Supplemental Guide:
Adult Congenital Heart Disease

ACGME

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Adult Congenital Heart Disease 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: Inpatient Care **Overall Intent:** To understand the implications of cardiac complications in patients with congenital heart disease of various complexity and provide disease specific recommendations for patients hospitalized for acute cardiac issues or for elective procedures	
Milestones	**Examples**
Level 1 *With indirect supervision, performs a history and exam, reviews data, and reports results for patients with adult congenital heart disease (ACHD) admitted with cardiac issues (e.g., acute coronary syndromes, cardiogenic shock, decompensated heart failure, and arrhythmias, pulmonary hypertension) or for cardiovascular procedures*	• Performs history and physical and reviews data for a patient with an atrial septal defect and atrial fibrillation without the attending in the room; presents to and receives guidance from the attending. Requires direct attending input to formulate the care plan.
With indirect supervision, performs inpatient consultation for patients with simple complexity ACHD admitted for non-cardiovascular procedures or diagnoses	• Evaluates a patient with an unrepaired atrial septal defect undergoing a hip replacement without the attending in the room; presents to and receives guidance from the attending. Requires direct attending input to formulate a comprehensive care plan.
Level 2 *With indirect supervision, manages inpatients with simple and moderate complexity ACHD admitted for active cardiac conditions or cardiovascular procedures*	• Performs an accurate and complete history and exam in a patient with a sinus venosus defect and partial anomalous pulmonary venous return admitted with atrial fibrillation and manages recommendations such as diuresis without attending input; discusses recommendations with the primary team without the attending present but attending input is still required for more complex decisions, such as referral for electrophysiology study and ablation
With indirect supervision, performs inpatient consultation for patients with simple and moderate complexity ACHD admitted for non-cardiovascular procedures or diagnoses	• Performs an adult congenital heart disease consultation and identifies possible peri-procedural risks for a patient with a sinus venosus defect and partial anomalous pulmonary venous return undergoing a hip replacement, without the attending in the room; presents to and receives guidance from the attending, and discusses recommendations with the primary team without the attending present although attending input is still required for more complex procedures or anatomy
Level 3 *With indirect supervision, manages inpatients with high complexity ACHD admitted for active cardiac conditions or cardiovascular procedures*	• Performs an accurate and complete history and exam in a patient with D-transposition of the great arteries and Mustard palliation admitted for heart failure, formulates recommendations such as diuresis and arrythmia management without the attending input, although attending input is still required for more complex decisions, like the need for surgical or transcatheter intervention

With indirect supervision, performs inpatient consultation for patients with high complexity ACHD admitted for non-cardiovascular procedures or diagnoses	• Performs an adult congenital heart disease consultation and identifies possible peri-procedural risks for a patient with D-transposition of the great arteries and Mustard palliation undergoing bone marrow transplantation, without the attending in the room; presents to and receives guidance from the attending and discusses recommendations with the primary team without the attending present
Level 4 *Independently manages inpatients with any level of ACHD complexity admitted with active cardiac conditions or for cardiovascular procedures* *Independently performs inpatient consultation for patients with any level of ACHD complexity admitted for non-cardiovascular procedures or diagnoses*	• Performs an accurate and complete history and exam in a failing Fontan patient admitted with arrhythmias, and independently formulate recommendations such as cardioversion, referral for electrophysiology study and ablation, and anticoagulation management. Although the fellow still presents to the attending, little or no attending input is required • Performs an adult congenital heart failure consultation and identifies possible peri-procedural risks for a patient with Eisenmenger syndrome and a hip fracture requiring surgery, including anesthesia and bleeding risks; formulates and communicates recommendations for management of risk factors, and while the fellow still presents to the attending, little or no attending input is required
Level 5 P*resents and integrates comprehensive patient data and leads a multidisciplinary patient care conference for challenging inpatient cases*	• For a patient with failing Fontan physiology and severe atrioventricular regurgitation admitted with heart failure, the fellow synthesizes clinical data, imaging and catheterization findings, and presents the patient data in a multidisciplinary conference and lead the discussion
Assessment Models or Tools	• Direct observation • Medical record (chart) review • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• For level of AP classification: ○ Simple = I A-B ○ Moderate = I-C, IIA-C ○ Complex = I-II D, III A-D • Stout KK, Daniels CJ, Aboulhosn JA, et al. Correction to: 2018 AHA/ACC guideline for the management of adults with congenital heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation.* 2019;139(14):e833-e834. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000683. 2021.

Patient Care 2: Outpatient Care **Overall Intent:** To synthesize an outpatient adult congenital heart disease-specific history, physical exam, and testing with the anatomy and hemodynamics in order to formulate a disease-specific, guideline directed assessment and plan for congenital heart disease patients	
Milestones	**Examples**
Level 1 *With indirect supervision, performs a comprehensive ACHD-specific cardiac history and exam for patients with simple complexity ACHD*	• Performs a history and physical and reviews data for a patient with a secundum atrial septal defect and right ventricular volume overload without the attending in the room; presents to and receives guidance from the attending, who points out additional relevant physical exam findings.
With indirect supervision, reviews and interprets diagnostic tests for patients with simple complexity ACHD	• For a patient with a secundum atrial septal defect and right ventricular volume overload, interprets the echocardiogram and identify pertinent findings. The fellow requires attending input for interpretation of Cardiopulmonary Exercise Testing (CPET), computerized tomography (CT), cardiac catheterization, and cardiac magnetic resonance imaging (MRI), and todetermine the pulmonary flow:systemic flow (Qp:Qs).
With indirect supervision, formulates a disease-specific, guideline-directed assessment and plan for patients with simply complexity ACHD	• Formulates an assessment and plan for the patient with a secundum atrial septal defect and right ventricular volume overload, but requires attending input to formulate and implement a plan for atrial septal defect closure
Level 2 *With indirect supervision, performs a comprehensive ACHD-specific history and physical exam for patients with simple and moderate complexity ACHD*	• Performs a history and exam in a patient with repaired tetralogy of Fallot and heart failure without the attending in the room, though requires some input from the attending
With indirect supervision, reviews and interprets diagnostic tests for patients with simple and moderate complexity ACHD	• Reviews and interprets recent testing such as an echocardiogram, cardiopulmonary exercise testing, and cardiac magnetic resonance imaging and assesses the degree of pulmonary regurgitation, right ventricular function, and right ventricular dilation without the attending present, though requires some input from the attending
With indirect supervision, formulates an assessment and plan for a patient with simple and moderate complexity ACHD	• Formulates a plan for pulmonary valve replacement in a patient with repaired tetralogy of Fallot without the attending present, though requires some input from the attending
Level 3 *With indirect supervision, performs a comprehensive ACHD-specific history and physical exam for patients with high complexity ACHD*	• Performs a history and exam in a patient with a Fontan without the attending in the room, though requires some input from the attending

With indirect supervision, reviews and interprets diagnostic tests for patients with high complexity ACHD *With indirect supervision, formulates an assessment and plan for patients with high complexity ACHD*	• Reviews and interprets recent testing such as an echocardiogram, cardiopulmonary exercise testing, and cardiac MRI and can assess the ventricular function, venous-venous collaterals, Fontan pathway patency, and atrial dilation without the attending present, though requires some input from the attending • Formulates a plan for Fontan conversion without the attending present, though requires some input from the attending
Level 4 *Independently performs a comprehensive ACHD-specific history and physical exam for patients with any level of ACHD complexity* *Independently reviews and interprets diagnostic tests for patients with any level of ACHD complexity* *Independently formulates an assessment and plan for patients with any level of ACHD complexity*	• Independently performs a history, physical, review testing, and formulates a treatment plan for a patient with single ventricle physiology (Fontan), and attending input is not required
Level 5 P*resents and integrates comprehensive patient data and leads a multidisciplinary patient care conference for challenging outpatient cases*	• For a patient with D-transposition of the great arteries status post atrial switch operation, baffle leak, and tricuspid regurgitation, synthesizes clinical data, imaging, and catheterization findings, and presents the patient data in a multidisciplinary conference and lead the discussion
Assessment Models or Tools	• Direct observation • Medical record (chart) review • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• For level of AP classification: ○ Simple = I A-B ○ Moderate = I-C, IIA-C ○ Complex = I-II D, III A-D • Stout KK, Daniels CJ, Aboulhosn JA, et al. Correction to: 2018 AHA/ACC guideline for the management of adults with congenital heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation.* 2019;139(14):e833-e834. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000683. 2021.

