivery timing for cesarean hysterectomy for suspected accrete • Identifies the need for hysterectomy in setting of postpartum hemorrhage and can complete initial steps
Level 4 *Manages the interdisciplinary care for complex medical and surgical procedures for maternal-fetal medicine patients on labor delivery* *Proficiently performs complex obstetrical procedures and manages complications*	• Develops multidisciplinary plan of care for complex maternal heart disease patient in labor • Independently performs cesarean hysterectomy for uterine atony or placenta accreta without percreta • Independently performs exam-indicated cerclage
Level 5 *Implements novel protocols for interdisciplinary management for complex medical and surgical procedures for maternal-fetal medicine patients on labor delivery*	• Trialing new devices, innovative procedures • Uses evidence-based medicine to develop labor and delivery plans for complex maternal disease • Develops delivery plan for conjoined twin gestation

Applies an evidence-based approach to innovative and complex obstetrical procedures	• Develops multidisciplinary plan of care for laboring patient with severe COVID-19
Assessment Models or Tools	• Direct observation • Multisource feedback • Simulations
Curriculum Mapping	•
Notes or Resources	• Cunningham F, Leveno KJ, Bloom SL, Dashe JS, Hoffman BL, Casey BM, Spong CY. Eds. 2018. *Williams Obstetrics*, 25th edition. McGraw-Hill Education. • Lockwood, C., Moore, T., Copel,J. ,Silver, R. , Resnik, R., Greene, M. *Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice*. 8th edition. Elsevier, 2018. • Society for Maternal-Fetal Medicine (SMFM) publications

Patient Care 2: Sonographic Diagnosis and Procedures	
Overall Intent: To perform and interpret maternal/fetal obstetric ultrasounds, counsel patients about the clinical findings, and perform ultrasound guided maternal and fetal procedures	
Milestones	**Examples**
Level 1 *Identifies normal and abnormal anatomy on sonography*	• Correctly and completely identifies criteria and landmarks for structures involved in the performance of a sonographic fetal anatomic survey • Articulates what fetal abnormalities are ruled out be selected normal features or structures on components of a fetal anatomic survey • Develops a curated library of normal and abnormal fetal findings on ultrasound
Selects appropriate candidates for prenatal diagnosis or therapeutic procedures	• Completely lists/modifies equipment needed to perform a genetic or therapeutic amniocentesis based on maternal and fetal characteristics • Articulates accurately the criteria for an ultrasound guided needle procedure in relation to the procedural indication amniocenteses/chorionic villus sampling • Reads and interprets level 1 ultrasound
Level 2 *Performs and interprets sonography for cervical length and standard sonography for complete fetal anatomic survey in routine patient situations*	• Images and measures the cervix and lower uterine segment using a transabdominal or transvaginal technique • Understands the factors and how they will affect the measurement of a cervical length • Insonates fetal anatomic structures from multiple positions on the maternal abdomen and optimize the final sonographic image
Performs routine prenatal diagnosis or therapeutic procedures	• Accurately provides the risks, benefits, and alternatives in providing informed consent for a routine genetic amniocentesis • Efficiently performs a routine genetic amniocentesis procedure • Uses standards (e.g., cervical length education and review (CLEAR) criteria) to demonstrate accurate cervical length assessment • Counsels patients regarding chorionic villus sampling results and makes recommendations for further testing
Level 3 *Performs and interprets sonography for cervical length and standard sonography for complete fetal anatomic survey in complex patient situations*	• Diagnoses and counsels a patient with significant cervical funneling or prolapse of the membranes through the cervix • Diagnoses and counsels a patient with open neural tube defect • Efficiently performs a fetal ultrasound to differentiate between a fetal omphalocele and fetal gastroschisis

Performs routine prenatal diagnosis or therapeutic procedures in complex patient situations	• Appropriately selects candidates for and efficiently performs a transabdominal chorionic villus sampling • Performs a dye study for evaluation of premature rupture of membranes (PROM) in a twin gestation • Performs middle cerebral arterial doppler for anemia
Level 4 *Proficiently performs detailed fetal assessment and interprets more complex findings*	• Performs and interprets a sonographic skeletal survey to aid in the diagnosis of the appropriate diagnosis of a fetus with skeletal dysplasia • Performs detailed anatomic survey and interprets the possible etiology of fetal hydrocephalus
Proficiently performs complex prenatal diagnosis or therapeutic procedures	• Appropriately selects candidates for and efficiently performs a transcervical chorionic villus sampling • Plans and efficiently performs a fetal in-utero cystocentesis or thoracocentesis • Performs a transabdominal amnioinfusion to perform genetic amniocentesis in a case of anhydramnios •
Level 5 *Proficiently performs advanced ultrasound techniques*	• Efficiently performs and interprets a fetal echocardiogram leading to diagnosis of a complex cardiac lesion • Performs neurosonography for neuronal migration disorders
Proficiently performs advanced fetal therapeutic procedures	• Plan and perform an in-utero stent procedure to drain a pleural effusion • Demonstrates the ability to perform appropriate laser therapy for twin-twin transfusion syndrome • Plans and efficiently performs a fetal tracheal occlusion
Assessment Models or Tools	• Clinical evaluation/direct observation • Global evaluation • Medical record/chart review • Multisource feedback • Oral or written self-reflections • Simulation
Curriculum Mapping	•
Notes or Resources	• American Institute of Ultrasound in Medicine (AIUM), American College of Radiology (ACR), American College of Obstetricians and Gynecologists (ACOG), SMFM, Society of Radiologists in Ultrasound (SRU). AIUM-ACR-ACOG-SMFM-SRU practice parameter for the performance of standard diagnostic obstetric ultrasound examinations. *Journal of*

	Ultrasound in Medicine: Official Journal of the American Institute of Ultrasound in Medicine. Nov;37(11):E13-E24. DOI: 10.1002/jum.14831. PMID: 30308091. • Perinatal Quality Foundation. Cervical Length Education and Review Program. https://clear.perinatalquality.org/. Accessed 2022. • Zubair I, Marcotte MP, Weinstein L, Brost BC. A novel amniocentesis model for learning stereotactic skills. Am J Obstet Gynecol. 2006 Mar;194(3):846-8. doi: 10.1016/j.ajog.2005.08.068. PMID: 16522423.

Patient Care 3: Complications of Pregnancy	
Overall Intent: To consult and manage maternal and fetal pregnancy complications	

Milestones	Examples
Level 1 *Consults and manages care for patients with common comorbidities in pregnancy* *Consults and manages care for patients with common obstetric complications*	• Discusses the risks and management of gestational diabetes with patients and provides recommendations to referring providers • Provides inpatient consultative services for patient admitted with PPROM
Level 2 *Consults and develops care plans for patients with complex medical comorbidities in pregnancy* *Consults and develops care plan for patients with complex obstetric complications*	• Counsels patients with congenital heart disease on pregnancy risks/management • Provides consultation, referral to surgical center, and management of a patient with twin-twin transfusion syndrome
Level 3 *Consults and manages care for patients with complex medical comorbidities in pregnancy* *Consults and manages care for patients with complex obstetric complications*	• Manages care and works in multidisciplinary team to develop treatment plan for pregnant woman with newly diagnosed breast cancer • Provides consultation, and management of a patient with complicated multi-fetal gestation discordant for anomalies or growth
Level 4 *Manages the interdisciplinary care for patients with highly complex medical comorbidities in pregnancy* *Manages the interdisciplinary care for patients with highly complex obstetric complications*	• Co-manages critically ill pregnant patient in intensive care unit (ICU) with COVID-19 • Coordinates multidisciplinary care and manages patients with placenta accreta spectrum
Level 5 *Implements novel protocols for interdisciplinary management for complex medical comorbidities in pregnancy* *Develops innovative evidence-based approaches to care of patients with complex obstetric complications*	• Develops hospital wide protocols and algorithms for care of medically complex patients during non-routine situations (e.g., COVID in pregnancy) • Develops a multidisciplinary algorithm for the management of primary pulmonary hypertension • Develops a multidisciplinary algorithm for the management of amniotic fluid embolism
Assessment Models or Tools	• Direct observation • Global/rotational evaluations • Medical record (chart) review

