Thoracic Surgery Integrated Milestones

The Accreditation Council for Graduate Medical Education

ACGME

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Thoracic Surgery – Integrated Milestones

The Milestones are designed only for use in evaluation of residents in the context of their participation in ACGME-accredited residency programs. The Milestones provide a framework for the assessment of the development of the resident in key dimensions of the elements of physician competency in a specialty or subspecialty. They neither represent the entirety of the dimensions of the six domains of physician competency, nor are they designed to be relevant in any other context.

Thoracic Surgery – Integrated Milestones Work Group

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American Board of Thoracic Surgery
Review Committee for Thoracic Surgery
Thoracic Surgery Directors Association

Understanding Milestone Levels and Reporting

This document presents the Milestones, which programs use in a semi-annual review of resident performance, and then report to the ACGME. Milestones are knowledge, skills, attitudes, and other attributes for each of the ACGME Competencies organized in a developmental framework. The narrative descriptions are targets for resident performance throughout their educational program. Milestones are arranged into levels. Tracking from Level 1 to Level 5 is synonymous with moving from novice to expert resident in the specialty or subspecialty. For each reporting period, the Clinical Competency Committee will review the completed evaluations to select the milestone levels that best describe each learner's current performance, abilities, and attributes for each subcompetency.

These levels *do not* correspond with post-graduate year of education. Depending on previous experience, a junior resident may achieve higher levels early in his/her educational program just as a senior resident may be at a lower level later in his/her educational program. There is no predetermined timing for a resident to attain any particular level. Residents may also regress in achievement of their milestones. This may happen for many reasons, such as over scoring in a previous review, a disjointed experience in a particular procedure, or a significant act by the resident.

Selection of a level implies the resident substantially demonstrates the milestones in that level, as well as those in lower levels (see the diagram on page v).

Additional Notes

Level 4 is designed as a graduation *goal* but *does not* represent a graduation *requirement*. Making decisions about readiness for graduation and unsupervised practice is the purview of the program director. Furthermore, Milestones 2.0 include revisions and changes that preclude using Milestones as a sole assessment in high-stakes decisions (i.e., determination of eligibility for certification or credentialing). Level 5 is designed to represent an expert resident whose achievements in a subcompetency are greater than the expectation. Milestones are primarily designed for formative, developmental purposes to support continuous quality improvement for individual learners, education programs, and the specialty. The ACGME and its partners will continue to evaluate and perform research on the Milestones to assess their impact and value.

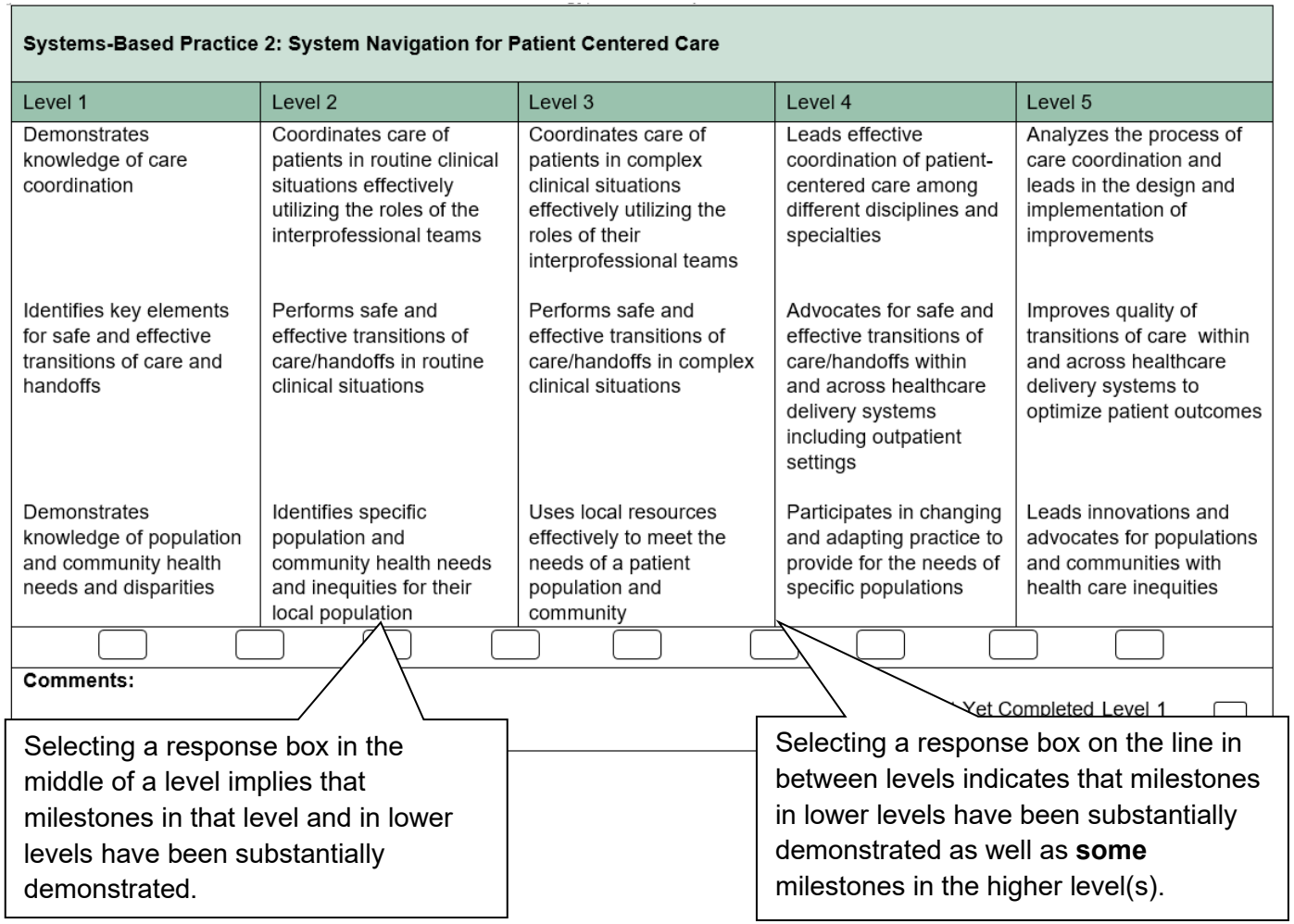
Examples are provided for some milestones within this document. Please note: the examples are not the required element or outcome; they are provided as a way to share the intent of the element.

