Supplemental Guide:
Pediatric Pathology

A C G M E

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TABLE OF CONTENTS

Milestones Supplemental Guide

This document provides additional guidance and examples for the Pediatric Pathology 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: Pediatric and Perinatal Pathology Grossing (Examine, Describe, Triage, Sample, and Document)	
Overall Intent: To perform gross examination of routine and complex pediatric and perinatal specimens for optimal patient care	
Milestones	**Examples**
Level 1 *Performs gross examination of routine specimens, with direct supervision*	● Receives oriented skin ellipse from operating room, correctly inks and preserves orientation; submits cassettes based on standard grossing protocols
Level 2 *Performs gross examination of complex specimens, with direct supervision*	● Receives tumor specimen, triages for cytogenetic studies, submits pilot section, and submits cassettes based on standard grossing protocols
Level 3 *Performs gross examination of complex specimens and identifies when additional sampling is necessary for diagnosis or staging, with indirect supervision*	● Receives Wilms tumor, photographs, inks, maps, and samples specimen, according to consensus protocols; discusses intra-operative findings with surgeon with attending guidance
Level 4 *Independently performs gross examination of complex specimens*	● Receives osteosarcoma resection, photographs, inks, submits margins, cuts longitudinal section, decalcifies, and maps specimen; discusses gross margins and orientation with surgeon, independently
Level 5 *Serves as an expert resource for gross examination and applies innovative approaches of grossing to demonstrate innovative pathology in unique specimens*	● Serves as a resource for faculty members and co-fellows for dissecting explanted complex congenital heart disease specimens
Assessment Models or Tools	● Case based discussions ● Clinical-Pathologic conferences ● Direct observation ● Presentations ● Review of gross descriptions and photographs
Curriculum Mapping	●
Notes or Resources	● Kaplan CG. *Color Atlas of Gross Placental Pathology*. 2nd ed. New York, NY: Springer Science+Business Media; 2006. ● Lester SC. *Manual of Surgical Pathology*. 2nd ed. Philadelphia, PA: Elsevier Saunders; 2005.

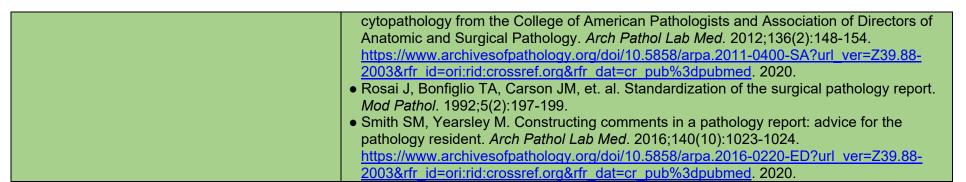| Patient Care 2: Intra-Operative Consultation (Frozen Sections, Rapid Onsite Evaluation of Fine Needle Aspiration) Overall Intent: To select, perform, and interpret common and complex pediatric intra-operative consultations	
Milestones	**Examples**
Level 1 *Selects tissue and prepares quality slides for common and complex pediatric cases, with direct supervision*	● Receives lymph node for intra-operative consultation (IOC); selects appropriate tissue, performs touch prep/freezes, cuts, stains, and prepares readable slides, with direct supervision
Develops differential diagnosis of common pediatric specimens and recognizes broad diagnostic categories (i.e., benign versus malignant, normal versus abnormal)	● Lists a differential diagnosis of reactive versus malignant disorders of lymph nodes
Level 2 *Selects tissue and prepares quality slides for common pediatric cases, with indirect supervision, and complex pediatric cases, with direct supervision*	● Selects appropriate lymph node tissue, performs touch prep/freezes, cuts, stains, and prepares readable slides, with indirect supervision ● Orients and cuts seromuscular biopsy for Hirschsprung disease with direct supervision
Interprets common pediatric cases independently and develops differential for complex pediatric cases with guidance	● Differentiates inflammatory/reactive bone lesions from malignant neoplastic disorders independently ● Lists a differential diagnosis of spindle cell soft tissue tumors with guidance
Level 3 *Selects tissue and prepares quality slides for common pediatric cases, independently, and complex pediatric cases, with indirect supervision*	● Selects appropriate lymph node tissue, performs touch prep/freezes, cuts, stains and prepares readable slides, independently ● Orients and cuts margins of partial nephrectomy/wedge resections for bilateral treated Wilms tumor with nephrogenic rests with indirect supervision
Interprets common pediatric cases independently and complex cases with guidance	● Interprets margins for partial nephrectomy/wedge resections for bilateral treated Wilms tumor with nephrogenic rests with guidance ● Lists a differential diagnosis of spindle cell soft tissue tumors independently
Level 4 *Independently selects tissue and prepares quality slides for common and complex pediatric cases*	● Independently orients and cuts margins of partial nephrectomy/wedge resections for bilateral treated Wilms tumor with nephrogenic rests
Independently interprets common and complex pediatric cases	● Interprets margins for bilateral Wilms tumor resections, independently
Level 5 *Serves as an expert resource for intraoperative consultations*	● Serves as a consultant for faculty members and co-fellows for technical and diagnostic performance of intra-operative consultation
Assessment Models or Tools	● Case based discussions

	● Direct observation ● Frozen/permanent correlation ● Presentations ● Slide review
Curriculum Mapping	●
Notes or Resources	● Marchevsky AM, Balzer B, Abdul-Karim FW. *Intraoperative Consultation: A Volume in the Series: Foundations in Diagnostic Pathology.* 1st ed. Philadelphia, PA: Elsevier Saunders; 2014. ● Taxy JB, Husain AN, Montag AG. *Biopsy Interpretation: The Frozen Section (Biopsy Interpretation Series)*. 1st ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2009.

Patient Care 3: Autopsy	
Overall Intent: To perform the technical aspects of an autopsy	

Milestones	Examples
Level 1 *Performs standard autopsy, with direct supervision* *Obtains clinical history from electronic health record (EHR) and/or other sources*	● Performs autopsy and placental exam in intact non-dysmorphic fetus with direct supervision; submits cassettes based on standard sampling protocols
Level 2 *Performs standard autopsy with indirect supervision and performs complex autopsy with direct supervision* *Reviews clinical history and summarizes pertinent findings*	● With direct supervision, performs autopsy on older child with neoplastic disease, and in addition to standard sampling, triages and samples tissue based on autopsy findings ● Performs standard fetopsy and placental exam with indirect supervision
Level 3 *Independently performs standard autopsy and performs complex autopsy with indirect supervision* *Reviews clinical history, summarizes pertinent findings, and identifies relevant clinical questions for standard cases*	● With indirect supervision, performs internal and external examination on an infant with multiple congenital anomalies; samples based on autopsy findings and triages tissue for molecular, genetic, and research testing
Level 4 *Independently performs standard and complex autopsy* *Reviews clinical history, summarizes pertinent findings, and identifies relevant clinical questions for complex cases*	● Independently dissects and classifies complex post-operative anatomy in repaired congenital anomalies
Level 5 *Serves as an expert resource for complex techniques in autopsy* *Serves as an expert resource for identifying and interpreting clinical questions in complex cases*	● Serves as an expert resource for faculty members and co-fellows for dissection in complex, rare, and unique autopsy cases
Assessment Models or Tools	● Autopsy log ● Case based discussions ● Clinical pathologic conferences ● Direct observation

	● Presentations ● Review of reports and photographs
Curriculum Mapping	●
Notes or Resources	● Bharati S, Lev M. *The Pathology of Congenital Heart Disease: A Personal Experience with More Than 6,300 Congenitally Malformed Hearts.* Armonk, NY: Futura Publishing Company; 1996. ● Gilbert-Barness E, Debich-Spicer DE, Steffensen TS. *Handbook of Pediatric Autopsy Pathology.* New York, NY: Springer; 2013. ● Local/institutional autopsy dissection procedure manual