Patient Care 3: Heart Failure Management for Patients with Adult Congenital Heart Disease **Overall Intent:** To provide care for patients in the inpatient and outpatient setting	
Milestones	**Examples**
Level 1 *With indirect supervision, provides heart failure inpatient and outpatient care for patients with simple complexity ACHD, including clinical history taking, physical examination, and establishment of a treatment plan*	• Performs an accurate and complete history and exam in a patient with an atrial septal defect in heart failure and formulates an assessment and treatment plan without the presence of an attending ACHD physician; presents to and receives guidance from the attending, who then confirms the findings and plan with the patient
Level 2 *With indirect supervision, provides heart failure inpatient and outpatient care for patients with simple and moderate complexity ACHD, including clinical history taking, physical examination, and establishment of a treatment plan*	• Performs a history and exam in a patient with tetralogy of Fallot and heart failure, and formulates an assessment and plan without the attending in the room; presents to and receives guidance from the attending, who then confirms the findings and plan with the patient
Level 3 *With indirect supervision, provides heart failure inpatient and outpatient care for patients with high complexity ACHD, including clinical history taking, physical examination, and establishment of a treatment plan*	• Performs a history and exam in a patient with a systemic right ventricle and heart failure, and formulates an assessment and plan without the attending in the room; presents to and receives guidance from the attending, who then confirms the findings and plan with the patient
Level 4 *Independently provides heart failure inpatient and outpatient care for patients with any level of ACHD complexity, including clinical history taking, physical examination, and establishment of a treatment plan*	• Performs a history and exam in patients with any type of congenital heart disease and heart failure, and formulates an assessment and plan without the assistance of an attending in the room; attending gives minimal or no additional input for simple to moderate complexity patients (e.g., unrepaired partial anomalous pulmonary venous return with heart failure), but sometimes gives input on the most complex patients (e.g., failing Fontan patients)
Level 5 *Presents and integrates comprehensive patient data and leads a multidisciplinary patient care conference for challenging heart patient cases*	• Acts as a leader in multidisciplinary heart discussions involving patients with all types of congenital heart disease and advanced heart failure; provides vital input on the relevant anatomic and hemodynamic considerations and potential barriers to advanced therapies, offers solutions tailored for the patient's specific cardiac lesion
Assessment Models or Tools	• Direct observation • Medical record (chart) review • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• For level of AP classification: ○ Simple = I A-B

	○ Moderate = I-C, IIA-C ○ Complex = I-II D, III A-D • Stout KK, Daniels CJ, Aboulhosn JA, et al. Correction to: 2018 AHA/ACC guideline for the management of adults with congenital heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation.* 2019;139(14):e833-e834. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000683. 2021.

Patient Care 4: Transplant Mechanical Circulatory Support Care **Overall Intent:** To care for patients in need of mechanical support and heart transplantation, including assessment of anatomic and hemodynamic input for patients with complex adult congenital heart disease lesions on mechanical cardiac support	
Milestones	**Examples**
Level 1 *Recognizes clinical signs and symptoms associated with end-stage heart failure in various forms of congenital heart disease (e.g., Fontan circulation)*	• Recognizes volume overload state and the effects of longstanding high venous pressures on liver morphology and function in patients with a Fontan circulation
Recognizes the unique anatomic features of various congenital heart lesions and their applicability to advanced treatment options, including mechanical support and heart transplantation	• Recognizes anatomic barriers associated with ventricular assist device implantation in patients with a systemic right ventricle
Level 2 *With direct supervision, interprets imaging and laboratory studies and manages patients with ACHD and advanced heart failure in need of mechanical support and heart transplantation*	• Requires the attending to be present during review of imaging (e.g., echocardiograms, MRIs) to formulate an assessment of systemic right ventricular function, evaluate for baffle stenoses or leaks in patients with D-loop transposition of the great arteries who underwent an atrial switch operation
Participates in and provides anatomic and hemodynamic input for patients with complex ACHD lesions at multi-disciplinary heart failure meetings	• Clearly describes the invasive hemodynamic data of patients with a failing Fontan system in multidisciplinary heart failure meetings
Level 3 *With indirect supervision, interprets imaging and laboratory studies and manages the care of patients with ACHD and advanced heart failure in need of mechanical support and heart transplantation*	• For a patient with failing Fontan in an intensive care unit setting, the fellow performs a history and physical exam and reviews relevant imaging studies and lab results without the attending present, and manages inotropic and vasopressor support and mechanical ventilation settings with minimal attending input
With direct supervision, provides anatomic and hemodynamic input for patients with complex ACHD lesions on mechanical cardiac support	• With the attending present, provides anatomic and hemodynamic input to the cardiomyopathy team for patients with adult congenital heart disease and right-sided ventricular assist devices due to right ventricular failure (e.g., patients with pulmonary atresia and intact ventricular septum and a biventricular physiology)
Level 4 *Independently interprets imaging and laboratory studies and manages the care of patients with ACHD and advanced heart failure*	• Independently interprets the laboratory results of patients with Eisenmenger syndrome waiting for combined heart and lung transplantation while correctly identifying relative anemia, coagulopathies, and chronic respiratory compensation for chronic hypoxemia

in need of mechanical support and heart transplantation *With indirect supervision, provides anatomic and hemodynamic input for patients with complex ACHD lesions on mechanical cardiac support*	• Provides anatomic and hemodynamic input for adult congenital heart disease patients with a systemic right ventricle and cardiogenic shock placed on an extracorporeal membrane oxygenator (ECMO) machine without the attending present, though attending input is still required
Level 5 *Independently provides anatomic and hemodynamic input for patients with complex ACHD lesions on mechanical cardiac support*	• Provides anatomic and hemodynamic input for adult congenital heart disease patients with a systemic right ventricle and cardiogenic shock placed on an ECMO machine without attending input
Assessment Models or Tools	● Case log (for imaging studies) ● Direct observation ● Medical record (chart) review ● Multisource feedback
Curriculum Mapping	●
Notes or Resources	• For level of AP classification: ○ Simple = I A-B ○ Moderate = I-C, IIA-C ○ Complex = I-II D, III A-D • Lui GK, Saidi A, Bhatt AB, et al. Diagnosis and management of noncardiac complications in adults with congenital heart disease: A scientific statement from the American Heart Association. *Circulation*. 2017;136(20):e348-e392. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000535?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed. 2021. • Rychik J, Atz AM, Celermajer DS, et al. Evaluation and management of the child and adult with fontan circulation: A scientific statement from the American Heart Association. *Circulation*. 2019;140:e234-e284. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000696. 2021. • Stout KK, Daniels CJ, Aboulhosn JA, et al. Correction to: 2018 AHA/ACC guideline for the management of adults with congenital heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation.* 2019;139(14):e833-e834. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000683. 2021.