Some milestone descriptions include statements about performing independently. These activities must occur in conformity to ACGME supervision guidelines as described in the Program Requirements, as well as to institutional and program policies. For example, a resident who performs a procedure independently must, at a minimum, be supervised through oversight.

A Supplemental Guide is also available to provide the intent of each subcompetency, examples for each level, assessment methods or tools, and other available resources. The Supplemental Guide, like examples contained within the Milestones, is designed only to assist the program director and Clinical Competency Committee, and is not meant to demonstrate any required element or outcome.

Additional resources are available in the Milestones section of the ACGME website. Follow the links under “What We Do” at www.acgme.org.

The diagram below presents an example set of milestones for one subcompetency in the same format as the ACGME Report Worksheet. For each reporting period, a resident's performance on the milestones for each subcompetency will be indicated by selecting the level of milestones that best describes that resident's performance in relation to those milestones.



Systems-Based Practice 2: System Navigation for Patient Centered Care				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of care coordination	Coordinates care of patients in routine clinical situations effectively utilizing the roles of the interprofessional teams	Coordinates care of patients in complex clinical situations effectively utilizing the roles of their interprofessional teams	Leads effective coordination of patient-centered care among different disciplines and specialties	Analyzes the process of care coordination and leads in the design and implementation of improvements
Identifies key elements for safe and effective transitions of care and handoffs	Performs safe and effective transitions of care/handoffs in routine clinical situations	Performs safe and effective transitions of care/handoffs in complex clinical situations	Advocates for safe and effective transitions of care/handoffs within and across healthcare delivery systems including outpatient settings	Improves quality of transitions of care within and across healthcare delivery systems to optimize patient outcomes
Demonstrates knowledge of population and community health needs and disparities	Identifies specific population and community health needs and inequities for their local population	Uses local resources effectively to meet the needs of a patient population and community	Participates in changing and adapting practice to provide for the needs of specific populations	Leads innovations and advocates for populations and communities with health care inequities
Comments:				Yet Completed Level 1