Patient Care 4: Reporting, including Surgical Pathology, Cytopathology, and Autopsy	
Overall Intent: To draft clear and concise reports that include all the relevant information	

Milestones	Examples
Level 1 *Composes reports on routine cases, with guidance, including synoptics and amended/addended reports, when applicable*	● Composes a report for a singleton placenta with acute chorioamnionitis, using Amsterdam guidelines, with guidance ● Creates an addended report when additional cytogenetic studies become available, with guidance
Level 2 *Independently composes reports on routine cases*	● Independently writes a report for a thyroglossal duct cyst ● Independently writes a report for a singleton placenta with acute chorioamnionitis, using Amsterdam guidelines
Level 3 *Composes reports on complex cases with integration of clinical and ancillary (e.g., molecular, cytogenetic, flow cytometric) information, including language of uncertainty, with guidance*	● Develops a surgical pathology report for a neuroblastic tumor resection, including College of American Pathologists (CAP) synoptic templates and International Neuroblastoma Pathology Classification, with guidance ● Writes a report that interprets pathologic findings in light of discordant imaging, with assistance
Level 4 *Independently composes reports on complex cases with integration of clinical and ancillary information, including language of uncertainty*	● Independently develops a surgical pathology report for a neuroblastic tumor resection, including CAP synoptic templates and International Neuroblastoma Pathology Classification ● Independently reports an undifferentiated round cell sarcoma with negative molecular data, reflecting ambiguous final classification
Level 5 *Serves as a resource for composition of reports on complex cases with integration of clinical and ancillary information, including language of uncertainty*	● Drafts a report reconciling multiple discordant results and/or opinions, including those received from outside expert consultants
Assessment Models or Tools	● Attending evaluation during daily sign-out ● Chart review or other system documentation ● Consensus conference presentations ● Review of reports
Curriculum Mapping	●
Notes or Resources	● CAP. Cancer Protocol Templates. www.cap.org/cancerprotocols. 2020. ● Khong YT, Mooney EE, Ariel I, et al. Sampling and definitions of placental lesions: Amsterdam placental working group consensus statement. *Arch Pathol Lab Med*. 2016;140(7):698-713. https://www.archivesofpathology.org/doi/10.5858/arpa.2015-0225-CC?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. 2020. ● Nakhleh RE, Myers JL, Allen TC, et al. Consensus statement on effective communication of urgent diagnoses and significant, unexpected diagnoses in surgical pathology and

cytopathology from the College of American Pathologists and Association of Directors of Anatomic and Surgical Pathology. *Arch Pathol Lab Med.* 2012;136(2):148-154. https://www.archivesofpathology.org/doi/10.5858/arpa.2011-0400-SA?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. 2020.

- Rosai J, Bonfiglio TA, Carson JM, et. al. Standardization of the surgical pathology report. *Mod Pathol*. 1992;5(2):197-199.
- Smith SM, Yearsley M. Constructing comments in a pathology report: advice for the pathology resident. *Arch Pathol Lab Med*. 2016;140(10):1023-1024. https://www.archivesofpathology.org/doi/10.5858/arpa.2016-0220-ED?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. 2020.

Medical Knowledge 1: Knowledge of Pediatric and Perinatal Diseases	
Overall Intent: To demonstrate knowledge of perinatal and pediatric diseases and its application to common and complex clinical cases	
Milestones	**Examples**
Level 1 *Demonstrates basic medical knowledge acquired through pathology education in residency*	● Understands how Hirschsprung disease is defined and the role of the pathologist in its diagnosis
Demonstrates basic knowledge of histochemistry, immunohistochemistry, and molecular techniques	● Understands how histochemical and immunohistochemical stains aid in the diagnosis of Hirschsprung disease
Level 2 *Demonstrates advanced knowledge of common pediatric neoplastic and non-neoplastic diseases*	● Describes the setting and types of diagnostic procedures used to evaluate Hirschsprung disease
Demonstrates advanced knowledge of histochemistry, immunohistochemistry, and molecular techniques	● Orders calretinin and/or acetylcholinesterase
Level 3 *Applies advanced knowledge of uncommon pediatric neoplastic and non-neoplastic diseases*	● Identifies the pathologic features of uncommon Hirschsprung disease variants
Applies advanced knowledge of histochemistry, immunohistochemistry, and molecular techniques	● Interprets calretinin and/or acetylcholinesterase to diagnose Hirschsprung disease
Level 4 *Integrates advanced knowledge of uncommon pediatric neoplastic and non-neoplastic diseases, with reference to literature*	● Reviews prior pathology and clinical data in the context of current literature to advise surgeon on the possibility of a previous incomplete pull-through for Hirschsprung disease
Integrates advanced knowledge of histochemistry, immunohistochemistry, and molecular techniques with reference to literature	● Interprets calretinin and/or acetylcholinesterase to craft nuanced diagnosis of Hirschsprung disease variants in the context of current literature
Level 5 *Demonstrates expertise and teaches pediatric pathology*	● Teaches residents best practice guidelines for sampling and reporting in Hirschsprung disease

Demonstrates expertise and teaches histochemistry, immunohistochemistry, and molecular techniques	● Contributes to the literature in immunohistochemistry and other modalities in the diagnosis of Hirschsprung disease
Assessment Models or Tools	● Case-based discussions ● Clinical pathologic conferences ● Direct observation ● Presentations ● Review of drafted reports ● Unknown slide conferences
Curriculum Mapping	●
Notes or Resources	● Gilbert-Barness E, Kapur RP, Oligny LL, Siebert JR, Optiz JM. *Potter's Pathology of the Fetus, Infant and Child*. 2nd ed. Philadelphia, PA: Mosby Elsevier; 2007. ● Khong TY, Mooney EE, Nikkels PGJ, Morgan TK, Gordijn SJ, editors. *Pathology of Placenta: A Practical Guide*. Switzerland: Springer; 2019. ● Stocker JT, Dehner LP, Husain AN. *Stocker and Dehner's Pediatric Pathology*. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2011.

Medical Knowledge 2: Clinical Reasoning	
Overall Intent: To approach a diagnostic work-up in an informed and logical manner using appropriate resources to guide decisions	
Milestones	**Examples**
Level 1 *Demonstrates a basic framework for clinical reasoning*	● Reviews a radiology report and hospital discharge note for an autopsy to begin developing a differential diagnosis
Identifies appropriate resources to inform clinical reasoning	● Navigates electronic health record (EHR), laboratory information system (LIS), internet, and literature to locate necessary information
Level 2 *Demonstrates clinical reasoning to determine relevant information*	● Traces the evolution of a suspected fatal diagnosis throughout an intensive care unit (ICU) course, ignoring extraneous information to identify guiding questions prior to beginning an autopsy
Selects relevant resources based on scenario to inform decisions	● Is aware of and uses appropriate algorithms, consensus guidelines, and published literature
Level 3 *Synthesizes information to inform clinical reasoning, with assistance*	● Integrates imaging modality reports, death note, and internal and external exam findings at autopsy to craft a narrative of cause of death in an oncology autopsy case
Seeks and integrates evidence-based information to inform diagnostic decision making in complex cases, with assistance	● Uses published literature and recommendations to correctly classify a neuroblastic tumor
Level 4 *Independently synthesizes information to inform clinical reasoning in complex cases*	● Gathers and interprets cath, echo, and cardiac surgical operative notes to guide precise dissection of complex congenital heart disease autopsy case
Independently seeks out, analyzes, and applies relevant original research to diagnostic decision making in complex clinical cases	● Uses PubMed to identify novel molecular alterations to assist in the diagnosis of an undifferentiated soft tissue sarcoma
Level 5 *Demonstrates intuitive approach to clinical reasoning for complex cases*	● Serves as a resource for faculty members and co-fellows for narrative building and integration of clinical, gross, and microscopic findings for unique/complex cases
Assessment Models or Tools	● Case-based discussions ● Clinical pathologic conferences ● Direct observation ● Presentations ● Review of drafted reports ● Unknown slide conferences
Curriculum Mapping	●