Patient Care 5: Pregnancy/Contraception **Overall Intent:** To provide disease-specific recommendations for pregnancy and contraception and to formulate management plans before, during, and after delivery	
Milestones	**Examples**
Level 1 *Recognizes risks/benefits of different contraception methods, and provides general family planning and contraception education to patients with ACHD* *Applies ACHD complexity and pregnancy risk-stratification models in evaluation of pregnancy risk* *Formulates plans for surveillance of cardiac disease during pregnancy, formulates delivery plans, and participates in peri- and postpartum cardiovascular care, with guidance*	• Recognizes which methods of contraception contain estrogen and the potential side effects of estrogen; provides general counseling about contraception and education at the level of an internist, but is not yet able to tailor counseling towards individual patients based on their adult congenital heart disease risks • Is familiar with the adult congenital heart disease anatomic and physiological classification, and applies Cardiac Disease in Pregnancy Study (i.e., CARPREG), Zwangerschap bij Aangeboren HARtAfwijking (ZAHARA), and/or modified World Health Organization (i.e., WHO) risk stratification models to a patient with Fontan palliation, but is not yet able to provide counseling to the patient • Requires significant attending guidance to determine a cardiology-focused delivery plan for a pregnant patient with Fontan palliation
Level 2 *With direct supervision, provides disease-specific counseling on methods of contraception, including discussion of risks/benefits for patients with simple complexity ACHD* *With direct supervision, provides individualized counseling about maternal risk and fetal outcomes to patients with ACHD* *With direct supervision, formulates care plans for low complexity pregnant patients with ACHD, formulates a delivery plan, and participates in peri- and postpartum cardiovascular care*	• Provides counseling on contraception and family planning for a patient with an isolated small atrial septal defect, with the attending present in the exam room • Provides individualized counseling about risk of pregnancy to a patient with repaired Tetralogy of Fallot, with the attending present in the exam room • Formulates a cardiology-focused delivery plan for a patient with an isolated small atrial septal defect, though requires input from the attending
Level 3 *With indirect supervision, provides disease-specific counseling on methods of contraception, including discussion of*	• Provides counseling on contraception and family planning for a patient with repaired atrioventricular septal defect; the attending provides guidance to the fellow outside of the exam room and does not need to be in the exam room for counseling

risks/benefits for patients with moderate complexity ACHD *With indirect supervision, provides individualized counseling about maternal risk and fetal outcomes to patients with ACHD* *With indirect supervision, formulates care plans for pregnant patients with moderate complexity ACHD, formulates a delivery plan, and participates in peri- and postpartum cardiovascular care*	• Provides counseling about risk of pregnancy and inheritability for a patient with repaired atrioventricular septal defect; the attending provides guidance to the fellow outside of the exam room and does not need to be in the exam room for counseling • Determines a cardiology-focused delivery plan for a patient with repaired atrioventricular septal defect, with minimal input from the attending
Level 4 *Independently provides disease-specific counseling on methods of contraception, including discussion of risks/benefits for patients with all levels of ACHD complexity* *Independently provides individualized counseling about maternal risk and fetal outcomes to patients with ACHD* *For pregnant patients with all levels of ACHD complexity, independently formulates care plans, formulates delivery plans, and participates in peri- and postpartum cardiovascular care*	• Provides counseling on contraception and family planning for a patient with Fontan without requiring additional input from the attending • Provides individualized counseling about risk of pregnancy for a patient with Fontan, including potential long-term risks such as the risk of sensitization, without requiring additional input from the attending • Creates an individualized care plan for a pregnant patient with Fontan throughout pregnancy, peripartum, and postpartum, with minimal additional input from the attending
Level 5 *Leads patients in shared decision-making conversations about family planning and methods of contraception, including discussion of risks/benefits* *Leads patients/families in shared decision-making conversations about pregnancy risk* *For all pregnant patients with ACHD, including high complexity patients, independently formulates care plans, formulates delivery plans,*	• Skillfully leads shared decision making conversations with patients with Marfan syndrome about family planning and pregnancy risk • Leads shared decision-making conversations about pregnancy risk with a patient with Marfan syndrome and a dilated aorta without requiring additional input from the attending • Creates an individualized care plan for a pregnant patient with Marfan syndrome and a dilated aorta throughout pregnancy, peripartum, and postpartum, without additional input from the attending

and participates in peri- and postpartum cardiovascular care	
Assessment Models or Tools	• Direct observation • Medical record (chart) review • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• For level of AP classification: ○ Simple = I A-B ○ Moderate = I-C, IIA-C ○ Complex = I-II D, III A-D • Canobbio MM, Warnes CA, Aboulhosn J, et al. Management of pregnancy in patients with complex congenital heart disease: A scientific statement for healthcare professionals from the American Heart Association. *Circulation*. 2017;135(8):e50-e87. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000458?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed. 2021.

Medical Knowledge 1: Imaging **Overall Intent:** To understand the indications, limitations, appropriate guideline directed intervals, and results of echocardiogram, cardiac CT, and cardiac MRI in congenital heart disease patients with any level of complexity	
Milestones	**Examples**
Level 1 *Recognizes the indications, contraindications, limitations, and appropriate guideline-directed time intervals of imaging studies*	• Knows when to get a CT versus MRI versus angiography versus transesophageal echocardiography • Understands complications of contrast including renal failure • Knows that time intervals of imaging studies are guided by AP classification
Level 2 *Identifies native and post-surgical anatomy and understands hemodynamic implications of various imaging studies for patients with simple complexity ACHD*	• Identifies device position, residual shunt, right ventricular dilation, Qp:Qs in a patient with an atrial septal defect
Level 3 *Identifies native and post-surgical anatomy and understands hemodynamic implications of various imaging studies for patients with moderate complexity ACHD*	• Identifies Fontan circulation patency, ventricular function, and venous-venous collaterals in a patient with single ventricle physiology
Level 4 *Identifies native and post-surgical anatomy and understands hemodynamic implications of various imaging studies for patients with any ACHD complexity*	• Identifies right ventricular dilation, degree of PR, and right ventricular function of a patient with repaired tetralogy of Fallot
Level 5 Identifies, teaches, and presents knowledge of challenging imaging studies of patients with any level of ACHD complexity	• Reviews and identifies systemic venous, pulmonary venous baffle patency, ventricular function, baffle leak on a dextro-transposition of the great arteries Mustard patient
Assessment Models or Tools	• Assessment of case-based discussion • Case log • Direct observation • Multisource feedback
Curriculum Mapping	•

Notes or Resources	• For level of AP classification:
	  ○ Simple = I A-B
	  ○ Moderate = I-C, IIA-C
	  ○ Complex = I-II D, III A-D
	• Sachdeva R, Valente AM, Armstrong AK, et al. ACC/AHA/ASE/HRS/ISACHD/SCAI/SCCT/SCMR/SOPE 2020 appropriate use criteria for multimodality imaging during the follow-up care of patients with congenital heart disease: A report of the American College of Cardiology Solution Set Oversight Committee and

	Appropriate Use Criteria Task Force, American Heart Association, American Society of Echocardiography, Heart Rhythm Society, International Society for Adult Congenital Heart Disease, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Pediatric Echocardiography. *J Am Coll Cardiol*. 2020;75(6):657-703. https://www.sciencedirect.com/science/article/pii/S073510971937812X?via%3Dihub. 2021. • Stout KK, Daniels CJ, Aboulhosn JA, et al. Correction to: 2018 AHA/ACC guideline for the management of adults with congenital heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation.* 2019;139(14):e833-e834. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000683. 2021.