	• Multisource feedback
Curriculum Mapping	•
Notes or Resources	• ACOG practice bulletins • Lockwood C, Moore T, Copel J, Silver R, Resnik R, Greene M. *Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice*. 8th edition. Netherlands, Amsterdam: Elsevier; 2018. • Foley MR, Strong Jr TH, Garite TJ. eds. *Obstetric Intensive Care Manual,* 5th edition. McGraw Hill, 2018. https://obgyn.mhmedical.com/content.aspx?bookid=2379&sectionid=185956317 • SMFM webinar series

Patient Care 4: Complex Genetic Counseling	
Overall Intent: To understand and convey the reasoning for and possible results of genetic testing	
Milestones	**Examples**
Level 1 *Participates in pre-test counseling*	• Observes others providing pre- and post-testing counseling to patients and families with a diagnosis of cystic fibrosis
Participates in post-test counseling	• Demonstrates ability to obtain and document a complete pedigree
Level 2 *Explains the rationale for the recommended testing*	• Explains to patient/family why chromosomal microarray is a first-tier test for genetic evaluation of fetal anomalies • Explains strengths and limitations of cell free DNA testing for evaluation of fetal sex chromosomes
Explains the results of the test	• Communicates that a test was diagnostic or non-diagnostic to the patient/family
Level 3 *Conveys the impact and limitations of disorder-specific targeted testing while obtaining informed consent*	• Explains strengths and limitations of non-invasive prenatal screening (NIPS) for evaluation of intellectual disabilities
Conveys the impact and limitations of diagnostic and non-diagnostic results	• Communicates the difference between screening and diagnostic testing in the context of non-diagnostic result
Level 4 *Clearly conveys the impact and limitations of complex untargeted testing while obtaining informed consent*	• Provides appropriate pre-test counseling regarding expanded carrier screening panels
Conveys the impact and limitations of unexpected and ambiguous results	• Effectively communicates possibility of identifying unexpected results including consanguinity, misattributed parentage, and/or variant of uncertain significance
Level 5 *Participates in the development of professional practice guidelines regarding testing and return of results*	• Participates in ACOG, SMFM, or other national committee writing guidelines on genetic testing in pregnancy or preconception
Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Multisource feedback • Resident self-reflection
Curriculum Mapping	•
Notes or Resources	• ACOG Committee Opinion 690: carrier screening in the age of genomic medicine; March 2017.

	• ACOG Committee Opinion 693: counseling about genetic testing and communication of genetic test results, April 2017 • ACOG Practice Bulletin 162: Prenatal diagnostic testing for genetic disorders, May 2016. • ACOG Practice Bulletin 226: Screening for fetal chromosomal abnormalities, October 2020.

Patient Care 5: Critical Care	
Overall Intent: To apply understanding of the unique physiology of pregnancy in the context of critical illness	

Milestones	Examples
Level 1 *Recognizes risk factors that can lead to critical illness in an obstetric patient and formulates an initial differential diagnosis; recognizes initial signs/symptoms of a critically ill patient (vital signs, lab abnormalities, etc.) and asks for assistance in a timely fashion*	• Considers imitators of severe preeclampsia for patient with previable new onset of severe hypertension • Discusses the signs and symptoms of sepsis in the obstetric patient • Provides a differential diagnosis for pulmonary edema in a pregnant patient with known congenital cardiac disease
Level 2 *Manages and initiates timely treatment for critically ill obstetric patient, including recognizing when transfer to the intensive care unit (ICU) or another service is most appropriate*	• Promptly starts intravenous (IV) fluids and appropriate antibiotics for a patient with suspected urosepsis • Uses the Surviving Sepsis Campaign guidance to initiate prompt management of the septic pregnant patient
Level 3 *With assistance, serves as a consultant to the ICU care team for the management of an obstetric critical care patient*	• Advises ICU team in alternative agents for treatment of severe hypertension including indications for nicardipine drip • Provides consultation to an ICU team regarding physiologic changes in pregnancy that will affect cardiopulmonary parameters
Level 4 *Serves as a consultant to the ICU care team and assists in the management of an obstetric critical care patient*	• Consults to the ICU for patient with pulmonary hypertension • Manages the obstetric patient with decompensated heart failure in the setting of primary pulmonary hypertension • Arranges admission to the cardiac ICU for a pregnant patient with Marfan syndrome and aortic root dilatation
Level 5 *Leads the interdisciplinary care team in the management of an obstetric critical care patient*	• Leads a multidisciplinary discussion and coordinates delivery timing and logistics for an intubated patient with COVID-19 pneumonia • Manages a cardiac arrest in a pregnant patient with a suspected amniotic fluid embolism
Assessment Models or Tools	• Direct observation • Debriefing records • Interdisciplinary reviews
Curriculum Mapping	•
Notes or Resources	• Phelan JP, Pacheco LD, Foley MR, Saade GR, Dildy GA, Belfort MA. *Critical Care Obstetrics,* 6th edition. Wiley; 2018. • SMFM Consult series no. 47: sepsis during pregnancy and the puerperium. 2019.

Medical Knowledge 1: Medical Complications of Pregnancy	
Overall Intent: To demonstrate understanding of pathophysiology in the context of pregnancy and evidence-based management	

Milestones	Examples
Level 1 *Demonstrates knowledge of the impact of physiologic changes of pregnancy on common medical comorbidities and knowledge of treatment modalities*	• Interprets pulmonary function test report for a patient with asthma • Discusses renal physiology changes in pregnancy and the impact on renal disease
Level 2 *Demonstrates knowledge of complex medical comorbidities*	• Discusses the risks and benefits of oral hypoglycemic agents in the treatment of type 2 diabetes in pregnancy • Performs a preconception consult for a patient who has undergone liver transplantation, with a focus on pharmacologic therapy and pregnancy outcomes
Level 3 *Demonstrates knowledge of treatment modalities of complex medical comorbidities in pregnancy*	• Leads a resident and medical student lecture on respiratory disease in pregnancy and ventilator settings
Level 4 *Applies knowledge of complex medical comorbidities and treatment modalities, including critical care*	• Applies knowledge of acute respiratory decompensation secondary to management of a pregnant patient influenza pneumonia
Level 5 *Develops and disseminates knowledge regarding complex medical comorbidities and treatment modalities*	• Develops and implements a postpartum hemorrhage risk stratification protocol • Develops an algorithm embedded in the electronic medical record for the management of sepsis in the pregnant patient
Assessment Models or Tools	• Direct observation • Multisource feedback • Oral and written examination
Curriculum Mapping	•
Notes or Resources	• Cunningham, FG et al. *Williams Obstetrics*. 25th edition. New York: McGraw-Hill Education; 2018. • Landon, MB et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies*. 8th edition. Philadelphia, PA: Elsevier; 2021. • Lockwood C et al. *Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice*. 8th edition. Philadelphia: Saunders/Elsevier; 2018. • SMFM practice guidelines • SMFM webinar series •

Medical Knowledge 2: Obstetrical Complications (Antepartum, Intrapartum, Postpartum)
Overall Intent: To understand the complications that can arise as a result of pregnancy as well as treatment approaches

Milestones	Examples
Level 1 *Demonstrates knowledge of common obstetric complications and treatment modalities*	• Describes current guidelines for managing preeclampsia in the outpatient setting • Lists potential interventions for obstetric hemorrhage, including contraindications
Level 2 *Demonstrates knowledge of complex obstetric complications*	• Provides differential diagnosis for cardiac arrest in the intrapartum period • Lists potential obstetrical complications for a patient with cystic fibrosis
Level 3 *Demonstrates knowledge of treatment modalities of complex obstetric complications*	• Understands treatment options for a patient with previable cervical shortening and twin gestation • Discusses pharmacologic options for a patient with venous thromboembolism and history of heparin-induced thrombocytopenia
Level 4 *Applies knowledge of complex obstetric complications and treatment modalities, including interdisciplinary care*	• Counsels a patient presenting with preterm labor in the periviable period including role of neonatology • Describes antepartum, intrapartum, and postpartum management of a patient with pulmonary artery hypertension and involves colleagues from pulmonology, cardiology, critical care, and neonatology
Level 5 *Develops and disseminates knowledge regarding obstetric complications and treatment modalities*	• Publishes peer-reviewed literature regarding management of obstetric complications • Leads interdisciplinary education regarding management of hypertensive emergencies
Assessment Models or Tools	• Direct observation • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• Cunningham, FG et al. *Williams Obstetrics*. 25th edition. New York: McGraw-Hill Education; 2018. • Landon, MB et al. *Gabbe's Obstetrics: Normal and Problem Pregnancies*. 8th edition. Philadelphia: Elsevier; 2021. • Lockwood C et al. *Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice*. 8th edition. Philadelphia: Saunders/Elsevier; 2018. • SMFM webinar series