| Notes or Resources | ● Archie JG, Collins JS, Lebel RR. Quantitative standards for fetal and neonatal autopsy. *Am J Clin Pathol*. 2006;126(2):256-265. https://watermark.silverchair.com/ajcpath126-0256.pdf?token=AQECAHi208BE49Ooan9kkhW_Ercy7Dm3ZL_9Cf3qfKAc485ysgAAAmkwggJIBgkqhkiG9w0BBwaqggJWMIICUgIBADCCAksGCSqGSIb3DQEHATAeBglghkgBZQMEAS4wEQQMW8jz7BzYHdxX-bGcAgEQgIICHF3bl2WIgGFx92k-anqdhUVWVMxyZu7ibCmNgLiIcv4VkBhGbR-DRW3mJIG1LcHG3EWN5Odw6UrwDMBbd85JTWIrXFxTxa60LmvV8kW_khW5x592CYmcu1bY-5sx42jNaVgP0og4YOKKYgnJG1iISHTBX_9fii7EkU9N0oOPOJaYFggVSioPck0p9vv_Y6wd3XVz-l5oV8X34AEl5VUH9w8NBRRIvRiv_ciH7cCVu1Z7YgMHOgmoRnlRpmkJ9rr5IHx3QfzNidy5u6bSsArweqS-Nep44u3geFtB8ZHenBzVH6P6LZbW5t5gVDCuoE2uIsCLfny-Li7JJuyTXZlClQ82VlWhNu9NMRobsKpMyUD4K_ftYAo7ww-Xav8HH1HRTDGNTeTzJKK55ygJuncTJhLuxlL92fzEXjv27ysocGkcN2YqczniHvIpIMJw7NaeTMS9jDarW3KBE-MGgZi2Lct6kjPYxwKmpBtLHuhTAYCjB2kiXG-xlGTImEiWCjbct7Kqzk940-wF4bcivVVO_t6KLUPxyqVS2DDPuGJpyU3P-ms-Zh3SFJS3NS99zJuSQuB_il_XvD2MFi_6b_DLaBn3Ao9uu5BbGLnV5hoprjPrT-QBfRdWsQLEGFgmzZhNNxgd96tZMqx6x9NLP28tIn5esd504gmFjPL9Y9bYsDYyCBQe3pxeG9UKlyMgRxOaXtRhhCZVoMTVgUkO6g. 2020.
● Clinical reasoning relies on appropriate foundational knowledge that requires the trainee to apply that knowledge in a thoughtful, deliberate and logical fashion to clinical cases to inform clinical care
● CAP. Biomarker Reporting Templates. https://www.cap.org/search?q=Biomarker%20reporting. 2020.
● CAP. Cancer Protocol Templates. https://www.cap.org/protocols-and-guidelines/cancer-reporting-tools/cancer-protocol-templates. 2020.
● Gilbert-Barness E, Debich-Spicer DE. *Handbook of Pediatric Autopsy Pathology*. Totowa, NJ: Springer Science & Business Media; 2008.
● Institutional EMR training (i.e. note filtering, graphing of longitudinal laboratory data, chart search functionality)
● Iobst WF, Trowbride R, Philibert I. Teaching and assessing critical reasoning through the use of entrustment. *J Grad Med Educ*. 2013;5(3):517-518. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3771188/. 2020.
● Medical literature databases: PubMed, Google Scholar |

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* *Demonstrates knowledge of how to report patient safety events* *Demonstrates knowledge of basic QI methodologies and metrics*	● Has basic knowledge of patient safety events, reporting pathways, and QI strategies, but has not yet participated in such activities
Level 2 *Identifies system factors that lead to patient safety events* *Reports patient safety events through institutional reporting systems (simulated or actual)* *Describes departmental and institutional QI initiatives*	● Identifies and reports a patient safety issue (real or simulated), along with system factors contributing to that issue ● Is aware of improvement initiatives within their scope of practice ● Attend departmental QI and patient safety activities such as huddles, QI reviews
Level 3 *Participates in analysis of patient safety events (simulated or actual)* *Participates in disclosure of patient safety events to clinicians and/or patients and families (simulated or actual)* *Participates in departmental and institutional QI initiatives*	● Reviews a patient safety event (e.g., preparing for morbidity and mortality (M and M) presentations, joining a root cause analysis group) and has participated in communication with clinicians about such an event ● Participates in a simulated exercise to report a safety event to a family ● Participates in a QI project, though they may not have yet designed a QI project
Level 4 *Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)* *Discloses patient safety events to clinicians and/or patients and families (simulated or actual)*	● Collaborates with a team to lead the analysis of a patient safety event and can competently communicate with the clinician and/or family about those events

Demonstrates the skills required to identify, develop, implement, and analyze a QI project	● Initiates and completes a QI project, including communication with stakeholders
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 QI initiatives at the institutional or community level*	● Competently assumes a leadership role at the departmental or institutional level for patient safety and/or QI initiatives, possibly even being the person to initiate action or call attention to the need for action
Assessment Models or Tools	● Direct observation ● E-module multiple choice tests ● Medical record (chart) audit ● Multisource feedback ● Portfolio ● Reflection ● Simulation
Curriculum Mapping	●
Notes or Resources	● ABPath approved Patient Safety Courses: American Society for Clinical Pathology (ASCP), College of American Pathologists (CAP), National Association of Medical Examiners (NAME), Society for Pediatric Pathology, United States and Canadian Academy of Pathology (USCAP) ● Institute of Healthcare Improvement. http://www.ihi.org/Pages/default.aspx. 2020.

Systems-Based Practice 2: Systems 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 case coordination*	● Identifies the members of the interprofessional team, including histotechnologists, laboratory technicians, pathologist assistants, consultants, other specialty physicians, nurses, and consultants, and describes their roles but is not yet routinely using team members or accessing all available resources
Identifies key elements for safe and effective transitions of care and hand-offs	● Lists the essential components of an effective sign-out and care transition including sharing information necessary for successful on-call/off-call transitions such as surgical cases in operating room requiring frozen sections, end of service delayed cases, pending intradepartmental or external consultations
Demonstrates knowledge of population and community health needs and disparities	● Identifies components of social determinants of health and how they impact the delivery of patient care
Level 2 *Coordinates care of patients/specimens in routine cases effectively using interprofessional teams*	● Contacts interprofessional team members for routine cases, but requires supervision to ensure all necessary referrals, testing, and care transitions
Performs safe and effective transitions of care/hand-offs in routine situations	● Performs a routine case sign-out but still needs direct supervision to identify and appropriately triage cases or calls (priority versus non-priority case or call) and anticipatory guidance
Identifies pathology's role in population and community health needs and inequities for the local population	● Identifies different populations within own cases and/or the local community ● Knows which patients are at high risk for specific health outcomes related to health literacy concerns, cost of testing or therapy, etc.
Level 3 *Coordinates care of patients/specimens in complex cases effectively using interprofessional teams*	● At interdisciplinary tumor boards (e.g., solid organ or hematopoietic malignancies), engages in appropriate discussion of patient care testing options and impact on therapy for complex pathologic cases
Performs safe and effective transitions of care/hand-offs in complex situations	● Appreciates the need for and uses local resources when coordinating pathology case transfer from an outside institution; coordinates specimen handling, ordering of needed tests/stains, and courier schedules
Identifies opportunities for pathology to participate in community and population health	● Aware of community service and public health opportunities requiring pathology expertise ● Recognizes the need to report a reportable disease to appropriate health authorities