Medical Knowledge 2: Critical Thinking for Diagnosis and Therapy **Overall Intent:** To diagnose rare presentations and disorders and appropriately adapt treatment plans	
Milestones	**Examples**
Level 1 *Identifies complexities of ACHD and implications on differential diagnosis, comorbidities, and diagnostic plan*	• Identifies some of the implications of an atrial septal defect on differential diagnosis of a patient with potential cardiac symptoms
Level 2 *Diagnoses simple ACHD and creates a therapeutic plan based on comorbidities, patient data, and guidelines*	• Understands physiology and consequences of atrial septal defects and creates a diagnostic and therapeutic plan for a patient with an atrial septal defect
Level 3 *Diagnoses moderate complexity ACHD and creates a therapeutic plan based on comorbidities, patient data, and guidelines*	• Understands physiology and consequences of repaired tetralogy of Fallot, and creates a diagnostic and therapeutic plan for a patient with repaired tetralogy of Fallot
Level 4 *Diagnoses any ACHD complexity and creates a therapeutic plan based on comorbidities, patient data, and guidelines*	• Understands physiology and consequences of Fontan palliation and associated comorbidities (e.g., liver disease) and creates a diagnostic and therapeutic plan for a patient with a Fontan palliation
Level 5 *Diagnoses, teaches, and presents knowledge of challenging presentations of patients with any level of ACHD complexity*	• Has a comprehensive understanding of the spectrum of adult congenital heart disease, and presents, manages, and teaches about any adult congenital heart disease topic
Assessment Models or Tools	• Assessment of case-based discussion • Direct observation • End-of-rotation evaluation • Evaluation of conference participation • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• For level of AP classification: ○ Simple = I A-B ○ Moderate = I-C, IIA-C ○ Complex = I-II D, III A-D • The Society to Improve Diagnosis in Medicine. Inter-Professional Consensus Curriculum on Diagnosis and Diagnostic Error. https://www.improvediagnosis.org/competency-summary-list/. 2021. • The Society to Improve Diagnosis in Medicine. Driver Diagram. https://www.improvediagnosis.org/wp-content/uploads/2018/10/Driver_Diagram_-_July_31_-_M.pdf. 2021.

	• The Society to Improve Diagnosis in Medicine. Assessment of Reasoning Tool. https://www.improvediagnosis.org/art/. 2021. • Stout KK, Daniels CJ, Aboulhosn JA, et al. Correction to: 2018 AHA/ACC guideline for the management of adults with congenital heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation.* 2019;139(14):e833-e834. https://www.ahajournals.org/doi/10.1161/CIR.0000000000000683. 2021.

Systems-Based Practice 1: Patient Safety and Quality Improvement (QI) **Overall Intent:** To engage in the analysis and management of patient safety events, including relevant communication with patients, families, and health care professionals; to conduct a QI project	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of common patient safety events*	• Describes an event in which a medication was not given as appropriate
Demonstrates knowledge of how to report patient safety events	• Demonstrates familiarity with the institutional reporting system
Demonstrates knowledge of basic quality improvement methodologies and metrics	• Discusses the steps of a QI protocol
Level 2 *Identifies system factors that lead to patient safety events*	• Identifies that computer order entry and team communication are factors for a missed medication
Reports patient safety events through institutional reporting systems (simulated or actual)	• Reports missed medication in the institutional reporting system
Describes quality improvement initiatives at the institutional or departmental level	• Describes an initiative to develop an order set to avoid medication error
Level 3 *Participates in analysis of patient safety events (simulated or actual)*	• Prepares for morbidity and mortality presentations
Participates in disclosure of patient safety events to patients and families (simulated or actual)	• Participates in communication with patients/families about an adverse event
Participates in quality improvement initiatives at the institutional or departmental level	• Participates in a QI project, but may not have designed a QI project yet
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)*	• Collaborates with a team to lead the analysis of a patient safety event
Discloses patient safety events to patients and families (simulated or actual)	• Competently communicates with patients/families about an adverse event

Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project	• Initiates a QI project within the cardiology division or department
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* *Creates, implements, and assesses quality improvement initiatives at the institutional or community level*	• Competently assumes a leadership role at the institutional or community level for patient safety • Leads a simulation exercise to disclose adverse events • Completes a QI project and implements changes within the institution
Assessment Models or Tools	• Chart or other system documentation by fellow • Direct observation • Documentation of QI or patient safety project processes or outcomes • E-module multiple choice tests • Multisource feedback • QI or M and M conference evaluation • Simulation
Curriculum Mapping	•
Notes or Resources	• Institute for Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. 2021.

Systems-Based Practice 2: System Navigation for Patient-Centered Care **Overall Intent:** To effectively navigate the health care system, including the interdisciplinary team and other care providers; to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	**Examples**
Level 1 *Demonstrates knowledge of care coordination*	• Identifies the various members of the health care team and defines their roles
Identifies key elements for effective transitions of care	• Lists the essential components of an effective sign-out and care transition
Level 2 *Coordinates care of patients in routine clinical situations, effectively using the roles of the interprofessional team members*	• Contacts health care team members for routine cases, but requires supervision to ensure all necessary referrals, testing, and care transitions are made
Performs effective transitions of care in routine clinical situations	• Performs a routine case sign-out but still needs guidance and direct supervision to identify and appropriately triage cases or calls
Demonstrates general knowledge of financial, cultural, and social barriers to adherence to care	• Identifies components of social determinants of health and how they impact the delivery of patient care
Level 3 *Coordinates care of patients in complex clinical situations, effectively using the roles of the interprofessional team members*	• Uses care coordinators to help maintain target blood pressure values for patients with aortic coarctation and hypertension
Performs effective transitions of care in complex clinical situations	• Performs safe and effective transitions of care with clinical service at shift change
Identifies financial, cultural, and social barriers to adherence to care for specific populations	• Knows which patients are at high risk for specific health outcomes related to health literacy concerns, cost of testing or therapy, LGBTQ status, etc.
Level 4 *Role models effective coordination of patient-centered care among different disciplines and specialties*	• Role models and educates students and junior team members regarding the engagement of appropriate interprofessional team members and ensures the necessary resources have been arranged
Role models and advocates for effective transitions of care within and across health care delivery systems	• Mentors learners on effective transitions from the inpatient to outpatient setting
Adapts practice to address the financial, cultural, and social barriers to adherence to care	• Ensures patients are prescribed medications that can be affordably obtained

Level 5 *Analyzes the process of care coordination and leads in the design and implementation of improvements* *Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes* *Leads innovations and advocates for populations with health care inequities*	• Works with hospital or ambulatory site team members or leadership to analyze care coordination in that setting, and takes a leadership role in designing and implementing changes to improve the care coordination • Works with a QI mentor to identify better hand-off tools for on-call services • Designs a social determinants of health curriculum to help others learn to identify local resources and barriers to care and laboratory testing • Helps develop telehealth program to ensure that patients in rural areas can be seen by electrophysiology specialists
Assessment Models or Tools	• Case management quality metrics and goals mined from electronic health records (EHRs) • Direct observation • Evaluation of interdisciplinary rounds for high-risk patients/cases • Evaluation of lectures/workshops on social determinants of health or population health with identification of local resources • Medical record (chart) review • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• Adams C. In pursuit of patient-centered care. *MLO*. 2016;48(4):48. https://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns. 2021. • CDC. Population Health Training in Place Program. https://www.cdc.gov/pophealthtraining/whatis.html. 2021. • Skochelak SE, Hawkins RE, Lawson LE, Starr SR, Borkan JM, Gonzalo JD. *AMA Education Consortium: Health Systems Science*. 1st ed. Philadelphia, PA: Elsevier; 2016. https://commerce.ama-assn.org/store/ui/catalog/productDetail?product_id=prod2780003. 2021.