Medical Knowledge 3: Genetic Principles	
Overall Intent: To understand and interpret genetic principles and use that information to aid in shared decision making	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of basic genetic principles, genetic screening, and teratogens* *Demonstrates knowledge of basic genetic screening and diagnostic tests*	• Obtains a genetic history and performs a three-generation pedigree in a patient with advanced maternal age • Performs preconception counseling for a patient on anti-epileptic medication • Counsels patients on different types of aneuploidy screening and diagnostic testing options with interpretation of results
Level 2 *Demonstrates knowledge of advanced genetic principles and uncommon hereditary syndromes* *Applies knowledge of basic genetic screening and diagnostic testing*	• Counsel patients on Mendelian and non-Mendelian patterns of inheritance • Counsels patients regarding diagnostic options based on screening results
Level 3 *Applies knowledge of basic genetic principles, genetic screening, and teratogens* *Demonstrates knowledge of advanced genetic screening and diagnostic testing*	• Interprets parental carrier screening in a patient with cystic fibrosis • Counsels patient about teratogenic exposure during pregnancy and proposes appropriate follow-up testing or evaluation • Interprets discrepancy in phenotypic and genotypic fetal sex on cell-free deoxyribonucleic acid (DNA)
Level 4 *Applies knowledge of advanced genetic principles to provide comprehensive counselling to patients and their families* *Applies knowledge of advanced genetic screening and diagnostic testing principles to optimize perinatal outcomes*	• Interprets atypical results in cell-free DNA • Understands the need for advanced genetic panels based on ultrasound findings
Level 5 *Develops innovative concepts and theories regarding genetic principles* *Develops genetic testing guidelines and principles to optimize perinatal outcomes on a regional or national level*	• Speaks nationally on genetic principles • Speaks nationally on developing new/enhanced genetic testing • Writes and recognized for above created testing/enhancements
Assessment Models or Tools	• Clinical evaluations/direct observation • Medical record (chart) review

	• Multisource feedback
Curriculum Mapping	•

Notes or Resources	• ABOG expects physicians to:
	  • 38a. Obtain a genetic history and perform a three-generation pedigree, perform preconception genetic counseling, and counsel patients on Mendelian patterns of inheritance (e.g., autosomal dominant, autosomal recessive, co-dominant, X-linked recessive, X-linked dominant) and non-Mendelian patterns of inheritance (e.g., trinucleotide repeat disorders, imprinting, uniparental disomy, mitochondrial inheritance, germline mosaicism, multifactorial and polygenic inheritance)
	  • b. Counsel patients on benefits and limitations of preimplantation genetic screening (PGS)/pre-implantation genetic diagnosis (PGD)
	  • c. Counsel patients on and perform expanded and ethnicity-based carrier screening
	  • d. Counsel patients on different methods of aneuploidy screening and interpret results
	  • e. Counsel patients on prenatal testing (e.g., fetal karyotype, chromosomal microarray, biochemical and molecular tests, whole exome sequencing)
	• Adam MP (ed). *Gene Reviews*. Seattle: University of Washington; 2021. https://www.ncbi.nlm.nih.gov/books/NBK1116/
	• National Organization for Rare Diseases https://rarediseases.org/
	• Norton M, Kuller J, Dugoff L. *Perinatal Genetics*. Philadelphia: Elsevier; 2019.
	• Online Mendelian Inheritance in Man (OMIM). www.omim.org

Medical Knowledge 4: Prenatal Imaging and Diagnosis	
Overall Intent: To understand prenatal imaging and prenatal diagnosis and apply this knowledge in patient counseling	

Milestones	Examples
Level 1 *Demonstrates knowledge, including bioeffects and safety, of imaging modalities used to evaluate obstetric patients*	• Understands basic principles of obstetric ultrasound • Counsels patients appropriately on safety and bioeffects of imaging in pregnancy including x-ray, magnetic resonance imaging (MRI), and computerized tomography (CT) ultrasound
Demonstrates knowledge of normal fetal anatomy, placentation, and maternal pelvic anatomy	• Identifies normal anatomy at detailed anatomic survey • Distinguishes chorionicity, amnionicity, and normal placentation
Level 2 *Demonstrates knowledge of indications and complications of prenatal screening and diagnostic procedures*	• Understands indications and complications of procedures including amniocentesis, chorionic villus sampling, percutaneous umbilical cord blood sampling, and fetal surgery
Demonstrates knowledge of abnormal fetal anatomy, growth, placentation, and maternal pelvic anatomy	• Identifies fetal anomalies such as a congenital heart defect • Recognizes sonographic features of placenta accreta spectrum
Level 3 *Demonstrates knowledge of indications and interpretation of advanced imaging modalities*	• Interprets abnormal middle cerebral arterial doppler • Identifies and accurately stages twin-to-twin transfusion syndrome
Demonstrates knowledge of management options for specific fetal anomalies, fetal growth abnormalities and abnormal placentation	• Counsels patient regarding diagnosis and implications of fetal growth restriction • Counsels patient regarding implications of lethal fetal conditions such as anencephaly including option for pregnancy termination
Level 4 *Applies knowledge of complex advanced imaging and therapeutic options to develop a comprehensive management plan*	• Coordinates percutaneous umbilical cord blood sampling procedure, demonstrating understanding of all steps • Counsels patient with twin-to-twin transfusion syndrome regarding diagnosis, various management options, and risks
Applies knowledge of specific fetal anomalies, fetal growth abnormalities, and abnormal placentation to develop a comprehensive management plan in collaboration with a multidisciplinary care team	• Provides nuanced counseling regarding diagnosis of severe, early fetal growth restriction and pregnancy management • Leads a multidisciplinary team meeting regarding delivery planning for a patient with suspected placenta percreta

Level 5 *Develops and disseminates innovative concepts and theories regarding advanced prenatal diagnosis and procedures* *Develops and disseminates innovative concepts and theories regarding management options of complex fetal anomalies and abnormal placentation*	• Develops innovative use for ultrasound imaging on labor and delivery • Presents at a National or International Ultrasound Conference • Publishes regarding a novel sonographic features of complex fetal anomalies • Publishes peer-reviewed literature regarding diagnosis of placenta accreta spectrum
Assessment Models or Tools	• Direct observation • Multisource feedback • Oral and written exams
Curriculum Mapping	•
Notes or Resources	• AIUM. https://aium.org/ • Bianchi DW, Crombleholme TM, D'Alton ME, Malone FD. eds. *Fetology: Diagnosis and Management of the Fetal Patient.* 2nd edition. McGraw Hill; 2010. https://obgyn.mhmedical.com/content.aspx?bookid=1306&sectionid=75203590.Lockwood C, Moore T, Copel J, Silver R, Resnik R, Greene M. *Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice.* 8th edition. Philadelphia: Elsevier; 2018. • Perinatology.com. https://www.perinatology.com/. • SMFM. MFM Fellow Lecture Series. https://education.smfm.org/mfm-lecture-series. • SMFM. Publications – Search Results. https://www.smfm.org/publications/search?q%5Bpublication_categories_id_eq%5D=70 • Woodward, PJ. *Diagnostic Imaging: Obstetrics*, 4th edition. Philadelphia, PA: Elsevier; 2021.