Level 4 *Models effective coordination of patient-centered care among different disciplines and specialties* *Models and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems* *Recommends and/or participates in changing and adapting practice to provide for the needs of communities and populations*	● Role models and educates students and junior team members regarding the engagement of appropriate interprofessional team members, as needed for each patient and/or case, and ensures the necessary resources have been arranged ● Role models, initiates, and coordinates effective transition of care such as cases pending for sign-out, intra-operative frozen sections or consultations ● Proactively calls the clinical team to provide preliminary findings for rush cases and unexpected findings to ensure the patient gets appropriate follow-up ● Performs quality reviews and correlations between current findings and previous cytology/fine needle aspiration or previous biopsies to assure appropriate follow-up ● Is aware of and actively considers increased risk of an infection that is endemic to the country of origin of a local immigrant population
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 and communities with health care inequities*	● Works with hospital or ambulatory site team members or leadership to analyze care coordination and laboratory services in that setting, and takes a leadership role in designing and implementing changes to improve the care coordination and laboratory workflow/menu process and design ● Works with a QI mentor to identify better hand-off tools for on-call pathology services or to improve teaching sessions ● Designs a social determinants of health curriculum to help others learn to identify local resources and barriers to care and laboratory testing; effectively uses resources, such as telehealth and telepathology for proactive outreach programs in referring laboratories and institutions
Assessment Models or Tools	● Case management quality metrics ● Chart review ● Direct observation ● Multisource feedback ● Pathology report review
Curriculum Mapping	●

Notes or Resources	● Aller RD. Pathology's contributions to disease surveillance: sending our data to public health officials and encouraging our clinical colleagues to do so. *Archives of Path Lab Med*. 2009;133(6):926-932. https://www.archivesofpathology.org/doi/10.1043/1543-2165-133.6.926?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. 2020.
	● Centers for Disease Control and Prevention (CDC). Population Health Training in Place Program (PH-TIPP). https://www.cdc.gov/pophealthtraining/whatis.html. 2020.
	● CAP Competency Model for Pathologists. https://learn.cap.org/content/cap/pdfs/Competency_Model.pdf. 2020.
	● Kaplan KJ. In Pursuit of Patient-Centered Care. http://tissuepathology.com/2016/03/29/in-pursuit-of-patient-centered-care/#axzz5e7nSsAns. 2020.

Systems-Based Practice 3: Physician Role in Health Care System	
Overall Intent: To understand the physician role in the complex health care system and how to optimize the system to improve patient care and the health system's performance	
Milestones	**Examples**
Level 1 *Identifies key components of the complex health care system (e.g., hospital, reference lab, finance, personnel, technology)*	● Recognizes the multiple, often competing forces, in the health care system (e.g., names systems and providers involved test ordering and payment)
Describes basic health payment systems (e.g., government, private, public, uninsured care) and practice models	● Recognizes there are different payment systems, such as Medicare, Medicaid, the Veterans Affairs (VA), and commercial third-party payers, ● With direct supervision, completes a report following a routine patient specimen and applies appropriate coding in compliance with regulations
Level 2 *Describes how components of a complex health care system are interrelated, and how this impacts patient care*	● Understands the impact of health plans on testing workflow and reimbursement; demonstrates knowledge that is theoretical, but is not yet able to apply this knowledge to the care of patients without some direct attending input and/or prompting
Documents testing detail and explains the impact of documentation on billing and reimbursement	● Completes a report following a routine patient specimen and applies appropriate coding in compliance with regulations, with oversight
Level 3 *Discusses how individual practice affects the broader system (e.g., test utilization, turnaround time)*	● Understands, accesses, and analyzes own individual performance data; relevant data may include: o Autopsy Case Log o Consultation logs (e.g., on-call cases) o Grossing log
Engages with clinicians and/or patients in shared decision making, such as use of preauthorization for complex testing	● Uses shared decision making and adapts the choice of the most cost-effective testing depending on the relevant clinical needs
Level 4 *Manages various components of the complex health care system to provide efficient and effective patient care and transition of care*	● Works collaboratively with the institution to improve patient resources or design the institution's testing needs assessment, or develop/implement/assess the resulting action plans
Practices and advocates for cost effective patient care with consideration of the limitations of each patient's payment model	● Works with the obstetrics team to determine the most appropriate labs to be ordered for mothers with stillbirth

Level 5 *Advocates for or leads systems change that enhances high-value, efficient, and effective patient care and transition of care*	● Performs a LEAN analysis of laboratory practices to identify and modify areas of improvement to make laboratory testing more efficient
Participates in health policy advocacy activities	● Participates in state and national lobbying for Centers for Medicare & Medicaid Services (CMS) payment reform, public health initiatives, or expanding access to care
Assessment Models or Tools	● Audit of testing usage ● Direct observation ● QI project ● Review of billing code assignment to pathology cases (real or simulated)
Curriculum Mapping	●
Notes or Resources	● Agency for Healthcare Research and Quality. Major Physician Measurement Sets. https://www.ahrq.gov/talkingquality/measures/setting/physician/measurement-sets.html. 2020. ● Children's Hospital Association. Resource Library. https://www.childrenshospitals.org/Resources. 2020. ● The Commonwealth Fund. Health System Data Center. http://datacenter.commonwealthfund.org/?_ga=2.110888517.1505146611.1495417431-1811932185.1495417431#ind=1/sc=1. 2020. ● Dzau VJ, McClellan M, Burke S, et al. Vital directions for health and health care: priorities from a National Academy of Medicine Initiative. *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. https://nam.edu/vital-directions-for-health-health-care-priorities-from-a-national-academy-of-medicine-initiative/. 2020. ● Gross DJ, Kennedy M, Kothari T, et al. The Role of the Pathologist in Population Health. *Arch Pathol Lab Med*. 2019;143(5):610-620. https://www.archivesofpathology.org/doi/10.5858/arpa.2018-0223-CP?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. 2020. ● The Kaiser Family Foundation. www.kff.org. 2020.

Systems-Based Practice 4: Accreditation, Compliance, and Quality Overall Intent: To gain in-depth knowledge of the components of laboratory accreditation, regulatory compliance, and quality management	
Milestones	**Examples**
Level 1 *Demonstrates knowledge that laboratories must be accredited*	● Attends departmental quality assurance/quality control meetings, M and M conferences and accreditation/regulatory summation meetings ● Understands that there are different accrediting bodies for laboratories (CAP, Joint Commission on Accreditation of Healthcare Organizations (Joint Commission), etc.) with overlapping and differing requirements
Discusses the need for quality control and proficiency testing	● Understands that daily histology and immunohistochemistry quality control sheets are mandated for each case
Level 2 *Demonstrates knowledge of the components of laboratory accreditation and regulatory compliance (e.g., Clinical Laboratory Improvement Amendments), either through training or experience*	● Is aware of potential regulatory violations or deficiencies in anatomic pathology laboratories
Interprets quality data and charts and trends, including proficiency testing results, with supervision	● Assesses quality of quality control slides for immunohistochemical stains ● Compares frozen section to final diagnosis for own cases ● Fills out daily histology quality control sheets for own cases
Level 3 *Identifies the differences between accreditation and regulatory compliance; discusses the process for achieving accreditation and maintaining regulatory compliance*	● Discusses the differences between federally and state-mandated laboratory regulation and specialty specific best practices
Demonstrates knowledge of the components of a laboratory quality management plan	● Actively participates in quality assurance activities, including mandatory second reviews, reconciliation of outside consultant reports, and consensus conferences ● Actively participate in regular laboratory quality management duties ● Review QI reports, participates in QI committees
Level 4 *Participates in an internal or external laboratory inspection*	● Performs mock or self-inspection, or external inspection with faculty members
Reviews the quality management plan to identify areas for improvement	● Assists in troubleshooting quality control or proficiency testing failures (e.g., HistoQIP)

Level 5 *Serves as a resource for accreditation at the regional or national level* *Creates and follows a comprehensive quality management plan*	● Serves on a committee for a regional or national accreditation agency ● Oversees laboratory quality management in concert with the medical director
Assessment Models or Tools	● Direct observation ● Documentation of inspector training and participation ● Participation in laboratory management meetings ● Presentation at M and conferences ● Rotation evaluations
Curriculum Mapping	●
Notes or Resources	● CAP. Inspector Training Options. https://www.cap.org/laboratory-improvement/accreditation/inspector-training. 2020.