Systems-Based Practice 3: 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 health care systems (e.g., hospitals, skilled nursing facility, finance, personnel, technology)* *Describes basic health payment systems, (e.g., government, private, public, uninsured care) and practice models*	• Recognizes that hospitals, skilled nursing facilities, and technology are components of the health care system and describes different payment systems, such as Medicare, Medicaid, Veterans Affairs (VA), and commercial third-party payers • Shows understanding of how the differences between payment models influences patient preferences and access
Level 2 *Describes how components of a complex health care system are interrelated, and how this impacts patient care* *Delivers care with consideration of each patient's payment model (e.g., insurance type)* *Demonstrates essential skills for documentation required for independent practice (e.g., electronic health record, documentation required for billing and coding)*	• Describes how improving patient satisfaction improves patient care and disease management • Selects anticoagulation medication taking into consideration the options within the specific patient's health insurance plan • Completes a note template following a routine patient encounter and applies appropriate coding in compliance with regulations
Level 3 *Discusses how individual practice affects the broader system (e.g., length of stay, readmission rates, clinical efficiency)* *Engages with patients in shared decision making, informed by each patient's payment model* *Seeks knowledge of non-clinical topics needed for independent practice (e.g., malpractice insurance, government regulation, compliance)*	• Works with the hospital system to coordinate the proper imaging studies for patients with various forms of congenital heart disease • Forms a therapeutic plan taking into consideration the patient's out-of-pocket expenses • Attends educational programs on accurate medical billing
Level 4 *Manages various components of the complex health care system to provide efficient and effective patient care and transition of care*	• Uses electronic communication tools for effective transition of care to another health care provider

Advocates for patient care needs (e.g., community resources, patient assistance resources) with consideration of the limitations of each patient's payment model	• Adopts use of patient assistance programs for drug prescriptions by pharmaceutical companies
Applies knowledge of non-clinical topics needed for independent practice (e.g., distinctions among adult, pediatric, and/or combined hospitals)	• Identifies modifier codes to improve the accuracy of documentation for dedicated ACHD imaging studies
Level 5 *Advocates for or leads systems change that enhances high-value, efficient, and effective patient care and transitions of care*	• Advocates for timely transition of adult congenital heart disease patients from pediatric to adult clinics
Participates in health policy advocacy activities	• Participates in activities of the American Heart Association to support government interventions that promote health
Educates others in non-clinical topics to prepare them for independent practice	• Lectures to division/department on topics such as medical billing/coding, ethics, and risk management
Assessment Models or Tools	• Direct observation • Medical record (chart) review • QI project
Curriculum Mapping	•
Notes or Resources	• Agency for Healthcare Research and Quality (AHRQ). Major Physician Measurement Sets. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/measurementsets.html. 2021. • AHRQ. Measuring the Quality of Physician Care. https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/challenges.html. 2021. • American Board of Internal Medicine. QI/PI activities. http://www.abim.org/maintenance-of-certification/earning-points/practice-assessment.aspx. 2021. • Dzau VJ, McClellan M, Burke S, et al. Vital directions for health and health care: priorities form a national academy of medicine initiative. *JAMA*. 2017;317(14):1461-1470. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. 2021. • The Kaiser Family Foundation. www.kff.org. 2021. • The Kaiser Family Foundation. Health Reform. https://www.kff.org/topic/health-reform/. 2021.

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 to manage a patient with ACHD*	• Obtains evidence-based guidelines for management of a patient with Fontan palliation
Level 2 *Articulates clinical questions and elicits patient preferences to guide evidence-based care*	• Asks symptom-driven and goals-of-care questions of a patient with Fontan palliation
Level 3 *Locates and applies the best available evidence to the care of patients with ACHD while integrating patient preference*	• Applies evidence in the care of a patient with Fontan palliation and heart failure symptoms • Researches and evaluates relevant comorbidities in the evaluation of a patient with Fontan palliation
Level 4 *Critically appraises and applies available, potentially conflicting evidence to guide care of an individual patient*	• Researches and synthesizes available data for the role of catheter-based and surgical interventions, medication therapy, mechanical support, and transplant in a patient with Fontan palliation
Level 5 *Develops initiatives to educate others to critically appraise and apply evidence for complex patients and/or participates in the development of guidelines*	• Teaches others how to find and apply best practice • Participates in the development of practice plans or clinical guidelines on the management of patient with Fontan palliation • Helps write a multi-team policy for the institution to address care of the patient with Fontan palliation
Assessment Models or Tools	• Direct observation • Electrophysiology in-service examination • QI meetings • Review of presentations/publications
Curriculum Mapping	•
Notes or Resources	• Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: Practice-based learning and improvement. *Acad Pediatr*. 2014;14(2 Suppl):S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/fulltext. 2021. • Harrington RA, Barac A, Brush JE Jr, et al. COCATS 4 Task Force 15: Training in cardiovascular research and scholarly activity. *J Am Coll Cardiol*. 2015;65(17):1899-1906. https://www.sciencedirect.com/science/article/pii/S0735109715008396?via%3Dihub. 2021. • NEJM Knowledge. Exploring the ACGME Core Competencies: Practice-Based Learning and Improvement. https://knowledgeplus.nejm.org/blog/practice-based-learning-and-improvement/. 2021.

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth **Overall Intent:** To seek performance information with the intent to improve care; to reflect on all domains of practice and develop goals for improvement	
Milestones	**Examples**
Level 1 *Accepts responsibility for personal and professional development by establishing goals* *Acknowledges limits and gaps between expectations and performance; demonstrates self-awareness*	• Sets goal to independently interpret hemodynamic catheterization results in a patient with Fontan palliation • Acknowledges need to improve skills in cardiac catheterization
Level 2 *Demonstrates openness to feedback and performance data to form goals* *Analyzes the factors that contribute to limits and gaps; demonstrates appropriate help-seeking behaviors*	• Incorporates attending physician suggestion for interpreting results of a cardiac catheterization • Appreciates need to perform a high number of cardiac catheterizations to build troubleshooting skills
Level 3 *Occasionally seeks feedback and performance data with adaptability and humility* *Creates and implements a learning plan*	• Presents a case of a patient with failing Fontan physiology to faculty for discussion and feedback • Devises a learning plan to address need to improve cardiac catheterization skills
Level 4 *Systematically seeks feedback and performance data with adaptability and humility* *Uses performance data to assess learning plan and improves it when necessary*	• Routinely asks attending about performance and opportunities for improvement • Analyzes cardiac catheterization logs to determine need for tailored educational experience
Level 5 *Coaches others to seek feedback and performance data* *Facilitates the design and implementation of learning plans for others*	• Mentors a cardiology fellow in preparation of an adult congenital heart disease clinical conference case presentation in how to successfully obtain feedback from attendings • Develops a method that all fellows can use to document and implement a learning plan
Assessment Models or Tools	• Direct observation • End-of-rotation evaluations • Review of learning plan
Curriculum Mapping	•
Notes or Resources	• Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: practice-based learning and improvement. *Acad Pediatr*. 2014;14(2 Suppl):S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/fulltext. 2021.

	• Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. *Acad Med.* 2009;84(8):1066-74. https://insights.ovid.com/crossref?an=00001888-200908000-00021. 2021. • Lockspeiser TM, Schmitter PA, Lane JL, Hanson JL, Rosenberg AA, Park YS. Assessing residents' written learning goals and goal writing skill: Validity evidence for the learning goal scoring rubric. *Acad Med*. 2013;88(10):1558-1563. https://insights.ovid.com/article/00001888-201310000-00039. 2021.