Systems-Based Practice 1: Patient Safety	
Overall Intent: To engage in the analysis and management of patient safety events, including relevant communication with patients, families, and health care professionals	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of common patient safety events* *Demonstrates knowledge of how to report patient safety events*	• Lists patient misidentification or medication errors as common patient safety events • Describes how to report errors in the environment
Level 2 *Identifies system factors that lead to patient safety events* *Reports patient safety events through institutional reporting systems (simulated or actual)*	• Acknowledges the lack of hand sanitizer dispensers at each clinical exam room may lead to increased infection rates • Reports lack of hand sanitizer dispenser at each clinical exam room to the medical director
Level 3 *Participates in analysis of patient safety events (simulated or actual)* *Participates in disclosure of patient safety events to patients and their families (simulated or actual)*	• Prepares for morbidity and mortality presentations • Communicates with patients/families about a surgical error through simulation
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)* *Discloses patient safety events to patients and their families (simulated or actual)*	• Correlates patient safety events to patient groups at higher risk, such as race, ethnicity, and non-English-speaking patients, of adverse outcomes • Collaborates with a team to conduct the analysis of a surgical error and can effectively communicate with patients/families about those events
Level 5 *Actively engages teams and processes to modify systems to prevent patient safety events* *Role models or mentors others in the disclosure of patient safety events*	• Assumes a leadership role at the departmental or institutional level for patient safety • Leads a simulation for disclosing patient safety events
Assessment Models or Tools	• Assessment of reflection • Direct observation • E-module multiple choice tests • Global evaluation

	• Multisource feedback • Simulation assessment
Curriculum Mapping	•
Notes or Resources	• Institute of Healthcare Improvement website (http://www.ihi.org/Pages/default.aspx) which includes multiple choice tests, reflective writing samples, and more • Skochelak SE, Hammoud MM, Lomis KD, etc. al; AMA Education Consortium: Health Systems Science. 2nd edition. Elsevier: 2020.

Maternal-Fetal Medicine Supplemental Guide

Systems-Based Practice 2: Quality Improvement (QI)	
Overall Intent: To demonstrate the skills necessary to participate in quality improvement	

Milestones	Examples
Level 1 *Demonstrates knowledge of basic quality improvement methodologies and metrics*	• Describes fishbone tool or Plan Do Study Act (PDSA) cycle
Level 2 *Describes local quality improvement initiatives*	• Summarizes protocols to decrease surgical site infections
Level 3 *Participates in local quality improvement initiatives*	• Participates in project identifying better throughput in labor and delivery or the office
Level 4 *Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project*	• Participates in the completion of a QI project to improve vaccination rates within the practice, including assessing the problem, articulating a broad goal, developing a SMART (Specific, Measurable, Achievable, Relevant, Time-bound) objective plan, and monitoring progress and challenges
Level 5 *Creates, implements, and assesses quality improvement initiatives at the institutional or community level*	• Initiates and completes a QI project to improve county vaccination rates in collaboration with the county health department and shares results with stakeholders
Assessment Models or Tools	• Assessment of reflection • Direct observation • E-module multiple choice tests • Multisource feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• Institute of Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. Note: iIncludes multiple choice tests, reflective writing samples, and more

Systems-Based Practice 3: System Navigation for Patient-Centered Care - Coordination of Care	
Overall Intent: To effectively coordinate care through the navigation of the health care system, including the interdisciplinary team and other care providers	

Milestones	Examples
Level 1 *Demonstrates knowledge of care coordination*	• For a patient with diabetes, identifies the patient's treating care team
Level 2 *Coordinates care of patients in routine clinical situations, effectively using the roles of interprofessional team members*	• Coordinates care with the postpartum patient's interdisciplinary team at the time of discharge from the hospital
Level 3 *Coordinates care of patients in complex clinical situations, effectively using the roles of interprofessional team members*	• Works to coordinate care for a patient with congenital cardiac disease that will ensure follow-up to care after discharge from the hospital
Level 4 *Identifies concerns with current systems and identifies opportunities for improvement*	• During inpatient rotations, leads team members in approaching consultants to review a case of abnormally adherent placenta and arranges multidisciplinary rounds for the team
Level 5 *Analyzes the process of care coordination and leads in the design and implementation of improvements*	• Prompts and leads regularly scheduled interdisciplinary meetings to improve patient outcomes
Assessment Models or Tools	• Direct observation • Global assessment • Medical record (chart) audit • Multisource feedback • 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 • Kaplan KJ. In pursuit of patient-centered care. TissuePathology.com. March 2016. http://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns • Skochelak SE, Hammoud MM, Lomis KD, et al. *AMA Education Consortium: Health Systems Science*. 2nd editon. Elsevier: 2020.

Systems-Based Practice 4: System Navigation for Patient-Centered Care – Transitions of Care	
Overall Intent: To effectively navigate the health care system to provide safe and efficient transitions of care	

Milestones	Examples
Level 1 *Identifies key elements for safe and effective transitions of care and hand-offs*	• Lists the essential components of a standardized sign-out checklist and care transition and hand-offs
Level 2 *Performs safe and effective transitions of care/hand-offs in routine clinical situations*	• Routinely uses a standardized sign-out checklist for a stable patient during night float sign-out
Level 3 *Performs safe and effective transitions of care/hand-offs in complex clinical situations*	• Routinely uses a standardized sign out checklist when transferring a patient to the ICU
Level 4 *Role models and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems, including outpatient settings*	• Prior to going on vacation, proactively informs the covering resident about a plan of care for a pregnant patient who has elevated blood pressure at 36 weeks and has outpatient labs pending
Level 5 *Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes*	• Develops a protocol to improve transitions between levels of care
Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Multisource feedback • Quality metrics and goals mined from electronic health records (EHR) • 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 • Kaplan KJ. In pursuit of patient-centered care. TissuePathology.com. March 2016. http://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns • Skochelak SE, Hammoud MM, Lomis KD, et al. *AMA Education Consortium: Health Systems Science*. 2nd ed. Elsevier: 2020.

Systems-Based Practice 5: Community and Population Health	
Overall Intent: To effectively navigate the health care system to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of population and community health needs and disparities*	• Understands that patients in rural areas may have different needs than urban patients • Identifies differences in maternal mortality based on race
Level 2 *Identifies specific population and community health needs and inequities for their local population*	• Identifies that limited transportation options may be a factor in patients getting to multiple prenatal and ultrasound appointments
Level 3 *Uses local resources effectively to meet the needs of a patient population and community*	• Refers patients to a local pharmacy which provides a sliding fee scale option and prints pharmacy coupons for patients in need
Level 4 *Participates in changing and adapting practice to provide for the needs of specific populations*	• Assists to implement protocols for prescribing naloxone to patients with opioid use disorders • Works with other health care providers to develop an evening clinic for working patients
Level 5 *Leads innovations and advocates for populations and communities with health care inequities*	• Leads development of telehealth consultation and ultrasound services
Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Multisource feedback • Quality metrics and goals mined from EHRs
Curriculum Mapping	•
Notes or Resources	• CDC. Population Health Training in Place Program (PH-TIPP) https://www.cdc.gov/pophealthtraining/whatis.html • Kaplan KJ. In pursuit of patient-centered care. March 2016. http://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns • Skochelak SE, Hammoud MM, Lomis KD, et al. *AMA Education Consortium: Health Systems Science*. 2nd ed. Elsevier. 2020..

Systems-Based Practice 6: Physician Role in Health Care Systems	
Overall Intent: To understand the physician's role in the complex health care system and how to optimize the system to improve patient care and the health system's performance	
Milestones	**Examples**
Level 1 *Identifies key components of the complex health care system (e.g., hospital, skilled nursing facility, finance, personnel, technology)*	• Understands the impact of health plan coverage on prescription drug costs for individual patients • Identifies that patient notes must meet coding requirements
Level 2 *Describes how components of a complex health care system are inter-related, and how this impacts patient care*	• Explains that improving patient satisfaction impacts patient adherence and payment to the health system • Takes into consideration patient's prescription drug coverage when choosing a contraceptive method • Recognizes that appropriate documentation can influence the severity of illness determination upon discharge
Level 3 *Discusses how individual practice affects the broader system (e.g., length of stay, readmission rates, clinical efficiency)*	• Discusses risks and benefits of inpatient versus outpatient fetal monitoring
Level 4 *Manages various components of the complex health care system to provide efficient and effective patient care and transitions of care*	• Works collaboratively to improve patient assistance resources for a patient with human immunodeficiency virus (HIV) and limited resources • Works with a patient navigator for a patient with complex fetal anomalies
Level 5 *Advocates for or leads systems change that enhances high-value, efficient, and effective patient care and transitions of care*	• Works with community or professional organizations to advocate for awareness of postpartum mood disorders • Participates in local or state health initiatives
Assessment Models or Tools	• Direct observation • Medical record (chart) audit • Patient satisfaction data
Curriculum Mapping	•
Notes or Resources	• Agency for Healthcare Research and Quality (AHRQ). The challenges of measuring physician quality. 2016. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/challenges.html. • AHRQ. Major physician performance sets. 2018 https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/measurementsets.html. • American Board of Internal Medicine. QI/PI activities: Practice assessment: Modules that physicians can use to assess clinical practice. 2019. http://www.abim.org/maintenance-of-certification/earning-points/practice-assessment.aspx