Patient Care 1: Ischemic Heart Disease				
Level 1	Level 2	Level 3	Level 4	Level 5
Performs a disease specific history and physical and develops a diagnostic plan for a patient with ischemic heart disease	Interprets diagnostic testing and develops a treatment plan, including outpatient follow-up, for a patient with routine ischemic heart disease	Develops a treatment plan, including outpatient follow-up, for a patient with complex ischemic heart disease	Develops a treatment plan, including outpatient follow-up, for a patient with multiple comorbidities and complex ischemic heart disease	
Assists in routine coronary procedures, including set-up and positioning	Performs components of coronary procedures	Performs basic coronary procedures and recognizes intra-operative complications	Performs complex coronary procedures and manages intra-operative complications	Performs advanced coronary procedures
Performs routine post-operative care and recognizes complications of coronary procedures	Manages simple post-operative complications of coronary procedures	Recognizes and creates a plan for complex complications of coronary	Manages complex complications of coronary procedures in critically ill patients	Manages advanced intra- and post-operative complications of coronary procedures in critically ill patients
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Patient Care 2: Mechanical Circulatory Support				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies a patient in need of mechanical circulatory support Assists in routine procedures, including set-up and positioning	Develops a diagnostic and treatment plan for a patient in need of mechanical circulatory support Assists in initiation of mechanical circulatory support	Develops a treatment plan for a patient in need of mechanical circulatory support with complex disease Performs components of mechanical circulatory support	Manages a patient on mechanical circulatory support and knows the principles of weaning a patient Initiates routine mechanical circulatory support, and manages routine complications	Manages a patient who is able to be discontinued from mechanical circulatory support or in need of long-term strategy for end-stage failure
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				
				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Patient Care 3: Valvular Disease				
Level 1	Level 2	Level 3	Level 4	Level 5
Performs a disease specific history and physical and develops a diagnostic plan for patients with valvular heart disease	Interprets diagnostic testing and develops a treatment plan for a patient with routine valvular heart disease	Develops a treatment plan, including outpatient follow-up, for a patient with complex valvular heart disease	Develops a treatment plan, including outpatient follow-up, for a patient with multiple comorbidities and advanced valvular heart disease	
Assists in routine procedures, including set-up and positioning, for patients with valvular heart disease	Performs components of routine procedures for patients undergoing surgery for valvular heart disease	Performs basic procedures on patients with valvular heart disease and recognizes intra-operative complications	Performs complex procedures and manages intra-operative complications in patients undergoing surgery for valvular heart disease	Performs advanced procedures for valvular heart disease
Performs routine post-operative care and recognizes complications related to heart valve surgery	Manages routine post-operative complications	Recognizes and creates a plan for complex complications	Manages complex complications	Manages advanced intra- and post-operative complications
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				
				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Patient Care 4: Great Vessel Disease				
Level 1	Level 2	Level 3	Level 4	Level 5
Performs a disease-specific history and physical and develops a diagnostic plan for patients with disease of the great vessels	Interprets diagnostic testing and develops a treatment plan, including outpatient follow-up, for a patient with routine great vessel disease	Develops a treatment plan, including outpatient follow-up, for a patient with complex disease of the great vessels	Develops a treatment plan, including outpatient follow-up, for a patient with multiple comorbidities and complex disease of the great vessels	
Assists in routine procedures, including set-up and positioning for patients with disease of the great vessels	Performs components of routine procedures on the great vessels	Plans and performs basic procedures and recognizes intra-operative complications	Plans and performs complex procedures and manages intra-operative complications	Performs advanced procedures
Performs routine post-operative care and recognizes complications in patients with disease of the great vessels	Manages simple post-operative complications in patients with disease of the great vessels	Recognizes and creates a plan for complex complications	Manages complex complications in critically ill patients	Manages advanced intra- and post-operative complications
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Patient Care 5: Esophagus				
Level 1	Level 2	Level 3	Level 4	Level 5
Performs a disease specific history and physical and develops a diagnostic plan	Develops a treatment plan, including outpatient follow-up, for patients with routine esophageal disease	Develops a treatment plan, including outpatient follow-up, for patients with complex esophageal disease	Develops a treatment plan, including outpatient follow-up, for a patient with multiple comorbidities and complex esophageal disease	Develops a treatment plan for a patient condition that does not have clear guidelines
Assists in routine procedures, including set-up and positioning	Performs components of procedures	Performs routine procedures and recognizes intra-operative complications	Performs complex procedures and manages intra-operative complications	Performs advanced procedures and manages intra-operative complications
Performs routine post-operative care and recognizes complications	Manages routine post-operative complications	Recognizes and creates a plan for complex complications	Manages complex complications in critically ill patients	Manages advanced complications without clear guidelines
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Comments:

Not Yet Completed Level 1 ☐

Not Yet Assessable ☐

Patient Care 6: Lung and Airway				
Level 1	Level 2	Level 3	Level 4	Level 5
Performs a disease specific history and physical and develops a diagnostic plan	Interprets diagnostic testing and develops a treatment plan, including outpatient follow-up, for a patient with routine disease	Develops a treatment plan, including outpatient follow-up, for a patient with routine disease and multiple comorbidities or anatomic complexity	Develops a treatment plan, including outpatient follow-up, for a patient with complex disease	Develops a treatment plan for a condition that does not have clear guidelines
Assists in routine procedures, including set-up and positioning	Performs bedside procedures and components of routine procedures	Performs routine procedures and recognizes intra-operative complications	Performs complex procedures and manages intra-operative complications	Performs advanced procedures and manages intra-operative complications
Performs routine post-operative care and recognizes complications	Manages routine post-operative complications	Recognizes and creates a plan for complex complications	Manages complex complications in critically ill patients	Manages advanced complications without clear guidelines
☐	☐	☐	☐	☐
Comments:				