Professionalism 1: Professional Behavior and Ethical Principles **Overall Intent:** To recognize and address lapses as well as opportunities to improve ethical and professional behavior	
Milestones	**Examples**
Level 1 *Identifies and describes potential triggers for professionalism lapses* *Demonstrates knowledge of ethical principles (e.g., informed consent, advance directives, confidentiality, patient autonomy, equity)*	• Recognizes signs of fatigue and impact on appropriate and timely completion of responsibilities • Discusses the basic principles underlying ethics (beneficence, nonmaleficence, justice, autonomy) and professionalism (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* *Applies knowledge of ethical principles to routine situations*	• Acknowledges a lapse without becoming defensive, making excuses, or blaming others • Apologizes for the lapse when appropriate and takes steps to make amends if needed • Articulates strategies for preventing similar lapses in the future • Respects patient autonomy in discussion about decision making for a primary prevention implantable cardioverter defibrillator
Level 3 *Demonstrates professional behavior in complex or stressful situations* *Recognizes need to seek help in managing and resolving complex ethical situations*	• Behaves respectfully and calmly during an interaction between the health care team and a distraught or angry family member • Recognizes own limitations and seeks resources to help manage and resolve complex ethical situations such as cessation of implantable device therapy
Level 4 *Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in oneself and others* *Uses appropriate resources for managing and resolving ethical dilemmas (e.g., ethics consultations, risk management)*	• Models respect for patients and expects the same from others • Successfully leads a difficult conversation between the health care team and a distraught or angry family member • Outlines and responds to possible ethical issues when writing and submitting an Institutional Review Board proposal • Anticipates the need to seek additional resources to prevent ethical dilemmas
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*	• Seeks opportunities to provide appropriate feedback on professionalism to other members of the health care team • Engages in system-wide efforts to improve professionalism through participation in a work group, committee, or task force
Assessment Models or Tools	• Direct observation • Multisource feedback

	• Oral or written self-reflection (e.g., of a personal or observed lapse, ethical dilemma, or systems-level factors) • Simulation
Curriculum Mapping	•
Notes or Resources	• ABIM Foundation, ACP-ASIM Foundation, European Federation of Internal Medicine. Medical professionalism in the new millennium: A physician charter. *Annals of Internal Medicine*. 2002;136(3):243-246. https://annals.org/aim/fullarticle/474090/medical-professionalism-new-millennium-physician-charter. 2021. • American Medical Association. Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. 2021. • Bynny RL, Paauw DS, Papadakis MA, Pfeil S, Alpha Omega Alpha. *Medical Professionalism Best Practices: Professionalism in the Modern Era.* Menlo Park, CA: Alpha Omega Alpha Honor Medical Society; 2017. http://alphaomegaalpha.org/pdfs/Monograph2018.pdf. 2021. • 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(2):215-219. https://www.archivesofpathology.org/doi/10.5858/arpa.2016-0217-CP?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. 2021. • Levinson W, Ginsburg S, Hafferty FW, Lucey CR. *Understanding Medical Professionalism*. 1st ed. New York, NY: McGraw-Hill Education; 2014. https://accessmedicine.mhmedical.com/book.aspx?bookID=1058. 2021.

Professionalism 2: Accountability **Overall Intent:** To take responsibility for one's own actions and the impact on patients and other members of the health care team, as well as recognizes and manages potential conflicts of interest	
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*	• Responds promptly to reminders from program administrator to complete procedure and work hour logs, and sets calendar reminders to submit
Recognizes the principles of conflict of interest in relationships with industry and other entities	• Understands the potential conflict of interests in relationships with pharmaceutical and device companies
Level 2 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations*	• Completes procedure notes and post-procedure orders before leaving the catheterization lab
Recognizes personal potential conflicts with industry	• Understands that receiving books and other educational resources from pharmaceutical and device companies may lead to a conflict of interest
Level 3 *Performs tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations*	• Appropriately communicates events and recommendations for care following an emergent procedure
Seeks assistance in managing personal relationships with industry and other entities to minimize bias and undue influence in practice	• In collaboration with peers and supervisors, reviews and critiques promotional materials provided by pharmaceutical and device representatives • Follows institutional policies regarding relationships with industry
Level 4 *Recognizes situations that may impact others' ability to complete tasks and responsibilities in a timely manner*	• Takes responsibility for timely coordination of all parties involved in a complex catheterization procedure
Identifies, discloses, and manages relationships with industry and other entities to minimize bias and undue influence in practice	• Independently reviews and critiques promotional materials provided by pharmaceutical and device representatives
Level 5 *Engages with the system to improve outcomes*	• Identifies and addresses team/system issues that impede efficient completion of patient care tasks (e.g., setting up a meeting with the nurse manager to streamline patient discharges)
Assessment Models or Tools	• Compliance with deadlines and timelines • Direct observation

	• Multisource feedback • Self-evaluations and reflective tools
Curriculum Mapping	•
Notes or Resources	• Code of conduct from fellow/resident institutional manual • Expectations of residency program regarding accountability and professionalism • O'Gara PT, Ness DL, Harold JG. Medical professionalism and the American College of Cardiology. *JACC CardioOnco*l. 2015;65(5):503-506. https://www.onlinejacc.org/content/65/5/503. 2021.

Professionalism 3: Self-Awareness and Well-Being **Overall Intent:** To identify, use, manage, improve, and seek help for personal and professional well-being for self and others	
Milestones	**Examples**
Level 1 *Recognizes the importance of personal and professional well-being*	• Schedules time for self-care
Level 2 *Independently recognizes status of personal and professional well-being*	• Identifies signs of burnout and recognizes that institutional resources are available
Level 3 *With assistance, proposes a plan to optimize personal and professional well-being, including identification of available resources*	• Uses digital tools to address sources of burnout
Level 4 *Independently develops a plan using available resources to optimize personal and professional well-being*	• Independently uses institutional resources to develop action plans for continued personal and professional growth and limit stress and burnout
Level 5 *Participates in a system change to improve well-being in oneself and others*	• Mentors patients and colleagues in self-awareness and establishes health management plans to limit stress and burnout
Assessment Models or Tools	• Direct observation • Group interview or discussions for team activities • Individual interview • Institutional online training modules • Participation in institutional well-being programs • 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 affect well-being, the mechanisms by which those factors affect well-being, and available resources and tools to improve well-being. • ACGME. "Well-Being Tools and Resources." https://dl.acgme.org/pages/well-being-tools-resources. Accessed 2022. • Hicks PJ, Schumacher D, Guralnick S, Carraccio C, Burke AE. Domain of competence: Personal and professional development. *Acad Pediatr.* 2014;14(2 Suppl):S80-97. https://www.academicpedsjnl.net/article/S1876-2859(13)00332-X/fulltext. 2021. • Local resources, including Employee Assistance Plan (EAP)

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication **Overall Intent:** To use language and behaviors to form constructive relationships with patients, identifies communication barriers including self-reflection on personal biases, and minimizes them in the doctor-patient relationships; to organize and lead communication around shared decision making	
Milestones	**Examples**
Level 1 *Demonstrates respect and establishes rapport in patient encounters* *Knows barriers to effective communication (e.g., language, disability, health literacy, cultural differences, personal bias)* *Identifies the need to adjust communication strategies to succeed in shared decision making*	• Self-monitors and controls tone, non-verbal responses, and language • Asks questions to invite patient/family participation • Lists health literacy as a common communication barrier • Avoids medical jargon when talking to patients
Level 2 *Establishes a therapeutic relationship in routine patient encounters* *Identifies barriers to effective communication in patient encounters* *Organizes and initiates communication with patients and their families to facilitate shared decision making*	• Develops a professional relationship with patients/families, with active listening and attention to communication barriers in patient and family encounters • Schedules interpreter to be present during patient and family meeting when English is not the patient's preferred language • Takes the lead in organizing a meeting time and agenda with the patient, family, and consulting teams; begins the meeting, reassessing patient and family understanding
Level 3 *With guidance, establishes a therapeutic relationship in challenging patient encounters* *Attempts to minimize communication barriers, including reflection on any personal biases* *With guidance, uses shared decision making to implement a personalized care plan*	• Identifies how personal biases may impact the patient-doctor relationship • Defuses anger of unhappy patient with some attending assistance • Reflects on implicit biases when prompted • Elicits what is most important to the patient and family, and acknowledges uncertainty in the medical complexity and prognosis
Level 4 *Independently establishes a therapeutic relationship in challenging patient encounters* *Proactively minimizes communication barriers and independently manages personal biases*	• Navigates a challenging therapeutic relationship when patient and family have conflicting priorities • Identifies a bias against patients who do not address their modifiable risk factors