- Center for Medicare and Medicaid Services. The merit-based incentive payment system: advancing care information and improvement activities performance categories. 2018. https://www.cms.gov/Medicare/Quality-Payment-Program/Resource-Library/2018-Advancing-Care-information-Fact-Sheet.pdf.
- Center for Medicare and Medicaid Services: MIPS and MACRA. Updated April 2022. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/MACRA-MIPS-and-APMs/MACRA-MIPS-and-APMs.html.
- The Commonwealth Fund. Health system data center. Accessed 2017. http://datacenter.commonwealthfund.org/?_ga=2.110888517.1505146611.1495417431-1811932185.1495417431#ind=1/sc=1
- Dzau VJ, McClellan M, Burke S, et al. Vital directions for health and health care: priorities from a National Academy of Medicine Initiative. March 2016. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/
- The Kaiser Family Foundation. Accessed 2019. www.kff.org.
- The Kaiser Family Foundation: Topic: health reform. Accessed 2019. https://www.kff.org/topic/health-reform/.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice	
Overall Intent: To incorporate evidence and patient values into clinical practice	

Milestones	Examples
Level 1 *Demonstrates how to access and use available evidence and incorporate patient preferences and values to the care of a routine patient*	• Identifies evidence-based guidelines for preeclampsia risk screening at US Preventive Services Task Force (USPSTF) website • Understands how to access and apply fetal growth curves • Uses a smart phone app or electronic resource to obtain information and counsel a patient on immunizations
Level 2 *Articulates clinical questions and elicits patient preferences and values to guide evidence-based care, with guidance from other health care team members*	• Helps patient balance preferences and risks considering chosen mode of delivery in a pregnant patient with a history of cesarean section • Understands and appropriately uses clinical practice guidelines in making patient care decisions while eliciting patient preferences • Discusses the different modalities for genetic screening for an advanced maternal age patient in the context of patient desires and values
Level 3 *With minimal guidance, locates and applies the best available evidence, integrated with patient preference, to the care of complex patients*	• Obtains, discusses, and applies evidence for the treatment of a patient with a complex fetal cardiac anomaly and coexisting hypertension or obesity • In a patient with systemic lupus erythematosus, identifies and discusses potential contraception options, and solicits patient perspective • Searches and incorporates available evidence and patient's preferences to determine best treatment plan for cholestasis of pregnancy
Level 4 *Critically appraises and applies evidence, even in the face of uncertainty and conflicting evidence, to guide care tailored to the individual patient*	• Accesses the primary literature to identify management options for a pregnant patient with primary pulmonary hypertension who desires to continue a pregnancy • Searches the literature to identify therapeutic options for a pregnant patient with breast cancer • Reviews and incorporates the rapidly changing guidelines for COVID-19 management in the critically ill pregnant patient
Level 5 *Coaches others to critically appraise and apply evidence for the care of complex patients, and/or participates in the development of guidelines*	• Leads clinical teaching on application of best practices in critical appraisal of sepsis criteria for pregnant patients • As part of a team, develops a standard induction protocol for second trimester induction of labor or a standardized approach for stillbirth • Develops simulation protocols for obstetric hemorrhage management
Assessment Models or Tools	• Direct observation/clinical evaluations • Fresno test • Oral examination • Journal club evaluation

	• Presentation evaluation (rounds or patient care conferences)
Curriculum Mapping	•
Notes or Resources	• Academic journal submission guidelines • ACOG Committee Opinion 792: Clinical guidelines and standardization of practice to improve practice https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2019/10/clinical-guidelines-and-standardization-of-practice-to-improve-outcomes • Council on Resident Education in Obstetrics and Gynecology Journal Club Assessment tool. https://www.acog.org/-/media/project/acog/acogorg/files/creog/milestones-journal-club-assessment.docx?la=en&hash=E2E284E59639C04EF8F526A0CB97A699 • Institutional Review Board (IRB) guidelines National Institutes of Health. Grants and Funding: Write Your Application. Updated July 14, 2020. https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm • US National Library of Medicine. PubMed® Online Training. Accessed 2018. https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth	
Overall Intent: To seek clinical performance information with the intent to improve care; reflects on all domains of practice, personal interactions, and behaviors, and that impact on colleagues and patients (reflective mindfulness); develop clear objectives and goals for improvement in a learning plan	

Milestones	Examples
Level 1 *Identifies gap(s) between expectations and actual performance* *Establishes goals for personal and professional development*	• Incorporates evaluations from nurses, patients, peers, and faculty members to identify opportunities for improvement • Completes a literature review prior to patient encounters • Sets a personal practice goal of documenting a detailed pedigree for patients with fetal anomalies
Level 2 *Analyzes and reflects on the factors that contribute to gap(s) between expectations and actual performance* *Identifies opportunities for performance improvement; designs a learning plan*	• Integrates feedback to adjust the documentation of genetic pedigrees or postpartum screening • When prompted, develops individual education plan to improve their evaluation of von Willebrand disease in pregnancy • Identifies specific knowledge base deficits and develops a detailed, structured reading plan over a six-month period
Level 3 *Institutes behavioral change(s) to narrow the gap(s) between expectations and actual performance* *Integrates practice data and feedback with humility to implement a learning plan*	• Using web-based resources, creates a personal curriculum to improve evaluation of fetal cardiac anatomy • Does a chart audit to determine the percent of patients with fetal anomalies that underwent a detailed pedigree
Level 4 *Continuously reflects on remaining gaps and institutes behavioral adjustments to narrow them* *Uses performance data to measure the effectiveness of the learning plan and adapts when necessary*	• Solicits patient feedback on newly implemented screening tools • 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 members • Completes a quarterly chart audit to ensure documentation of detailed family pedigrees
Level 5 *Coaches others on reflective practice* *Coaches others in the design and implementation of learning plans*	• Models practice improvement and adaptability • Develops educational module for collaboration with other patient care team members • Assists more junior residents and medical students in developing individualized learning plans
Assessment Models or Tools	• Clinical evaluations • Direct observation • Medical record (chart) reviews

	• Multisource feedback • Review of learning plan • Semi-annual evaluations
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. • Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. *Acad Med.* 2009 Aug;84(8):1066-74. NOTE: Contains a validated questionnaire about physician lifelong learning. • Lockspeiser TM, Schmitter PA, Lane JL et al. Assessing residents' written learning goals and goal writing skill: validity evidence for the learning goal scoring rubric. *Acad Med.* 2013 Oct;88(10)1558-63.