Not Yet Completed Level 1 ☐

Not Yet Assessable ☐

Patient Care 7: Chest Wall/Pleura/Mediastinum/Diaphragm				
Level 1	Level 2	Level 3	Level 4	Level 5
Performs a disease-specific history and physical and develops a diagnostic plan	Interprets diagnostic testing and develops a treatment plan, including outpatient follow-up, for a patient with routine disease	Develops a treatment plan, including outpatient follow-up, for a patient with complex disease	Develops a treatment plan, including outpatient follow-up, for a patient with multiple comorbidities and complex disease	
Assists in routine procedures, including set-up and positioning	Performs bedside procedures and components of routine procedures	Performs routine procedures and recognizes intra-operative complications	Performs complex procedures and manages intra-operative complications	Performs advanced procedures
Performs routine post-operative care and recognizes complications	Manages routine post-operative complications	Recognizes and creates a plan for complex complications	Manages complex complications in critically ill patients	Manages advanced intra- and post-operative complications
☐	☐	☐	☐	☐
Comments:				
				Not Yet Completed Level 1 ☐
				Not Yet Assessable ☐

Patient Care 8: Critical Care				
Level 1	Level 2	Level 3	Level 4	Level 5
Interprets diagnostic data for a critically ill patient Performs routine critical care-related procedures	Implements a treatment plan for peri-operative patients with routine procedures Recognizes need for complex procedures	Implements a treatment plan for peri-operative patients with complex procedures Performs complex bedside procedures	Implements a treatment plan for a patient with multiple comorbidities and complex disease Performs complex bedside procedures during an emergency situation	Implements a treatment plan for a patient condition that does not have clear guidelines Performs advanced bedside procedures
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Comments:				
				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Patient Care 9: Technical Skills for General Surgery				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates limited tissue-handling skills	Inconsistently demonstrates careful tissue handling	Consistently demonstrates careful tissue handling	Adapts tissue handling based on tissue quality	Identifies innovative operative techniques, instrumentation, operative approaches, or significant improvement in established techniques
Requires prompting to identify appropriate tissue plane	Identifies appropriate plane but requires redirection to maintain dissection in the optimal tissue plane	Visualizes tissue plane, identifies and dissects relevant normal anatomy	Visualizes tissue plane, identifies and dissects relevant abnormal anatomy	
Moves forward in the operation only with active direction	Moves forward in the operation but requires prompting to complete the operation	Moves fluidly through the course of the operation and anticipates next steps	Adapts to unexpected findings and events during the course of the operation	
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Comments:				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Medical Knowledge 1: Cardiovascular Surgical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies normal cardiovascular anatomy	Identifies variants of cardiovascular anatomy	Integrates knowledge of anatomy with diagnostic testing	Integrates knowledge of anatomical changes after prior surgery with diagnostic testing	Uses advanced imaging techniques to help identify anatomic variability for operative planning
Identifies normal cardiovascular physiology	Identifies cardiovascular pathophysiology	Integrates knowledge of pathophysiology with diagnostic testing	Integrates knowledge of pathophysiologic changes after prior surgery with diagnostic testing	Contributes to medical literature
Lists components of cardiopulmonary bypass apparatus	Demonstrates knowledge of cardioplegia solutions, delivery modes, and complications of bypass	Discusses cannulation techniques and options for cardiopulmonary bypass	Explains management strategies of complex complications related to cardiopulmonary bypass	
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Comments:				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Medical Knowledge 2: General Thoracic Surgical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies normal general thoracic anatomy	Identifies variants of general thoracic anatomy	Integrates knowledge of anatomy with diagnostic testing	Integrates knowledge of anatomical changes after prior surgery with diagnostic testing	Uses advanced imaging techniques to help identify anatomic variability for operative planning
Identifies normal general thoracic physiology	Identifies general thoracic pathophysiology and staging of thoracic malignancies	Integrates knowledge of pathophysiology with diagnostic testing	Integrates knowledge of pathophysiologic changes after prior surgery with diagnostic testing	Contributes to medical literature
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Medical Knowledge 3: Congenital Heart Disease				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of embryology, anatomy, and physiology related to routine forms of congenital heart disease	Demonstrates knowledge of embryology, anatomy, and physiology related to complex forms of congenital heart disease	Demonstrates knowledge of operative principles and non-operative options for routine forms of congenital heart disease	Demonstrates knowledge of operative principles and non-operative options for complex forms of congenital heart disease	Demonstrates knowledge of operative principles and non-operative options for advanced forms of congenital heart disease
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Comments:				Not Yet Completed Level 1 ☐ Not Yet Assessable ☐