Systems-Based Practice 5: Utilization	
Overall Intent: To optimize utilization of tests to ensure both high-quality patient outcomes and stewardship of health care resources	

Milestones	Examples
Level 1 *Identifies general pediatric pathology work practices and workflow (e.g., molecular diagnostic, histology, immunohistochemistry stains, chemical tests, administrative support)*	● Identifies key elements of ordering practices ● Understands turnaround time for routine histology, expedited (i.e., stat) cases, routine and stat immunostains, and additional testing modalities ● Understands the role of CPT codes in pathology billing on a basic level
Level 2 *Explains rationale for test/resource utilization patterns in own practice setting*	● Identifies appropriate or inappropriate ordering and overutilization ● Discusses financial implications of inappropriate ordering and overutilization ● Understands the implications of inappropriate stat requests on overtime for laboratory staff members
Level 3 *Identifies opportunities to optimize utilization of pathology resources*	● Collaborates with departmental leadership to intervene in inappropriate or overutilization situations ● Addresses use of specific tests instead of a complete panel ● Understands the difference between clinical diagnostic and research tumor sequencing
Level 4 *Initiates efforts to optimize utilization*	● Identifies faculty member and co-fellow overutilization of cytogenetic studies, removes up front ordering of stains with low diagnostic yield ● Orders immunohistochemical stains based on carefully considered differential diagnosis to optimize patient care and cost effectiveness ● Discusses with the oncologist the boundaries between clinically relevant and research testing
Level 5 *Completes a utilization review, implements change, and reviews effectiveness*	● Independently or as a collaborator, conducts a utilization review on patterns of ordering immunohistochemical stains for evaluation of small round cell tumors, identifies inappropriate ordering and overutilization in the context of evidence-based best practices, and engages stakeholders in interventions to modify and improve utilization practices and stewardship of resources ● Publishes results of utilization review on a focused topic
Assessment Models or Tools	● Direct observation ● Faculty evaluations of fellow ● Participation in laboratory management and finance meetings ● Planning and completion of a utilization review
Curriculum Mapping	●
Notes or Resources	● Bejjanki H, Mramba LK, Beal SG, et al. The role of a best practice alert in the electronic medical record in reducing repetitive lab tests. *Clinicoecon Outcomes Res*. 2018;10:611-618. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6181108/. 2020.

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Practice-Based Learning and Improvement 1: Evidence-Based Practice and Scholarship	
Overall Intent: To incorporate evidence into clinical practice and contribute to the body of knowledge in pediatric and perinatal pathology	
Milestones	**Examples**
Level 1 *Demonstrates how to access and select applicable evidence* *Is aware of the need for patient privacy, autonomy, and consent as applied to clinical research*	● Understands and accesses national research databases, journals, protocols, and textbooks relevant to pediatric pathology ● Identifies the need for an Institutional Review Board (IRB) approval when collecting cases for a possible research project
Level 2 *Identifies and applies the best available evidence to guide diagnostic work-up of simple cases* *Develops knowledge of the basic principles of research (demographics, Institutional Review Board, human subjects), including how research is evaluated, explained to patients, and applied to patient care*	● Uses national research databases, journals, protocols, and textbooks relevant to pediatric pathology ● Drafts an IRB protocol with attending oversight
Level 3 *Identifies and applies the best available evidence to guide diagnostic work-up of complex cases* *Applies knowledge of the basic principles of research such as informed consent and research protocols to clinical practice, with supervision*	● Uses national research databases, journals, protocols, and textbooks relevant to pediatric pathology in order to guide ordering molecular testing or sequencing for unusual pediatric tumors ● Drafts an IRB protocol with minimal oversight ● Completes research project and submits an abstract for a national meeting
Level 4 *Critically appraises and applies evidence to guide care, even in the face of conflicting data* *Proactively and consistently applies knowledge of the basic principles of research such as informed consent and research protocols to clinical practice*	● Appropriately researches the primary literature to explain rare molecular findings ● Independently designs a research project, including IRB submission ● Submits a paper for publication

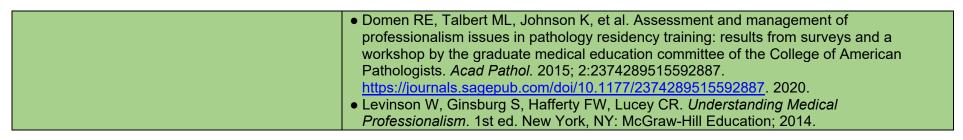|	
Level 5 *Teaches others to critically appraise and apply evidence for complex cases; and/or participates in the development of guidelines* *Suggests improvements to research regulations and/or substantially contributes to the primary literature through basic, translational, or clinical research*	● Moderates a discussion with clinicians over disparate molecular, morphologic, and immunohistochemical findings of a tumor to formulate the best course forward based on the primary literature ● Submits a grant proposal
Assessment Models or Tools	● Direct observation ● Participation in IRB ● Presentation, including at national meetings ● Research portfolio
Curriculum Mapping	●
Notes or Resources	● Academic journal submission guidelines ● CITI Program. Research Ethics and Compliance Training. https://about.citiprogram.org/en/homepage/. 2020. ● Local IRB guidelines ● Local/institutional medical library website/database subscriptions ● National Institutes of Health. Write Your Application. https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/write-your-application.htm. 2020. ● U.S. National Library of Medicine. PubMed Tutorial. https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html. 2020.

Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth	
Overall Intent: To seek clinical performance information with the intent to improve care; reflects on all domains of practice, personal interactions, and behaviors; develop clear objectives and goals for improvement	
Milestones	**Examples**
Level 1 *Accepts responsibility for personal and professional development by establishing goals* *Identifies the gap(s) between expectations and actual performance* *Actively seeks opportunities to improve*	● Is aware of need to improve and receptive to constructive feedback ● Humbly acts on input and is appreciative and not defensive ● Critically reads evaluations to become aware of strengths and weaknesses ● Performs self-assessment ● Asks for resources for suggested reading
Level 2 *Demonstrates openness to receiving performance data and feedback in order to inform goals* *Analyzes and reflects on the factors which contribute to gap(s) between expectations and actual performance* *Designs and implements a learning plan, with assistance*	● Increasingly able to identify performance gaps in terms of diagnostic skills and daily work; uses feedback from others ● After working with an attending for a week, asks about performance and opportunities for improvement ● Uses feedback with a goal of improving communication skills with technologists, peers/colleagues, and staff the following week ● Starts a reading plan to improve medical knowledge
Level 3 *Seeks performance data and feedback with humility* *Institutes behavioral change(s) to narrow the gap(s) between expectations and actual performance* *Independently creates and implements a learning plan*	● Takes input from technologists, peers/colleagues, and supervisors to gain complex insight into personal strengths and areas to improve ● Actively seeks feedback from the pathologist assistant to improve handling of complex specimens ● Independently develops a reading program for a major pediatric pathology textbook and demonstrates weekly progress towards that goal
Level 4 *Actively and consistently seeks performance data and feedback with humility* *Critically evaluates the effectiveness of behavioral changes in narrowing the gap(s) between expectations and actual performance*	● Is perceived by all staff members to be humble, open to learning, and receptive to constructive criticism ● Consistently identifies ongoing gaps and chooses areas for further development ● Consistently makes a learning plan for each rotation