Practice-Based Learning and Improvement 3: Scholarly Activity	
Overall Intent: To identify areas worthy of investigation, design and implement a plan for investigation, and disseminate the findings of scholarly work	

Milestones	Examples
Level 1 *Identifies areas worth of scholarly investigation*	• Identifies areas of interest and begins to formulate a research question • Compiles a thorough literature review on topic of interest
Level 2 *Designs a hypothesis-driven or hypothesis generating scholarly thesis, under the direction of a research mentor*	• Creates an original research plan with a mentor • With assistance of a mentor, outlines a hypothesis and plan to test two different insulin management strategies for patients with pregestational diabetes • Applies for local or institutional grant funding
Level 3 *Presents products of scholarly activity at local, regional, or national meetings, and/or submits an abstract to regional, state, or national meetings*	• Leads a project executing the plan to test insulin management strategies • In collaboration with a statistician or supervisor, analyzes collected data and writes an abstract comparing insulin strategies • Presents original research on insulin management in pregnancy at the department or institutional level • Presents original research on insulin management in pregnancy at a local or regional obstetrics or endocrinology meeting
Level 4 *Completes and defends a comprehensive written scholarly thesis that remonstrates advanced research methodology, design, and statistical analysis*	• Presents original research on insulin management in pregnancy at a national meeting • Defends thesis • Publishes findings in a peer-reviewed journal
Level 5 *Publishes independent research that generates new medical knowledge, education programs, or process improvement*	• Mentors another fellow or resident through a research project • Designs a novel research project on insulin management in pregnancy and applies for American Diabetes Association or Reproductive Scientist Development Program grant funding
Assessment Models or Tools	• Assessment of quality of presentations and/or research • Assessment of quality of publications, protocols, and/or grants • Direct observation • Portfolio
Curriculum Mapping	•
Notes or Resources	• Blome C, Sondermann H, Augustin M. Accepted standards on how to give a medical research presentation: A systematic review of expert opinion papers. *GMS Journal for Medical Education*. 2017;34(1):Doc11. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5327661/. 2021. • Schünemann HJ, Wiercioch W, Brozek J, et al. GRADE Evidence to Decision (EtD) frameworks for adoption, adaption, and de novo development of trustworthy

	recommendations: GRADE-ADOLOPMENT. *Journal of Clinical Epidemiology*. 2017;81:101-110. https://www.jclinepi.com/article/S0895-4356(16)30482-6/fulltext. 2021. • Schulz KF, Grimes DA. *The Lancet Handbook of Essential Concepts in Clinical Research*. Edinburgh: Elsevier; 2006.

Professionalism 1: Professional Behavior	
Overall Intent: To recognize and address lapses in professional behavior, demonstrates professional behaviors, and use appropriate resources for managing professional dilemmas	

Milestones	Examples
Level 1 *Identifies and describes potential triggers for professionalism lapses and how to appropriately report professionalism lapses*	• Understands that being tired can cause a lapse in professionalism • Understands being late to sign-out has adverse effect on patient care and on professional relationships • Recognizes outside-of-work activities that can lead to lapse in professionalism while at work • Completes training in appropriate reporting process for professionalism lapses
Level 2 *Demonstrates insight into professional behavior in routine situations and takes responsibility for one's own professionalism lapses*	• Respectfully approaches a resident who is late to sign-out about the importance of being on time • Recognizes a time in which their actions were not viewed as professional by staff members and takes appropriate steps to alter future behavior • Notifies appropriate supervisor when a resident is routinely late to sign-out
Level 3 *Demonstrates professional behavior in complex or stressful situations*	• Appropriately responds to a distraught family member, following an unsuccessful resuscitation attempt of a relative • After noticing a colleague's inappropriate social media post, reviews policies related to posting of content and seeks guidance
Level 4 *Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in oneself and others*	• Actively considers the perspectives of others in stressful situations • Models respect for patients and promotes the same from colleagues, when a patient has been waiting an excessively long time to be seen
Level 5 *Develops programs for others to recognize potential triggers for professionalism lapses and approaches to anticipate and manage professional behavior*	• Coaches others when their behavior fails to meet professional expectations and creates a performance improvement plan to prevent recurrence
Assessment Models or Tools	• Direct observation • Global evaluation • Multisource feedback • Oral or written self-reflection • Simulation
Curriculum Mapping	•
Notes or Resources	• American Board of Internal Medicine; American College of Physicians-American Society of Internal Medicine; European Federation of Internal Medicine. Medical professionalism in the new millennium: a physician charter. *Ann Intern Med*. 2002;136:243-246.

http://abimfoundation.org/wp-content/uploads/2015/12/Medical-Professionalism-in-the-New-Millenium-A-Physician-Charter.pdf • American Medical Association Code of Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics 2019. • Bynny RL, Paauw DS, Papadakis MA, Pfeil S. Medical professionalism. Best practices: professionalism in the modern era. 2017. ISBN: 978-1-5323-6516-4 • 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. doi: 10.5858/arpa.2016-2017-CP • Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. 1st ed. McGraw-Hill Education; 2014.

Professionalism 2: Ethical Principles	
Overall Intent: To recognize and address lapses in ethical behavior, demonstrates ethical behaviors, and use appropriate resources for managing ethical dilemmas	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of ethical principles*	• Articulates how the principle of "do no harm" applies to a patient who may not need an operative delivery even though the learning opportunity exists
Level 2 *Analyzes and applies ethical principles to straightforward situations*	• Identifies and applies ethical principles involved in informed consent when the patient is unclear of all the procedural risks • For a pregnant woman refusing surgery at term for recurrent late decelerations, describes an ethical theory that would help resolve the issue and provide a safe, quality health care experience for the patient and her baby
Level 3 *Recognizes the need to seek help in managing and resolving complex ethical situations*	• Offers treatment options for a fetus with an open neural tube defect, free of bias, while recognizing own limitations, and consistently honoring the patient's choice • Defends and recognizes limits in how personal proposed ethical guidelines will hold health care providers accountable to themselves and their profession, and seeks out an appropriate ethical consultation
Level 4 *Recognizes and uses appropriate resources for managing and resolving ethical dilemmas as needed, and identifies system-level issues that induce or exacerbate ethical problems*	• Recognizes and uses ethics consults, literature, risk-management/legal counsel to resolve ethical dilemmas surrounding previable birth • Selects a physician-patient shared decision-making model and explains how to assemble an appropriate team that can provide guidelines for a safe, quality health care experience for the patient
Level 5 *Seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution*	• Engages stakeholders to address excessive wait times in the clinic to decrease patient and provider frustrations that lead to unprofessional behavior • Proposes ethical guidelines that would help improve COVID-19 vaccination and masking rates in pregnant patients and their partners presenting to labor and delivery who have been hesitant to wear masks and/or be vaccinated to help prevent disease spread
Assessment Models or Tools	• Direct observation • Global evaluation • Multisource feedback • Oral or written self-reflection • Simulation
Curriculum Mapping	•
Notes or Resources	• ACOG. Ethical decision making in obstetrics and gynecology. 2007. https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2007/12/ethical-decision-making-in-obstetrics-and-gynecology

	• ACOG. Code of professional ethics. 2018. https://www.acog.org/-/media/project/acog/acogorg/files/pdfs/acog-policies/code-of-professional-ethics-of-the-american-college-of-obstetricians-and-gynecologists.pdfAmerican College of Physicians. American College of Physicians Ethics Manual, 7thedition. www.acponline.org
	• American Medical Association Code of Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics 2019.
	• American Board of Internal Medicine; American College of Physicians-American Society of Internal Medicine; European Federation of Internal Medicine. Medical professionalism in the new millennium: a physician charter. *Ann Intern Med*. 2002;136:243-246. http://abimfoundation.org/wp-content/uploads/2015/12/Medical-Professionalism-in-the-New-Millenium-A-Physician-Charter.pdf
	• Bynny RL, Paauw DS, Papadakis MA, Pfeil S. Medical professionalism. Best practices: professionalism in the modern era. 2017. ISBN: 978-1-5323-6516-4
	• 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. doi: 10.5858/arpa.2016-2017-CP
	• Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. 1st ed. McGraw-Hill Education; 2014.