Systems-Based Practice 1: Patient Safety and Quality Improvement				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of common patient safety events	Identifies system factors that lead to patient safety events	Participates in analysis of patient safety events (simulated or actual)	Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)	Actively engages teams and processes to modify systems to prevent patient safety events
Demonstrates knowledge of how to report patient safety events	Reports patient safety events to superiors/ faculty members	Reports patient safety events through institutional reporting systems (actual or simulated)	Participates in disclosure of patient safety events to patients and families (simulated or actual)	Role models or mentors others in the reporting/disclosure of patient safety events to superiors/organization
Demonstrates knowledge of basic quality improvement methodologies and metrics	Describes local quality improvement initiatives	Participates in local quality improvement initiatives	Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project	Creates, implements, and assesses quality improvement initiatives at the institutional or community level
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Comments:				
				Not Yet Completed Level 1 ☐

Systems-Based Practice 2: System Navigation for Patient-Centered Care				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of care coordination	Coordinates care of patients in routine clinical/social situations effectively using the roles of the interprofessional teams	Coordinates care of patients in complex clinical/social situations effectively using the roles of the interprofessional teams	Role models effective coordination of patient-centered care among different disciplines and specialties	Analyzes the process of care coordination and leads in the design and implementation of improvements
Identifies key elements for safe and effective transitions of care and hand-offs	Performs safe and effective transitions of care/hand-offs in routine clinical situations	Performs safe and effective transitions of care/hand-offs in complex clinical situations	Role models and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems	Improves quality of transitions of care within and across health care delivery systems to optimize patient outcomes
Demonstrates knowledge of population and community health needs and disparities	Identifies specific population and community health needs and inequities for their local population	Uses local resources effectively to meet the needs of a patient population and community	Adapts personal practice to provide for the needs of specific populations	Leads innovations and advocates for populations and communities with health care inequities
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Comments:				
Not Yet Completed Level 1 ☐				

Systems-Based Practice 3: Physician Role in Health Care Systems				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies key components of the complex health care system	Describes how components of a complex health care system are interrelated, and how this impacts patient care	Discusses how individual practice affects the broader system	Manages and adapts personal practice to provide efficient and effective patient care and transition of care	Advocates for or leads systems change that enhances efficient and effective patient care and transition of care
Describes basic health payment systems, including practice models	Delivers care with consideration of each patient's payment model	Engages with patients in shared decision making, informed by each patient's payment models	Advocates for patient care needs with consideration of the limitations of each patient's payment model	Participates in health policy advocacy activities
Identifies basic knowledge domains for effective transition to practice	Demonstrates use of information technology required for medical practice	Describes core administrative knowledge needed for transition to practice	Analyzes practice patterns and professional requirements in preparation for practice	Educates others to prepare them for transition to practice
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Comments:				Not Yet Completed Level 1 ☐

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates how to access and use available evidence to take care of a routine patient	Articulates clinical questions and elicits patient preferences and values in order to guide evidence-based care	Locates and applies the best available evidence, integrated with patient preference, to the care of complex patients	Critically appraises and applies evidence even in the face of uncertainty and conflicting evidence to guide care, tailored to the individual patient	Coaches others to critically appraise and apply evidence for complex patients; and/or participates in the development of guidelines
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Comments:				
Not Yet Completed Level 1 ☐				

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth				
Level 1	Level 2	Level 3	Level 4	Level 5
Accepts responsibility for personal and professional development by establishing goals and actively seeking opportunities to improve	When prompted, uses performance data to identify gaps, design, and implement a learning plan	Independently uses performance data to identify gaps, design, and implement a learning plan	Independently uses performance data to measure the effectiveness of the learning plan and adapt the plan as needed	Facilitates the design and implementing learning plans for others
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				Not Yet Completed Level 1 ☐

Professionalism 1: Ethical Principles				
Level 1	Level 2	Level 3	Level 4	Level 5
Demonstrates knowledge of the ethical principles underlying informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics	Applies ethical principles during patient care	Recognizes need to seek help in managing and resolving ethical situations	Uses appropriate resources for managing and resolving ethical dilemmas as needed	Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution
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Comments:				
Not Yet Completed Level 1 ☐				