Independently uses shared decision making to implement a personalized care plan	• Engages in shared decision making with the patient and family members of an elderly patient who declines a pacemaker
Level 5 *Mentors others in situational awareness and critical self-reflection to consistently develop positive therapeutic relationships* *Role models self-awareness to minimize communication barriers* *Role models shared decision making*	• Develops a workshop for colleagues in self-awareness and reflection to improve therapeutic relationships with patients • Role models proactive self-awareness and reflection around explicit and implicit biases with a context specific approach to mitigate communication barriers • Is an example to others of leading shared decision making to arrive at consensus
Assessment Models or Tools	• Direct observation • Multisource feedback • Self-assessment including self-reflection exercises • Standardized patients or structured case discussions
Curriculum Mapping	•
Notes or Resources	• Braddock CH III, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: Time to get back to basics. *JAMA*. 1999;282(24):2313-2320. https://jamanetwork.com/journals/jama/fullarticle/192233. 2021. • 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.researchgate.net/publication/49706184_Communication_skills_An_essential_component_of_medical_curricula_Part_I_Assessment_of_clinical_communication_AMEE_Guide_No_511. 2021. • Lane JL, Gottlieb RP. Structured clinical observations: A method to teach clinical skills with limited time and financial resources. *Pediatrics*. 2000;105(4 Pt 2):973-977. https://www.ncbi.nlm.nih.gov/pubmed/10742358. 2021. • Makoul G. Essential elements of communication in medical encounters: The Kalamazoo consensus statement. *Acad Med*. 2001;76(4):390-393. https://www.researchgate.net/publication/264544600_Essential_elements_of_communication_in_medical_encounters_The_Kalamazoo_Consensus_Statement. 2021. • Makoul G. The SEGUE Framework for teaching and assessing communication skills. *Patient Educ Couns*. 2001;45(1):23-34. https://www.researchgate.net/publication/11748796_The_SEGUE_Framework_for_teaching_and_assessing_communication_skills. 2021.

	• Symons AB, Swanson A, McGuigan D, Orrange S, Akl EA. A tool for self-assessment of communication skills and professionalism in residents. *BMC Med Educ*. 2009;9:1. https://bmcmededuc.biomedcentral.com/articles/10.1186/1472-6920-9-1. 2021.

Interpersonal and Communication Skills 2: Interprofessional and Team Communication **Overall Intent:** To effectively communicate with the health care team, including consultants, in both routine and complex situations	
Milestones	**Examples**
Level 1 *Respectfully receives a consultation request*	• Shows respect through words and actions when receiving calls for assistance
Uses language that values all members of the health care team	• Uses respectful communication in all interactions • Listens to and considers others' points of view, is nonjudgmental and actively engaged, and demonstrates humility
Level 2 *With direct supervision, respectfully and thoroughly completes consultations with effective documentation and communication in common cases*	• Communicates clearly and concisely in an organized and timely manner during consultant encounters, as well as with the health care team in general
Communicates information effectively with all health care team members	• Uses clear, concise, organized, and timely oral and written communication
Participates in team-based discussions to optimize team performance	• Participates in multidisciplinary discussions to advance patient care plans
Level 3 *With indirect supervision, completes consultations with effective documentation and communication in common cases*	• Performs consult for a patient with Fontan palliation and communicates recommendations to the team with oversight
Adapts communication style to fit team needs	• Uses respectful strategies to assess understanding of the consultation question
Initiates team-based discussions to optimize team performance	• Arranges and facilitates multidisciplinary discussions regarding treatment
Level 4 *Completes consultations with effective documentation and communication in complex cases*	• Performs detailed consult and ensures management for a patient with failing Fontan in the critical care unit
Coordinates recommendations from different members of the health care team to optimize patient care	• Communicates recommendations effectively and in a timely manner with primary care and other referring or collaborating members of the health care team, coordinates with cardiac catheterization lab on procedural timing

Facilitates team-based discussions to optimize team performance	• Arranges and contributes to multidisciplinary discussions regarding treatment for complex cases
Level 5 *Role models flexible communication strategies that value input from all health care team members, resolving conflict when needed* *Facilitates regular health care team-based feedback in complex situations*	• Includes evidence-based references when completing consultation notes • Guides others in organizing effective team meetings to resolve conflict • Organizes debrief after an unexpected patient death • Respectfully provides feedback to more junior members of the medical team for the purposes of improvement or reinforcement of correct knowledge, skills, and attitude
Assessment Models or Tools	• Direct observation • Medical record (chart) review • Multisource feedback • Simulation
Curriculum Mapping	•
Notes or Resources	• Braddock CH III, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practice: Time to get back to basics. *JAMA*. 1999;282(24):2313-2320. https://jamanetwork.com/journals/jama/fullarticle/192233. 2021. • Dehon E, Simpson K, Fowler D, Jones A. Development of the faculty 360. *MedEdPORTAL*. 2015;11:10174. https://www.mededportal.org/publication/10174/. 2021. • Fay D, Mazzone M, Douglas L, Ambuel B. A validated, behavior-based evaluation instrument for family medicine residents. *MedEdPORTAL*. 2007. https://www.mededportal.org/publication/622/. 2021. • François J. Tool to assess the quality of consultation and referral request letters in family medicine. *Can Fam Physician*. 2011;57(5):574–575. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093595/. 2021. • Green M, Parrott T, Cook G. Improving your communication skills. *BMJ*. 2012;344:e357. https://www.bmj.com/content/344/bmj.e357. 2021. • 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. 2021. • Lane JL, Gottlieb RP. Structured clinical observations: A method to teach clinical skills with limited time and financial resources. *Pediatrics*. 2000;105(4 Pt 2):973-977. https://www.ncbi.nlm.nih.gov/pubmed/10742358. 2021.

	• 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. 2021.

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 and safeguards patients' personal health information*	• Notes are accurate but may lack organization and include extraneous information • Shreds patient notes after rounding as one method of maintaining Health Insurance Portability and Accountability Act (HIPAA) compliance
Level 2 *Demonstrates organized diagnostic and therapeutic reasoning through notes in the patient record* *Identifies appropriate communication channels (e.g., cell phone/pager, medical record, email) as required by institutional policy*	• Notes are organized and accurate but may still contain extraneous information • Identifies proper methods for sharing results needing urgent attention
Level 3 *Concisely reports diagnostic and therapeutic reasoning in the patient record* *Respectfully communicates concerns about the system*	• Documentation is accurate, organized, and concise, but may not consistently contain anticipatory guidance • Communicates opportunities for EHR interface improvement
Level 4 *Independently communicates timely information in a written format and verbally when appropriate* *Uses appropriate channels to offer clear and constructive suggestions to improve the system*	• Writes a clear and concise note that includes anticipatory guidance and verbally transmits critical information to a colleague • Knows when to call the treating team about unexpected or critical findings of clinical significance • Participates in house staff QI committee to update policy for anticoagulation for cardioversion • Recognizes when a communication breakdown has happened and respectfully brings the issue to the attention of the attending
Level 5 *Models written communication to improve others' performance* *Guides departmental or institutional communication around policies and procedures*	• Leads a task force established by the hospital QI committee to develop a plan to improve house staff hand-offs • Teaches colleagues how to improve discharge summaries
Assessment Models or Tools	• Direct observation • Medical record (chart) review • Multisource feedback
Curriculum Mapping	•

Notes or Resources	• Bierman JA, Hufmeyer KK, Liss DT, Weaver AC, Heiman HL. Promoting responsible electronic documentation: validity evidence for a checklist to assess progress notes in the electronic health record. *Teach Learn Med.* 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. 2021. • 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.ncbi.nlm.nih.gov/pubmed/16617948. 2021. • Starmer AJ, Spector ND, Srivastava R, et al. I-PASS, a mnemonic to standardize verbal handoffs. *Pediatrics*. 2012;129(2):201-204. https://ipassinstitute.com/wp-content/uploads/2016/06/I-PASS-mnemonic.pdf. 2021.