Professionalism 3: Accountability/Conscientiousness	
Overall Intent: To take responsibility for one's own actions and the impact on patients and other members of the health care team	

Milestones	Examples
Level 1 *Takes responsibility for failure to complete tasks and responsibilities, identifies potential contributing factors, and describes strategies for ensuring timely task completion in the future*	• Acknowledges that end-of-rotation evaluations were not completed and develops a calendar reminder
Responds promptly to requests or reminders to complete tasks and responsibilities	• Responds promptly to reminders from program administrator to complete work hour and case logs
Level 2 *Consistently performs tasks and responsibilities in a timely manner, with appropriate attention to detail, in routine situations*	• Completes administrative tasks such as annual Health Insurance Portability and Accountability Act (HIPAA) modules, licensing requirements, etc. by specified due date • Consistently closes charts in a timely manner
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 *Consistently performs tasks and responsibilities in a timely manner, with appropriate attention to detail, in complex or stressful situations*	• Notifies attending of multiple competing demands on call, appropriately triages tasks, and asks for assistance from other residents or faculty members, as needed
Proactively implements strategies to ensure the ability to complete tasks and responsibilities in a timely manner	• In preparation for being out of the office, arranges coverage for assigned clinical tasks on patients and ensures appropriate continuity of care
Level 4 *Recognizes situations that may impact others' ability to complete tasks and responsibilities in a timely manner*	• Takes responsibility for inadvertently omitting key patient data requiring follow-up during sign out 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	• Creates a checklist for discharge planning for complex patients • Anticipates absences due to COVID-19 infection and implements a back-up coverage schema
Level 5 *Recognizes one's own role in leading the care of all patients on the service, while*	• Sets up a meeting with the nurse manager to streamline patient discharges and leads team to find solutions to the problem

mentoring/coaching other team members to ensure the best possible care of patients, including prioritizing tasks and mitigating burnout *Develops workshops or programs to mentor and coach other team members to ensure the best possible care of patients, including prioritizing tasks and mitigating burnout*	• Supervises and mentors more junior residents, assisting with prioritization of clinical tasks to achieve completion in safest, most efficient manner • Works with nursing mangers to rectify systems-based issues
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	• Code of conduct from fellow institutional manual • Expectations of fellowship program regarding accountability and professionalism

Professionalism 4: Self-Awareness and Help-Seeking Behaviors	
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 status of personal and professional well-being, with assistance*	• Acknowledges own response to patient's fatal genetic diagnosis during debriefing • Implements change based on feedback on missed emotional cues after a family meeting
Level 2 *Independently recognizes status of personal and professional well-being*	• Independently identifies and communicates impact of a personal family tragedy • Recognizes a pattern of missing emotional cues during family meetings and asks for feedback • Recognizes symptoms of personal stress triggers or burnout
Level 3 *With assistance, proposes a plan to optimize personal and professional well-being*	• With a mentor, develops a reflective response to deal with personal impact of difficult patient encounters and disclosures • Integrates feedback from the multidisciplinary team to develop a plan for identifying and responding to emotional cues during the next family meeting • Identifies ways to identify and manage symptoms of burnout
Level 4 *Independently develops a plan to optimize personal and professional 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
Level 5 *Develops programs for others to recognize and develop plans to optimize personal and professional well-being*	• 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
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 fellow's well-being. Rather, the intent is to ensure that each fellow has the fundamental knowledge of factors that impact well-being, the mechanism by which those factors impact well-being, and available resources and tools to improve well-being. • ACGME. Well-Being Tools and Resources. http://dl.acgme.org/pages/well-being-tools-resources. • Hicks PJ, Schumacher D, Guralnick S, Carraccio C, Burke AE. Domain of competence: personal and professional development. *Acad Pediatr*. 2014 Mar-Apr;14(2 Suppl):S80-97. • Local resources, including Employee Assistance Programs

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; organize and lead communication around shared decision making	

Milestones	Examples
Level 1 *Demonstrates respect and establishes rapport with patients and their families* *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; discusses resident role within the health care team • Shows situational awareness of language, disability, health literacy level, and culture • Identifies need for trained interpreter with non-English-speaking patients
Level 2 *Establishes a therapeutic relationship in straightforward encounters* *Identifies barriers to effective communication*	• Avoids medical jargon and restates patient perspective when discussing prenatal care • Inquires whether patient needs prescription instructions written in a different language • Recognizes the differences to how patient absorb knowledge, such as the need for handouts with diagrams and pictures and electronic resources and videos to communicate information • Prioritizes and sets agenda at the beginning of the appointment for a new patient with chronic medical conditions • Identifies health literacy and culture as barriers to communication
Level 3 *Establishes a therapeutic relationship in challenging encounters* *When prompted, reflects on personal biases while attempting to minimize communication barriers*	• In a discussion with the faculty member, acknowledges discomfort in caring for a patient who is morbidly obese with diabetes in pregnancy and does not want to make lifestyle changes • Discusses all treatment options for a patient with ruptured membranes at 18 weeks gestation and incorporates her preferences in developing a shared decision-making care plan • Participates in a family meeting to determine a plan for complex fetal anomalies
Level 4 *Facilitates difficult discussions specific to patient and patient family conferences,* *Independently recognizes personal biases while attempting to proactively minimize communication barriers*	• Continues to engage representative family members with disparate goals in the care of a patient with complex fetal anomalies • Leads a family meeting to determine a plan for patient with complex fetal anomalies, using patient and family input • Reflects on personal bias of a patient's decision to terminate a pregnancy and solicits input from faculty about overcoming these biases
Level 5 *Mentors others in situational awareness and critical self-reflection*	• Leads a discussion group on personal experience of moral distress • Develops a residency curriculum on social justice which addresses unconscious bias • Serves on a hospital bioethics committee

Coaches others in the facilitation of crucial conversations	
Assessment Models or Tools	• Direct observation • Self-assessment including self-reflection exercises • Skills needed to Set the state, Elicit information, Give information, Understand the patient, and End the encounter (SEGUE) • 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. • Makoul G. Essential elements of communication in medical encounters: The Kalamazoo consensus statement. *Acad Med*. 2001;76:390-393. • Makoul G. The SEGUE Framework for teaching and assessing communication skills. *Patient Educ Couns*. 2001;45(1):23-34. • Symons AB, Swanson A, McGuigan D, Orrange S, Akl EA. A tool for self-assessment of communication skills and professionalism in fellows. *BMC Med Educ*. 2009; 9:1.

Interpersonal and Communication Skills 2: Patient Counseling and Shared Decision Making	
Overall Intent: To explain treatments and alternatives to patients and help them choose treatment options that best aligns with their preferences as well as their unique cultural and personal beliefs	
Milestones	**Examples**
Level 1 *Demonstrates understanding of and executes the informed consent process*	• Identifies the components of the informed consent, including the indication for the procedure, alternatives to management and risks/ benefits of management choices • Acknowledges that preoperative patients need informed consent before undergoing surgical procedures
Level 2 *Counsels patients through the decision-making process, including answering questions, for simple clinical problems*	• Counsels patient regarding risks/ benefits of history indicated cerclage placement • Discusses postoperative pain management following cesarean section
Level 3 *Counsels patients through the decision-making process, including answering questions, for complex clinical problems*	• For a patient with placental accreta spectrum, discusses surgical approaches (type of laparotomy), risks and benefits to each, and helps determine the safest surgical approach • Counsels patient with periviable fetus on management options for her severe preeclampsia
Level 4 *Counsels patients through the decision-making process, including answering questions, in cases of diagnostic and therapeutic uncertainty*	• Counsels patient with a multiple gestation about selective fetal reduction
Level 5 *Provides education to interdisciplinary learners about shared decision making for complex clinical problems*	• Leads discussion with a multidisciplinary team regarding a patient who is intubated and sedated and may not have a health care proxy
Assessment Models or Tools	• Chart; stimulated recall • Direct observation • Global assessment • Medical record (chart) audit • Multisource feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• Alston C, Berger Z, Brownlee S, Elwyn G, Fowler Jr FJ, Hall LK, Montori VM, Moulton B, Paget L, Haviland-Shebel B, Singerman R, Walker J, Wynia MK, Henderson D. Shared decision-making strategies for best care: patient decision aids. *NAM Perspectives.* Discussion Paper, National Academy of Medicine, Washington, DC. 2014. https://doi.org/10.31478/201409f • Elwyn G, Frosch D, Thomson R, Joseph-Williams N, Lloyd A, Kinnersley P, Cording E, Tomson D, Dodd C, Rollnick S, Edwards A, Barry M. Shared decision making: a model for

	clinical practice. *J Gen Intern Med*. 2012 Oct;27(10):1361-7. doi: 10.1007/s11606-012-2077-6. Epub 2012 May 23. PMID: 22618581; PMCID: PMC3445676.