Professionalism 2: Professional Behavior and Accountability				
Level 1	Level 2	Level 3	Level 4	Level 5
Completes patient care tasks and responsibilities, identifies potential barriers, and describes strategies for ensuring timely task completion	Performs patient care tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations	Performs patient care tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations	Recognizes situations that may impact others' ability to complete patient-care tasks and responsibilities in a timely manner	Develops systems to enhance other's ability to efficiently complete patient-care tasks and responsibilities
Describes when and how to appropriately report lapses in professional behavior	Takes responsibility for his or her own professional behavior and reports lapses in self and others	Demonstrates professional behavior in complex or stressful situations	Intervenes to prevent and correct lapses in professional behavior in self and others	Coaches others when their behavior fails to meet professional expectations
Accepts feedback highlighting gaps	Episodically seeks feedback	Intentionally seeks and integrates multisource feedback into practice	Provides constructive feedback to others	
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				
				Not Yet Completed Level 1 ☐

Professionalism 3: Administrative Tasks				
Level 1	Level 2	Level 3	Level 4	Level 5
Takes responsibility for failure to complete administrative tasks and responsibilities	Performs administrative tasks and responsibilities in a timely manner with appropriate attention to detail in routine situations	Performs administrative tasks and responsibilities in a timely manner with appropriate attention to detail in complex or stressful situations	Recognizes situations that may impact others' ability to complete administrative tasks and responsibilities in a timely manner	Develops systems to enhance other's ability to efficiently complete administrative tasks and responsibilities
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Comments:				
Not Yet Completed Level 1 ☐				

Professionalism 4: Well-Being				
Level 1	Level 2	Level 3	Level 4	Level 5
With assistance, recognizes status of personal and professional well-being	Independently recognizes status of personal and professional well-being	Proposes a plan to optimize personal and professional well-being	Executes a plan to optimize personal and professional well-being	Coaches others when emotional responses or limitations in knowledge/skills do not meet professional expectations
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				
Not Yet Completed Level 1 ☐				

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication				
Level 1	Level 2	Level 3	Level 4	Level 5
Introduces themselves and explains their role to the patient and family	Delivers routine information to patients and families and confirms understanding	Delivers complex and difficult information to patients and families and confirms understanding	Facilitates interdisciplinary patient and family conferences	Coaches others in the facilitation of difficult conversations
Provides timely updates to patients and families	Actively listens to patients and families to elicit patient preferences and expectations	Uses shared decision making to make a personalized care plan	Effectively negotiates and manages conflict among patients, families, and the health care team	Coaches others in conflict resolution
Identifies common barriers to effective communication	Identifies complex barriers to effective communication	When prompted, reflects on personal biases while attempting to minimize communication barriers	Manages communication barriers and biases	
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Comments:				
Not Yet Completed Level 1 ☐				

Interpersonal and Communication Skills 2: Interprofessional and Team Communication				
Level 1	Level 2	Level 3	Level 4	Level 5
Respectfully requests a consultation	Clearly and concisely requests a consultation	Verifies own understanding of consultant recommendations	Coordinates recommendations from different members of the health care team to optimize patient care	Models flexible communication strategies that value input from all health care team members, resolving conflict when needed
Respectfully receives a consultation request	Clearly and concisely responds to a consultation request	Verifies understanding of recommendations when providing consultation	Navigates and resolves disagreements with interprofessional team	
Uses language that values all members of the health care team	Communicates information effectively with all health care team members	Uses active listening to adapt communication style to fit team needs	Mediates conflict within the team	
☐	☐	☐	☐	☐
Comments:				
				Not Yet Completed Level 1 ☐

Interpersonal and Communication Skills 3: Communication within Health Care Systems				
Level 1	Level 2	Level 3	Level 4	Level 5
Accurately and timely documents information in the patient record	Completes documentation thoroughly and communicates diagnostic and therapeutic reasoning in an organized fashion	Completes documentation accurately, concisely, and completely	Communicates in a clearly organized, concise, and timely manner, and includes anticipatory guidance	Models feedback to improve others' written communication
Safeguards patient personal health information	Documents required data in formats specified by institutional policy	Appropriately selects direct and indirect forms of communication	Uses written and verbal communication (e.g., patient notes, email) in a professional manner	Guides departmental or institutional communication around policies and procedures
Communicates through appropriate channels as required by institutional policy	Respectfully communicates concerns about the system	Uses appropriate channels to offer clear and constructive suggestions to improve the system	Initiates difficult conversations with appropriate stakeholders to improve the system	Facilitates dialogue regarding systems issues among larger community stakeholders (institution, health care system, field)
☐	☐	☐	☐	☐ ☐ ☐ ☐ ☐
Comments:				
				Not Yet Completed Level 1 ☐

PC1: Ischemic Heart Disease Examples of Routine, Complex, and Advanced

Procedures		
Routine	**Complex**	**Advanced**
Primary CABG, Normal EF, First Sternotomy	Primary CABG, Low EF, First Sternotomy Primary Valve-CABG Redosternotomy, Primary CABG	Redo CABG LV Aneurysm Repair Post-infarct VSD
Complications		
Routine	**Complex**	**Advanced**
Atrial fibrillation, postoperative hypotension, bleeding,	Graft occlusion, tamponade, protamine reaction	Iatrogenic type A dissection Inability to wean from cardio-pulmonary bypass