Uses performance data to measure the effectiveness of the learning plan and improves it when necessary	● Uses results from pediatric in-service exam to target areas of weakness via slide study sets, directed reading, and discussions with faculty member experts
Level 5 *Models seeking performance data and accepting feedback with humility*	● Actively discusses learning goals with supervisors and colleagues
Coaches others in reflective practice	● Encourages other learners on the team to consider how their behavior affects the rest of the team
Facilitates the design and implementing of learning plans for others	● Offers self-designed performance improvement plan to fellowship program director and other colleagues
Assessment Models or Tools	● Direct observation ● Multisource feedback ● Pediatric in-service exam ● Portfolio ● Review of learning plan ● Self-reflection ● Semi-annual performance reviews
Curriculum Mapping	●
Notes or Resources	● Burke AE, Benson B, Englander R, Carraccio C, Hicks PJ. Domain of competence: practice-based learning and improvement. *Acad Pediatr.* 2014;14: S38-S54. https://www.academicpedsjnl.net/article/S1876-2859(13)00333-1/fulltext. 2020. ● Hojat M, Veloski JJ, Gonnella JS. Measurement and correlates of physicians' lifelong learning. *Academic Medicine.* 2009;84(8):1066-1074. https://journals.lww.com/academicmedicine/fulltext/2009/08000/Measurement_and_Correlates_of_Physicians__Lifelong.21.aspx. 2020. ● Lockspeiser TM, Schmitter PA, Lane JL, Hanson JL, Rosenberg AA, Park YS. Assessing residents' written learning goals and goal writing skill: validity evidence for the learning goal scoring rubric. *Academic Medicine*. 2013;88(10):1558-1563. https://journals.lww.com/academicmedicine/fulltext/2013/10000/Assessing_Residents__Written_Learning_Goals_and.39.aspx. 2020.

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

Milestones	Examples
Level 1 *Demonstrates knowledge of the ethical principles underlying informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics* *Describes when and how to appropriately report professionalism lapses, including strategies for addressing common barriers; identifies and describes potential triggers for professionalism lapses*	● Identifies and describes potential triggers for professionalism lapses, describes when and how to appropriately report professionalism lapses, and outlines strategies for addressing common barriers to reporting ● 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) ● Obtains informed consent for procedures
Level 2 *Analyzes straightforward situations using ethical principles* *Demonstrates insight into professional behavior in routine situations; takes responsibility for one's own professionalism lapses*	● Demonstrates professional behavior in routine situations and uses ethical principles to analyze straightforward situations, and can acknowledge a lapse without becoming defensive, making excuses, or blaming others ● Apologizes for the lapse when appropriate and taking steps to make amends if needed ● Articulates strategies for preventing similar lapses in the future ● Monitors and responds to fatigue, hunger, stress, etc. in self and team members ● Recognizes and responds effectively to the emotions of others

Level 3 *Recognizes the need and uses relevant resources to seek help in managing and resolving complex ethical situations*
 	
Demonstrates professional behavior in complex or stressful situations
	● Analyzes complex situations, such as how the clinical situation evokes strong emotions, conflicts (or perceived conflicts) among patients/providers/staff members or between professional values; navigates a situation while not at personal best (due to fatigue, hunger, stress), or the system poses barriers to professional behavior (e.g., inefficient workflow, inadequate staffing, conflicting policies)
	● Recognizes own limitations and seeks resources to help manage and resolve complex ethical situations such as:
	  o consulting with a genetic counselor about the implications of genetic testing
	  o requesting an ethics consult
	
	● Analyzes difficult real or hypothetical ethics and professionalism case scenarios or situations, recognizes own limitations, and consistently demonstrates professional behavior

Level 4 *Independently resolves and manages complex ethical situations* *Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in self and others*	● Actively seeks to consider the perspectives of others ● Models respect for patients and expects the same from others ● Recognizes and utilizes appropriate resources for managing and resolving ethical dilemmas (e.g., ethics consultations, literature review, risk management/legal consultation)
Level 5 *Identifies and seeks to address system-level factors that induce or exacerbate ethical problems or impede their resolution* *Coaches others when their behavior fails to meet professional expectations*	● Coaches others when their behavior fails to meet professional expectations, either in the moment or after the moment ● Identifies and seeks to address system-wide factors or barriers to promoting a culture of ethical and professional behavior through participation in a work group, committee, or task force (e.g., ethics committee or an ethics sub-committee, risk management committee, root cause analysis review, patient safety or satisfaction committee, professionalism work group, IRB, trainee grievance committee, etc.)
Assessment Models or Tools	● Direct observation ● Multisource feedback ● Oral or written self-reflection ● Simulation
Curriculum Mapping	●
Notes or Resources	● American Medical Association. Ethics. https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. 2020. ● Brissette MD, Johnson K, Raciti PM, et al. Perceptions of unprofessional attitudes and behaviors: implications for faculty role modeling and teaching professionalism during pathology residency. *Arch Pathol Lab Med.* 2017;141:1349-1401. https://www.archivesofpathology.org/doi/10.5858/arpa.2016-0477-CP. 2020. ● Byyny RL, Papadakis MA, Paauw DS. *Medical Professionalism Best Practices*. Menlo Park, CA: Alpha Omega Alpha Medical Society; 2015. https://alphaomegaalpha.org/pdfs/2015MedicalProfessionalism.pdf. 2019. ● Conran RM, Powell SZ, Domen RE, et al. Development of professionalism in graduate medical education: a case-based educational approach from the College of American Pathologists' Graduate Medical Education Committee. 2018;5: 2374289518773493. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6039899/. 2020. ● Domen RE, Johnson K, Conran RM, et al. Professionalism in pathology: a case-based approach as a potential education tool. *Arch Pathol Lab Med*. 2017;141:215-219. https://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. 2020.

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Professionalism 2: Accountability and Conscientiousness
Overall Intent: To take responsibility for one's own actions and the impact on patients and other members of the health care team

Milestones	Examples
Level 1 *Responds promptly to instructions, requests, or reminders to complete tasks and responsibilities*	● Responds promptly to reminders from program administrator to complete work hour logs or evaluations ● Timely attendance at conferences ● Responds promptly to requests to complete preliminary anatomic diagnosis report on an autopsy
Level 2 *Takes ownership and performs tasks and responsibilities in a timely manner with attention to detail*	● Completes autopsy reports in a timely manner and recognizes when it will be difficult to complete that task (e.g., going out of town, awaiting brain cutting) and knows deadline for autopsy completion during vacation time ● Completes cases (any) in a timely manner, with attention to detail, including reporting of all immunohistochemical stains ● Completes and documents safety modules, procedure review, and licensing requirements (e.g., administrative duties and tasks)
Level 3 *Recognizes situations that may impact own ability to complete tasks and responsibilities in a timely manner and describes the impact on team*	● Appropriately notifies colleagues on day service about overnight call events during transition of care or hand-off in order to avoid patient safety issues and compromise of patient care ● Completes tasks in stressful situations and preempts issues that would impede completion of tasks (e.g., notifies attending of multiple competing demands on call, appropriately triages tasks, and asks for assistance from other colleagues, if needed)
Level 4 *Anticipates and intervenes in situations that may impact others' ability to complete tasks and responsibilities in a timely manner*	● Identifies issues that could impede other colleagues from completing tasks and provides leadership to address those issues ● Takes responsibility for potential adverse outcomes from mishandled specimen and professionally discusses with the interprofessional team
Level 5 *Takes ownership of system outcomes, and implements new strategies when necessary*	● Sets up a meeting with the lead technologist to streamline an ordering process and follows through with a system-based solution ● Writes specimen hand-off policy
Assessment Models or Tools	● Compliance with deadlines and timelines ● Direct observation ● Multisource feedback ● Quality metrics of turnaround time on cases ● Self-evaluations and reflective tools
Curriculum Mapping	●
Notes or Resources	● Code of conduct from fellow/resident institutional manual ● Institutional/shared calendaring, email, checklist, and handoff tools

Professionalism 3: Self-Awareness and Help-Seeking	
Overall Intent: To identify, use, manage, improve, and seek help for personal and professional well-being for self and others	