Interpersonal and Communication Skills 3: Interprofessional and Team Communication	
Overall Intent: To effectively communicate with the health care team, including consultants, in both straightforward and complex situations	

Milestones	Examples
Level 1 *Understands and respects the role and function of interprofessional team members*	• Receives consult request for a patient with abdominal pain in pregnancy, asks clarifying questions politely, and expresses gratitude for the consult • Acknowledges the contribution of each member of the health care team to the patient • Acknowledges the need for consult of the neonatology ICU team to assist with recommendations for a patient who presented with PPROM at 28 weeks
Level 2 *Solicits insights from and uses language that values all interprofessional team members*	• Sends a message in the EHR to the registered dietician to inquire about the appropriateness of increasing the calorie count in a patient with gestational diabetes • Acknowledges in the medical record the contribution of the neonatal intensive care unit (NICU) team in helping make decisions regarding delivery planning • Consistently uses inclusive language
Level 3 *Integrates contributions from interprofessional team members into the care plan*	• Uses recommendations of consulting teams for discharge planning • Uses closed-loop communication with team members after interdisciplinary morning rounds to develop and enact a treatment plan
Level 4 *Prevents and mediates conflict and distress among the interprofessional team members*	• Demonstrates active listening by asking team members about their concerns and questions during patient rounds • Initiates debriefing session amongst labor and delivery team members after an obstetric emergency
Level 5 *Fosters a culture of open communication and effective teamwork within the interprofessional team*	• Mediates a conflict resolution between different members of the health care team, solicits other team member's opinions when making clinical decisions
Assessment Models or Tools	• Direct observation • Global assessment • Medical record (chart) audit • Multisource feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• Braddock CH, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: time to get back to basics. *JAMA* 1999;282:2313-2320. • Dehon E, Simpson K, Fowler D, Jones A. Development of the faculty 360. *MedEdPORTAL.* 2015;11:10174 http://doi.org/10.15766/mep_2374-8265.10174

- Fay D, Mazzone M, Douglas L, Ambuel B. A validated, behavior-based evaluation instrument for family medicine residents. *MedEdPORTAL Publications*. 2007 May; 10.15766/mep_2374-8265.622.
- François, J. Tool to assess the quality of consultation and referral request letters in family medicine. *Can Fam Physician*. 2011 May;57(5), 574-575.
- Green M, Parrott T, Cook G. Improving your communication skills. *BMJ* 2012;344:e357 doi: https://doi.org/10.1136/bmj.e357
- Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: a review with suggestions for implementation. *Med Teach*. 2013 May; 35(5):395-403. doi: 10.3109/0142159X.2013.769677.
- Lane JL, Gottlieb RP. Structured clinical observations: a method to teach clinical skills with limited time and financial resources. *Pediatrics*. 2000;105:973-7.
- Makoul GT. SEGUE Framework for teaching and assessing communications skills. *Patient Educ Couns* 2001 Oct;45(1):23-34. doi: 10.1016/s0738-3991(01)00136-7
- Roth CG, Eldin KW, Padmanabhan V, Freidman EM. Twelve tips for the introduction of emotional intelligence in medical education. Med Teach. 2018 Jul 21:1-4. doi: 10.1080/0142159X.2018.1481499. [Epub ahead of print]

Interpersonal and Communication Skills 4: 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*	• Fills in all elements of a documentation template with the most up-to-date information available
Safeguards patient personal health information	• Shreds patient list after rounds; avoids talking about patients in public spaces
Level 2 *Demonstrates organized diagnostic and therapeutic reasoning through notes in the patient record*	• Creates accurate, original notes that do not contain extraneous information such as verbatim transcriptions of radiology reports, and concisely summarizes the assessment and plan
Documents required data in formats specified by institutional policy	• Uses department smart phrases and clinical smart sets for orders/documentation
Level 3 *Concisely reports diagnostic and therapeutic reasoning in the patient record in an efficient manner*	• Complex clinical thinking is documented concisely but may not contain anticipatory guidance
Appropriately selects direct and indirect forms of communication based on context	• Calls patient or sends electronic request to have nursing staff contact patient immediately about potentially critical test results
Level 4 *Communicates clearly, concisely, timely, and in an organized written form, including anticipatory guidance*	• Documentation is consistently accurate, organized, and concise, and frequently incorporates anticipatory guidance
Achieves written or verbal communication that serves as an example for others to follow	• Consult notes are used as an example when teaching learners
Level 5 *Models feedback to improve others' written communication*	• Leads a task force established by the hospital QI committee to develop a plan to improve house staff hand-off checklists • Mentors/coaches colleagues how to improve clinical notes, including terminology, billing compliance, conciseness, and inclusion of all required elements
Guides departmental or institutional communication around policies and procedures	• Creates a policy around HIPAA compliant electronic communication (e.g., texting)
Assessment Models or Tools	• Direct observation • Multisource feedback • Medical record (chart) audit
Curriculum Mapping	•

Notes or Resources	• Bierman JA, Hufmeyer KK, Liss DT, Weaver AC, Heiman HL. Promoting responsible electronic documentation: validity evidence for a checklist to assess progress notes in the electronic health record. *Teach Learn Med.* 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. 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, Spector ND, Srivastava R, et al. I-pass, a mnemonic to standardize verbal handoffs. *Pediatrics.* 2012;129.2:201-204. https://pediatrics.aappublications.org/content/129/2/201.long?sso=1&sso_redirect_count=1&nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token. 2020.

To help programs transition to the new version of the Milestones, the ACGME has mapped the original Milestones 1.0 to the new Milestones 2.0. Indicated below are where the subcompetencies are similar between versions. These are not exact matches but are areas that include similar elements. Not all subcompetencies map between versions. Inclusion or exclusion of any subcompetency does not change the educational value or impact on curriculum or assessment.

Milestones 1.0	Milestones 2.0
PC1: Labor and Delivery Procedures	PC1: Labor and Delivery
PC2: Sonographic Diagnosis and Procedures	PC2: Sonographic Diagnosis and Procedures
PC3: Medical Complications of Pregnancy	PC3: Complications of Pregnancy PC5: Critical Care
PC4: Obstetrical Complications	PC3: Complications of Pregnancy
	PC4: Complex Genetic Counseling
MK1: Pathology, Anatomy, and Physiology	
MK2: Medical Complications of Pregnancy	MK1: Medical Complications of Pregnancy
MK3: Obstetrical Complications	MK2: Obstetrical Complications
MK4: Genetic Principles	MK3: Genetic Principles
MK5: Prenatal Imaging and Diagnosis	MK4: Prenatal Imaging and Diagnosis
SBP1: Computer Systems	ICS4: Communication within Health Care Systems
SBP2: Value-based Care	SBP6: Physician Role in the Health Care Systems
	SBP1: Patient Safety
	SBP3: System Navigation for Patient-Centered Care - Coordination of Care
	SBP5: Community and Population Health
PBLI1: Scholarly Activity	
PBLI2: Quality Improvement	SBP2: Quality Improvement
PBLI3: Education of Team Members	
	PBLI1: Evidence-Based and Informed Practice
	PBLI2: Reflective Practice and Commitment to Personal Growth
PROF1: Professional Ethics and Accountability	PROF2: Ethical Principles PROF3: Accountability/Conscientiousness
PROF2: Compassion, Integrity, and Respect for Others	PROF1: Professional Behavior
	PROF4: Self-Awareness and Help-Seeking
ICS1: Teamwork and Communication with Physicians and Other Health Professionals	ICS3: Interprofessional and Team Communication

	SBP4: System Navigation for Patient-Centered Care - Transitions of Care
ICS2: Communication with Patients and Families	ICS1: Patient- and Family-Centered Communication
	ICS2: Patient Counseling and Shared Decision Making

Available Milestones Resources

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

Milestones Guidebooks: https://www.acgme.org/milestones/resources/
- *Assessment Guidebook*
- *Clinical Competency Committee Guidebook*
- *Clinical Competency Committee Guidebook Executive Summaries*
- *Implementation Guidebook*
- *Milestones Guidebook*

Milestones Guidebook for Residents and Fellows: https://www.acgme.org/residents-and-fellows/the-acgme-for-residents-and-fellows/
- Milestones Guidebook for Residents and Fellows
- Milestones Guidebook for Residents and Fellows Presentation
- Milestones 2.0 Guide Sheet for Residents and Fellows

Milestones Research and Reports: https://www.acgme.org/milestones/research/
- *Milestones National Report*, updated each fall
- *Milestones Predictive Probability Report,* updated each fall
- *Milestones Bibliography*, updated twice each year

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

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

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

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

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

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