Interpersonal and Communication Skills 4: Complex Communication Around Serious Illness **Overall Intent:** To sensitively and effectively communicate about serious illness with patients and their families/caregivers, promoting shared decision making and assessing the evolving impact on all involved	
Milestones	**Examples**
Level 1 *Identifies communication about prognosis as a key element for shared decision making* *Identifies the need to assess the patient's/patient's family's expectations and understanding of their health status and treatment options*	• Recognizes importance of communicating prognosis to permit shared decision making but unable to do so independently • Values assessing patient/family understanding of health status and expectations but unable to consistently do so independently
Level 2 *Assesses the patient's family's/caregiver's prognostic awareness and identifies preferences for receiving prognostic information* *Facilitates communication with the patient/patient's family by introducing stakeholders, setting the agenda, clarifying expectations, and verifying an understanding of the clinical situation*	• Using open-ended questions, can determine a patient's/family's prognostic awareness and discuss patient/family preferences for how communication about prognosis should occur • Begins a family meeting for a patient with acute respiratory distress syndrome by asking the patient/family what they understand about their clinical condition
Level 3 *Delivers prognostic information and attends to emotional responses of patients and patients' families/caregivers* *Sensitively and compassionately delivers medical information; elicits the patient's/patient's family's values, goals, and preferences; acknowledges uncertainty and conflict, with guidance*	• Consistently responds to emotion in conversations by using NURSE (Name, Understand, Respect, Support, Explore) statements and deliberate silence • With a shared understanding of their medical condition, asks patients and families what is most important to them
Level 4 *Tailors communication of prognosis according to disease characteristics and trajectory, patient consent, patient's family's needs, and medical uncertainty, and addresses emotional response*	• Adjusts communication with family/caregivers to address uncertainty and conflicting prognostic estimates after a cardiac event • Run a family meeting with more complex emotions, family dynamics

Independently uses shared decision making to align the patient's/patient's family's values, goals, and preferences with treatment options to make a personalized care plan in situations with a high degree of uncertainty and conflict	• Independently develops and provides a recommendation for a time-limited trial of ventilator support for a patient with acute cardiac decompensation, in the context of conflicting patient and family goals
Level 5 *Coaches others in the communication of prognostic information* *Coaches shared decision making in communication with the patient's/patient's family*	• Develops a simulation module to teach communication of prognosis • Develops a role play to teach shared decision making
Assessment Models or Tools	• Direct observation • Objective structured clinical examination
Curriculum Mapping	•
Notes or Resources	• Back A, Arnold R, Tulsky J. *Mastering Communication with Seriously Ill Patients*. Cambridge: Cambridge University Press, 2009. ISBN:978-0521706186. • Back A, Arnold R, Baile W, Tulskey J, Fryer-Edwards K. Approaching difficult communication tasks in oncology. *CA Cancer J Clin*. 2005 May-Jun;55(3):164-77. https://acsjournals.onlinelibrary.wiley.com/doi/full/10.3322/canjclin.55.3.164?sid=nlm%3Apubmed. 2021. • Childers J, Back A, Tulsky J, Arnold M. REMAP: A framework for goals of care conversations. *J Oncol Pract*. 2017 Oct;13(10):e844-e850. https://pubmed.ncbi.nlm.nih.gov/28445100/. 2021. • Levetown M. Communicating with children and families: From everyday interactions to skill in conveying distressing information. *Pediatrics*. 2008; 121(5):e1441-60. https://pubmed.ncbi.nlm.nih.gov/18450887/. 2021. • VitalTalk. www.vitaltalk.org. 2021.

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

Milestones 1.0	Milestones 2.0
PC1: Gathers and synthesizes essential and accurate information to define each patient's clinical problem(s).	PC1: Inpatient Care PC2 Outpatient Care PC3: Heart Failure Management for Patients with ACHD
PC2: Develops and achieves comprehensive management plan for each patient.	PC1: Inpatient Care PC2: Outpatient Care PC3: Heart Failure Management for Patients with ACHD PC4: Transplant Mechanical Support Care PC5: Pregnancy/Contraception
PC3: Manages patients with progressive responsibility and independence	PC1: Inpatient Care PC2: Outpatient Care PC3: Heart Failure Management for Patients with ACHD PC4: Transplant Mechanical Support Care PC5: Pregnancy/Contraception
PC4a: Demonstrates skill in performing and interpreting invasive procedures	
PC4b; Demonstrates skill in performing and interpreting non-invasive procedures and/or testing	PC2: Outpatient Care PC4: Transplant Mechanical Support Care
PC5: Requests and provides consultative care	PC1: Inpatient Care PC5: Pregnancy/Contraception ICS2: Interprofessional and Team Communication ICS3: Communication within Health Care Systems
MK1: Possesses Clinical knowledge	MK2: Critical Thinking for Diagnosis and Therapy
MK2: Knowledge of diagnostic testing and procedures	MK1: Imaging
MK3: Scholarship	No match
SBP1: Works effectively within an interprofessional team	ICS2: Interprofessional and Team Communication
SBP2: Recognizes system error and advocates for system improvement	SBP1: Patient Safety and Quality Improvement
SBP3: Identifies forces that impact the cost of health care, and advocates for and practices cost-effective care	SBP2: System Navigation for Patient-Centered Care SBP3: Physician Role in Health Care Systems
SBP4: Transitions patients effectively within and across health delivery systems	SBP2: System Navigation for Patient-Centered Care

PBLI1: Monitors practice with a goal for improvement	PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI2: Learns and improves via performance audit	PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI3: Learns and improves via feedback	PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI4: Learns and improves at the point of care	PBLI1: Evidence-Based and Informed Practice
PROF1: Has professional and respectful interactions with patients, caregivers, and members of the interprofessional team	PROF1: Professional Behavior and Ethical Principles PROF3: Self-Awareness and Well-Being ICS1: Patient- and Family-Centered Communication ICS2: Interprofessional and Team Communication
PROF2: Accepts responsibility and follows through on tasks	PROF2: Accountability
PROF3: Responds to each patient's unique characteristics and needs	ICS1: Patient- and Family-Centered Communication
PROF4: Exhibits integrity and ethical behavior in professional conduct	PROF1: Professional Behavior and Ethical Principles
ICS1: Communicates effectively with patients and caregivers	ICS1: Patient- and Family-Centered Communication ICS4: Complex Communication Around Serious Illness
ICS2: Communicates effectively in interprofessional teams	ICS2: Interprofessional and Team Communication
ICS3: Appropriate utilization and completion of health records	ICS3: Communication within Health Care Systems

Available Milestones Resources

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

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

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

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

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

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

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

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

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

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

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

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

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