Milestones	Examples
Level 1 *Recognizes limitations in the knowledge/skills/ behaviors of self or team, with assistance*	● Accepts feedback and exhibits positive responses to criticism
Recognizes status of personal and professional well-being, with assistance	● Aware of institutional training to identify and prevent physician burnout ● Understands the need for community and personal support while in training ● Aware of institutional wellness resources
Level 2 *Independently recognizes limitations in the knowledge/skills/ behaviors of self or team and seeks help when needed*	● Identifies possible sources of personal stress or lack of clinical knowledge and independently seeks help
Independently recognizes status of personal and professional well-being and seeks help when needed	● Uses institutional wellness resources ● Completes institutional training to identify and prevent physician burnout
Level 3 *Proposes and implements a plan to remediate or improve the knowledge/ skills/behaviors of self or team, with assistance*	● With supervision, designs debriefing session for team following stressful series of frozen sections
Proposes and implements a plan to optimize personal and professional well-being, with assistance	● With supervision, assists in developing a plan to address stress and burnout, for self or team ● Discusses a change in rotation schedule due to personal life stressor that impacts performance
Level 4 *Independently develops and implements a plan to remediate or improve the knowledge/skills/ behaviors of self or team*	● Independently develops personal learning or action plans for continued personal and professional growth, and limits stress and burnout for self or team ● Leads a debriefing session for team members following emotionally difficult autopsy
Independently develops and implements a plan to optimize personal and professional well-being	● Implements a change in rotation schedule due to personal life stressor that impacts performance ● Organizes hobbies, community activities and family life around rotation schedule
Level 5 *Serves as a resource or consultant for developing a plan to remediate or improve the knowledge/ skills/behaviors*	● Mentors colleagues in self-awareness, work-life balance, and burnout awareness and prevention

Coaches others when responses or limitations in knowledge/skills do not meet professional expectations	● Mentors colleagues to minimize lapses in professional attitudes and interpersonal communication in response to stress
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, but to ensure each fellow has the fundamental knowledge of factors that impact well-being, the mechanisms by which those factors impact well-being, and available resources and tools to improve well-being. ● ACGME. "Well-Being Tools and Resources." https://dl.acgme.org/pages/well-being-tools-resources. Accessed 2022. ● Conran RM, Powell SZ, Domen RE, et al. Development of professionalism in graduate medical education: a case-based educational approach from the College of American Pathologists' Graduate Medical Education Committee. *Acad Pathol*. 2018;5:2374289518773493. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6039899/. 2020. ● Hicks PJ, Schumacher D, Guralnick S, Carraccio C, Burke AE. Domain of competence: personal and professional development. *Acad Pediatr*. 2014;14(2 Suppl):S80-97. https://linkinghub.elsevier.com/retrieve/pii/S1876-2859(13)00332-X. 2020. ● Joseph L, Shaw PF, Smoller BR. Perceptions of stress among pathology residents: survey results and some strategies to reduce them. *Am J Clin Pathol*. 2007;128(6):911-919. https://academic.oup.com/ajcp/article/128/6/911/1764982. 2020. ● Local resources, including Employee Assistance program

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication	
Overall Intent: To deliberately use language and behaviors to form constructive relationships with patients, to identify communication barriers including self-reflection on personal biases, and minimize them in the doctor-patient relationships; organize and lead communication around shared decision making	
Milestones	**Examples**
Level 1 *Uses language and nonverbal behavior to demonstrate respect and establish rapport* *Identifies common barriers to effective communication (e.g., language, disability) while accurately communicating own role within the health care system*	● Self-monitors and controls tone, non-verbal responses, and language and asks questions to invite patient/family participation ● Avoids medical jargon when talking to patients ● Makes sure communication is at the appropriate level to be understood by a layperson ● Identifies self as pediatric pathology fellow when discussing a pathology report or performing a fine needle aspiration
Level 2 *Establishes a relationship in straightforward encounters using active listening and clear language* *Identifies complex barriers to effective communication (e.g., health literacy, cultural)*	● Prior to a fine needle aspiration, organizes and initiates the informed consent process, actively listens to concerns about the procedure, and clearly answers questions ● Uses translation service to share autopsy findings with family members ● Tailors discussion of pathology report findings to the family's educational level
Level 3 *Sensitively and compassionately delivers medical information, with supervision* *When prompted, reflects on personal biases while attempting to minimize communication barriers*	● Discusses and writes autopsy reports with the family in mind as an audience; avoids emotionally fraught language, with supervision ● Discusses surgical pathology reports sensitively with patients when asked, with supervision ● When prompted, acknowledges personal "desire to please" and recognizes tendency to give concrete answers when none are available
Level 4 *Independently, sensitively, and compassionately delivers medical information and acknowledges uncertainty and conflict* *Independently recognizes personal biases while attempting to proactively minimize communication barriers*	● Sensitively handles fetopsy remains; tactfully writes reports resulting from a potentially avoidable peripartum death ● Participates in the sharing of autopsy findings in face of family anger or medical error ● Writes reports with nuance, acknowledging personal "desire to please" and does not give concrete answers when none are available ● Recognizes individual cognitive biases (anchoring, confirmation bias) in diagnostic pathology
Level 5 *Mentors others in the sensitive and compassionate delivery of medical information*	● Leads the sharing of autopsy findings in face of family anger or medical error ● Models writing autopsy reports, or surgical pathology report comments, which acknowledge potential clinical mismanagement

Models self-awareness while teaching a contextual approach to minimize communication barriers	● Serves on hospital committees or initiatives to improve communication and handle error disclosure ● Runs resident teaching sessions with mock pathologist-patient information disclosure
Assessment Models or Tools	● Direct observation ● Pathology draft report review ● Self-assessment including self-reflection exercises ● Simulation
Curriculum Mapping	●
Notes or Resources	● Dintzis SM. Improving pathologist's communication skills. *AMA J Ethics*. 2016;18(8):802-808. https://journalofethics.ama-assn.org/article/improving-pathologists-communication-skills/2016-08. 2020. ● Dintzis SM, Stetsenko GY, Sitlani CM, et al. Communicating pathology and laboratory errors: anatomic pathologists' and laboratory medical directors' attitudes and experiences. *Am J Clin Pathol*. 2011;135(5):760-765. https://academic.oup.com/ajcp/article/135/5/760/1766306. 2020. ● Laidlaw A, Hart J. Communication skills: an essential component of medical curricula. Part I: Assessment of clinical communication: AMEE Guide No. 51. *Med Teach*. 2011;33(1):6-8. https://www.tandfonline.com/doi/full/10.3109/0142159X.2011.531170. 2020. ● Symons AB, Swanson A, McGuigan D, Orrange S, Akl EA. A tool for self-assessment of communication skills and professionalism in residents. *BMC Med Educ*. 2009;9:1. https://bmcmededuc.biomedcentral.com/articles/10.1186/1472-6920-9-1. 2020.

Interpersonal and Communication Skills 2: Interprofessional and Team Communication	
Overall Intent: To effectively communicate with the health care team, including both inter- and intra-departmental and consultants, in both straightforward and complex situations	
Milestones	**Examples**
Level 1 *Uses language that values all members of the health care team*	● Shows respect in health care team communications through words and actions such as in requests for intraoperative consultation or clinical consultation for fine needle aspirations ● Uses respectful communication with clerical and technical staff members ● Listens to and considers others' points of view, is nonjudgmental and actively engaged, and demonstrates humility
Describes the utility of constructive feedback	● Understands constructive feedback from the team can help improve future communications
Level 2 *Communicates information effectively with all health care team members*	● Verifies understanding of own communications within the health care team (i.e., closed-loop communications, restating for critical values and unexpected diagnoses, follows up in laboratory with technologists) ● Demonstrates active listening by fully focusing on the speaker, actively showing verbal and non-verbal signs
Solicits feedback on performance as a member of the health care team	● Asks for feedback from the pathologist's assistant regarding communication and documentation related to a complex specimen hand-off
Level 3 *Uses active listening to adapt communication style to fit team needs*	● Verifies understanding by clinical physician of an unexpected diagnosis ● Requests a verbal read-back of frozen section results from surgeon
Integrates feedback from team members to improve communication	● Modifies documentation of on-call specimen triage in response to prior feedback
Level 4 *Coordinates recommendations from different members of the health care team to optimize patient care*	● Offers suggestions to negotiate or resolve conflicts among health care team members
Communicates feedback and constructive criticism to superiors	● Respectfully points out error in pathology report or missed diagnosis identified on secondary review for conference presentation to attending physician
Level 5 *Models flexible communication strategies that value input from all health care team members, resolving conflict when needed*	● Serves as a role model in communication with all health care team members, resolution of conflicts, and providing feedback
Facilitates regular health care team-based feedback in complex situations	● Organizes a team meeting to discuss and resolve potentially conflicting points of view on a diagnostic approach