PC2: Mechanical Circulatory Support Examples of Routine, Complex, and Advanced

Procedures

Routine	Advanced
ECMO Intra-aortic balloon pump From the former complex category: Temporary MCS (Impella, Centrimag, Tandem)	Durable LVAD, BiVAD

Complications

Routine	Complex	Advanced
bleeding, coagulopathy, thrombus in pump or circuit, arrhythmias, suction events	peripheral ischemia, LV distension/pulmonary edema	Right ventricular failure, Acute pump thrombosis, Differential upper and lower extremity perfusion

PC3: Valvular Disease Examples of Routine, Complex, and Advanced

Diseases	
Routine	**Complex**
	surgical vs. transcatheter

Procedures		
Routine	**Complex**	**Advanced**
Aortic Valve Replacement Mitral Valve Replacement BASIC paravalvular leak, systolic anterior motion	Aortic Root Replacement (Bentall) Mitral Valve Repair Double Valve Replacement Arrhythmia Procedures	Aortic Valve Repair Aortic Root Replacement (any other than Bentall) Redo Valve Replacement Aortic root enlargement

Complications		
Routine	**Complex**	**Advanced**
heart block, atrial fibrillation, hypotension, bleeding, tamponade	SAM, small aortic root/PPM, occluded/kinked coronary button, paravalvular leak, left circumflex injury, calcified mitral annulus, A-V groove disruption	Management of aortic root abscess Management of complications of multi-valve surgery

PC4: Great Vessel Disease Examples of Routine, Complex, and Advanced		
Procedures		
Routine	**Complex**	**Advanced**
Ascending Aortic Replacement	Type A Aortic Dissection Repair Combined Valve-Ascending Aortic Surgery	TEVAR Thoraco-abdominal Aortic Aneurysm Surgery
Complications		
Routine	**Complex**	**Advanced**
Bleeding, hypothermia	Acute coronary ischemia Need for aortic arch replacement Acute cerebral ischemia	Acute spinal cord ischemia Acute end-organ ischemia following repair

PC 5: Esophagus Examples of Routine, Complex, and Advanced

Diseases

Routine	Complex
Initial Reflux	Achalasia/Mobility Disorders
Foreign body impaction	Perforation
Leiomyoma	Esophageal Cancer
Diverticula	Stricture
Barrets	Fistula
PEH	Trauma
Hiatal Hernia	Congenital disorders
	Post-endoscopic Complications
	Recurrent Reflux
	Recurrent Hernia
	Giant PEH

Procedures

Routine	Complex	Advanced
EGD	Stent	Redo plication
Dialation	Heller myotomy	Belsey fundoplication
Hiatal hernia repair	Collis	Esophagectomy with non-gastric conduit
First time fundo	Repair esophageal perforation	Complex esophagectomy (prior fundo)
	Esophageal diversion	Management corrosive injury
	Open esophagectomy	
	MIE (VATS or robotic)	
	POEM	

	Enucleation Diverticulectomy Giant PEH Penetrating injuries	
Complications		
Routine	**Complex**	**Advanced**
Stricture Afib Atelectasis Pneumonia Fever Arrhythmia Recurrent nerve injury Aspiration DVT/PE Ileus Bleeding UTI	Leak Dehiscence Chylothorax Fistula Conduit necrosis Death Empyema Airway injury Perforation Conduit dysmotility	

PC6: Lung and Airway Examples of Routine, Complex, and Advanced

Diseases

Routine	Complex
Solitary Lung Nodule	Locally Advanced Lung Cancer
Early Stage Lung Cancer	Severe Bullous Emphysema
Metastasis to Lung	End Stage COPD
Stable Hemoptysis	End Stage Lung Disease (Cystic Fibrosis, etc)
Tracheal Stenosis	Lung Abscess
Pulmonary Sequestration	Bronchopleural Fistula
Carcinoid	Massive Hemoptysis
	Tracheal Malignancy

Procedures

Bedside procedures/components	Routine	Complex	Advanced
Flexible Bronchoscopy	Lung biopsy	Segmentectomy	Sleeve/ bronchoplasty
Port Placement	Wedge resection	Pneumonectomy	Tracheal resection
Thoracotomy	Lobectomy	Extended pulmonary resections	Pancoast Tumor
Division of individual structures during lobectomy (vein, artery)	Tracheostomy	Minimally invasive lobectomy	Lung Volume Resection Surgery
		Interventional Bronchoscopy / EBUS	Rigid Bronchoscopy

(Post-operative) Complications

Routine (simple)	Complex	Advanced
Hemothorax	Bronchopleural fistula	
Effusion	Empyema	
Prolonged airleak	Respiratory failure	
Atrial fibrillation	Vascular injury	
Surgical site infection	Chylothorax	
Nerve injury	Tracheo-Innominate fistula	

PC7: Chest Wall/Pleura/Mediastinum Examples of Routine, Complex, and Advanced

Diseases

Routine	Complex
Chylothorax	Malignant Pleural Mesothelioma
Hyperhidrosis	Thoracic Outlet Syndromes
Hemothorax	Chest wall tumors
Pneumothorax/Pneumomediastinum	Pectus Excavatum
Malignant effusion	Mediastinal Tumors
Fibrothorax	Bronchopleural fistula
Chest Wall Infections	Diaphragm Rupture

Procedures

Bedside procedures/components	Basic	Complex	Advanced
Port placement	Mediastinoscopy/ Chamberlin	Decortication	Pancoast Tumor
Thoracotomy	Pleurodesis	Diaphragm repair/ resection	Extra Pleural Pneumonectomy with Pleurectomy Decortication
Tube thoracostomy	PleurX Catheter	Mediastinal mass/cyst resection	Pericardiectomy
Thoracentesis	Pleural Biopsy	Thoracic Outlet Syndrome	
Intercostal muscle harvest	Rib Plating	Pectus excavatum	
	Evacuation of Hemothorax	Chest wall/ Sternal reconstruction	
	Sympathectomy	Diaphragm plication	
	Mediastinal drainage	Congenital diaphragmatic hernia	
	Pericardial window	Congenital cystic adenomatoid malformation (CCAM)	

Complications		
Routine (simple)	**Complex**	**Advanced**
Effusion Hemothorax Pneumothorax Atrial fibrillation Nerve injury (Recurrent/Phrenic) Surgical site infection	Empyema Infected hardware/implant Vascular injury Diaphragmatic disruption Chylothorax	

PC 8: Critical Care Examples of Routine, Complex, and Advanced

Diseases	
Routine	**Complex**
Distributive shock	Any shock with complications
Cardiogenic shock	Heart failure treated with > 1 inotrope
Obstructive shock	Heart failure treated with a temporary or permanent device
Hypovolemic shock	RV failure treated with a temporary device (percutaneous or central RVAD)
Workup for cardiac transplantation	RV failure treated with inhaled pulmonary vasodilators (NO, veletri, etc)
Workup for pulmonary transplantation	Hemodynamic instability treated with > 1 vasoactive infusion
Postop care for pulmonary transplantation without complications	Hypertensive emergency with complications (dissection, PAU) with the need for vasoactive infusions
Postop care for cardiac transplantation without complications	Postop care for PTE
Postop care for routine cardiac operations (CABG, isolated valve, valve + CABG, uncomplicated aortic replacement)	Postop care for complicated aortic surgery
Routine postop care for cardiopulmonary operations complicated by 1 or less additional organ dysfunction (GI bleed, renal failure, liver failure, respiratory failure, etc)	Postop care for cardiac transplantation with complications (hemorrhage, tamponade, persistent lactate, open chest, mechanical support, etc)
Management of nutritional deficiencies	Postop care for pulmonary transplantation (hemorrhage, tamponade, persistent lactate, open chest, mechanical support, etc)
Management of kidney injury (initial workup, treatment, fluid and diuretic management, recognizing the need for renal replacement)	Care of a patient with a disease complicated by multi-organ system dysfunction (renal failure, liver failure, respiratory failure, etc)
Management of respiratory failure and adjuncts for treatment	

Procedures		
Routine	**Complex**	**Advanced**
Central line (internal jugular, subclavian, femoral) Arterial line (radial) Intubation Temporary dialysis catheter placement Transcutaneous pacing and defibrillation Cardioversion Management of epicardial pacemaker Management of nutritional deficiencies with enteral or parenteral nutrition	Arterial line (femoral, brachial) TTE TEE IABP placement Flexible bronchoscopy with or without BAL, lavage, brushings, etc Transvenous pacemaker placement Intubation CPAP/BiPAP/ Invasive ventilator management	Arterial line (cut down approach) Bedside surgical procedures (ex-lap, thoracotomy, reopening of sternotomy) IABP placement Placement of temporary mechanical support (ECMO, Impella, percutaneous RVAD) Tracheostomy Percutaneous gastrostomy tube placement (PEG) EGD Rigid bronchoscopy Flexible bronchoscopy with biopsy
Complications		
Routine	**Complex**	**Advanced**
Single organ complication (hemorrhage, isolated organ failure, etc.)	Multiorgan system failure	