Assessment Models or Tools	● Direct observation ● Medical multisource feedback ● Record (chart) review ● Simulation
Curriculum Mapping	●
Notes or Resources	● Brissette MD, Johnson K, Raciti PM, et al. Perceptions of unprofessional attitudes and behaviors: implications for faculty role modeling and teaching professionalism during pathology residency. *Arch Pathol Lab Med*. 2017;141:1394-1401. https://www.archivesofpathology.org/doi/10.5858/arpa.2016-0477-CP. 2020. ● Conran RM, Powell SZ, Domen RE, et al. Development of professionalism in graduate medical education: a case-based educational approach from the College of American Pathologists' Graduate Medical Education Committee. 2018;5: 2374289518773493. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6039899/. 2020. ● Green M, Parrott T, Cook G., Improving your communication skills. *BMJ*. 2012;344:e357. https://www.bmj.com/content/344/bmj.e357. 2020. ● Henry SG, Holmboe ES, Frankel RM. Evidence-based competencies for improving communication skills in graduate medical education: a review with suggestions for implementation. *Med Teach*. 2013;35(5):395-403. https://www.tandfonline.com/doi/full/10.3109/0142159X.2013.769677. 2020. ● Nakhleh RE, Myers JL, Allen TC, et al. Consensus statement on effective communication of urgent diagnoses and significant, unexpected diagnoses in surgical pathology and cytopathology from the College of American Pathologists and Association of Directors of Anatomic and Surgical Pathology. *Arch Pathol Lab Med*. 2012;136(2):148-154. https://www.archivesofpathology.org/doi/10.5858/arpa.2011-0400-SA?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed. 2020. ● Roth CG, Eldin KW, Padmanabhan V, Freidman EM. Twelve tips for the introduction of emotional intelligence in medical education. *Med Teach*. 2019;41(7):1-4. https://www.tandfonline.com/doi/full/10.1080/0142159X.2018.1481499. 2020.

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

Milestones	Examples
Level 1 *Safeguards patient personal health information by communicating through appropriate means as required by institutional policy (e.g., patient safety reports, cell phone/pager usage)*	● Identifies when it is acceptable to include protected health information in various forms of communication
Identifies institutional and departmental structure for communication of issues	● Knows the organizational structure and options for reporting concerns
Level 2 *Selects forms of communication based on context and urgency of the situation*	● Immediately pages pathology attending when previewing a case and diagnosing invasive fungal disease ● Sends secure email to pathology attending when there has been a routine autopsy notification
Respectfully communicates concerns about the system	● Recognizes when a communication breakdown has happened and respectfully brings the issue to the attention of a faculty member
Level 3 *Communicates while ensuring security of personal health information, with supervision*	● Demonstrates adept use of institutional paging, secure messaging, EHR-based messaging, and secure texting platforms to communicate patient results, with supervision
Uses institutional structure to effectively communicate clear and constructive suggestions to improve the system	● Knows when to direct concerns locally, departmentally, or institutionally ● Improves methods for communicating system-wide call schedules, conference scheduling, etc.
Level 4 *Independently communicates while ensuring security of personal health information*	● Independently demonstrates adept use of institutional paging, secure messaging, EHR-based messaging, and secure texting platforms to communicate patient results
Initiates conversations on difficult subjects with appropriate stakeholders to improve the system	● Participates in task force to update policy for sharing abnormal results ● Communicates opportunities to departmental informatician or hospital information technology (IT) for improvement in the LIS/EHR interface
Level 5 *Guides departmental or institutional communication around policies and procedures regarding the security of personal health information*	● Leads a task force established by the hospital QI committee to develop a plan to improve house staff secure messaging utilization

Facilitates dialogue regarding systems issues among larger community stakeholders (institution, health care system, field)	● Works with information systems to implement improvements in the LIS/EHR interface
Assessment Models or Tools	● Chart review for documented communications ● Multisource feedback ● Observation of sign-outs, observation of requests for consultations ● Participation in departmental and institutional meetings
Curriculum Mapping	●
Notes or Resources	● Bierman JA, Hufmeyer KK, Liss DT, Weaver AC, Heiman HL. Promoting responsible electronic documentation: validity evidence for a checklist to assess progress notes in the electronic health record. *Teach Learn Med.* 2017;29(4):420-432. https://www.tandfonline.com/doi/full/10.1080/10401334.2017.1303385. 2020. ● Haig KM, Sutton S, Whittington J. SBAR: a shared mental model for improving communication between clinicians. *Jt Comm J Qual Patient Saf.* 2006;32(3):167-175. https://www.jointcommissionjournal.com/article/S1553-7250(06)32022-3/fulltext. 2020.

To help programs transition to the new version of the Milestones, the original Milestones 1.0 have been mapped to the new Milestones 2.0. Below it is indicated where the subcompetencies are similar between versions. These are not exact matches but include some of the same 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: Procedure: Surgical Pathology Grossing	PC1: Pediatric and Perinatal Pathology Grossing (Examine, Describe, Triage, Sample, and Document)
PC2: Procedure: Intra-operative Consultation/Frozen Section	PC2: Intra-Operative Consultation (Frozen Sections, Rapid Onsite Evaluation of Fine Needle Aspiration)
PC3: Procedure: Autopsy	PC3: Autopsy
PC4: Reporting	PC4: Reporting, including Surgical Pathology, Cytopathology, and Autopsy
MK1: Knowledge of Perinatal and Pediatric Disease	MK1: Knowledge of Pediatric and Perinatal Diseases
MK2: Application of Knowledge of Perinatal and Pediatric Disease to Clinical Situations	MK2: Clinical Reasoning
MK3: Application of Clinical Laboratory Testing	MK2: Clinical Reasoning
SBP1: Regulatory and Compliance: Accreditation Management	SBP4: Accreditation, Compliance, and Quality
SBP2: Health Care teams	SBP2: Systems Navigation for Patient-Centered Care ICS2: Interprofessional and Team Communication
SBP3: Lab Management: Resource Utilization (personnel and finance)	SBP 3: Physician Role in Health Care System SBP5: Utilization
PBLI1: Evidence-based Utilization	PBLI1: Evidence-Based Practice and Scholarship SBP5: Utilization
PBLI2: Process Improvement and Patient Safety	SBP1: Patient Safety and Quality Improvement (QI)
PROF1: Receiving and Providing Feedback	PBLI2: Reflective Practice and Commitment to Personal Growth
PROF2: Accountability, Honesty, and Integrity	PROF1: Professional Behavior and Ethical Principles PROF2: Accountability and Conscientiousness PROF3: Self-Awareness and Help-Seeking
PROF3: Cultural Competency	SBP2: Systems Navigation for Patient-Centered Care ICS1: Patient and Family-Centered Communication
ICS1: Communication with Health Care Providers, Families, and Patients (as applicable)	ICS1: Patient and Family-Centered Communication ICS2: Interprofessional and Team Communication
ICS2: Personnel Management and Conflict Resolution	ICS2: Interprofessional and Team Communication
	ICS3: Communication within Health Care Systems

Available Milestones Resources

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

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

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

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

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

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

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

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

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

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