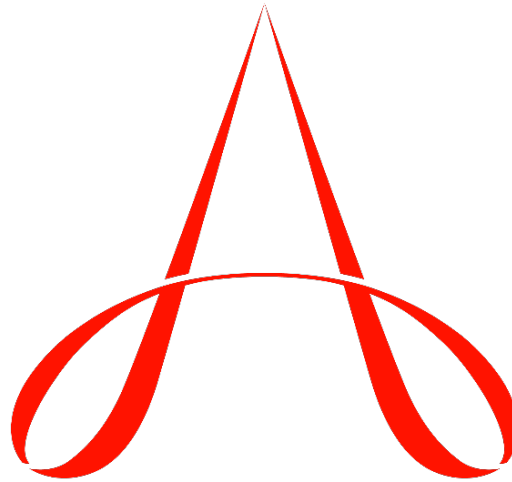




Supplemental Guide: Pediatric Transplant Hepatology



A C G M E

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Milestones Supplemental Guide

This document provides additional guidance and examples for the Pediatric Transplant Hepatology 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 at the end of this document as well as on the [Resources](#) page of the Milestones section of the ACGME website.

Patient Care 1: History and Physical Exam	
Overall Intent: To perform patient history and physical exam with the level of detail and focus required for the individual patient	
Milestones	Examples
Level 1 <i>Acquires a comprehensive and developmentally appropriate pediatric medical history and physical examination</i>	• In taking the history of a patient presenting to the clinic, asks questions pertinent to the chief complaint • Reviews available medical records • Performs a complete physical examination pertinent to age
Level 2 <i>Acquires a pediatric transplant hepatology history and focused physical examination, including pertinent positives and negatives</i>	• Using elements of the chief complaint and review of systems, appropriately focuses information gathering to characterize severity for a patient with signs and symptoms of liver injury • Asks questions pertinent to liver disease • Identifies relevant findings in the medical record • Identifies important liver exam findings like jaundice, scleral icterus, hepatosplenomegaly, and skin lesions
Level 3 <i>Acquires a focused pediatric transplant hepatology history with historical subtleties, including psychosocial and physical functioning, and performs a focused physical examination</i>	• Uses an organized and descriptive approach to discuss common issues in a liver transplant recipient • Reviews barriers that interfere with medication compliance • Incorporates social determinants of health or other social screening questions when performing history • Independently requests additional information to supplement available medical records • Identifies ascites, spider nevi, asterixis, and signs of malnutrition
Level 4 <i>Acquires the complete patient history and physical examination, interprets subtleties, and determines tailored assessment of disease activity for a patient with a complex presentation</i>	• Recognizes during history taking the nuanced risk factors of complex and progressive liver disease processes and gathers the necessary information to help elucidate the diagnosis • Obtains a targeted history of a patient with biliary atresia post Kasai who is presenting with pruritus and growth difficulties • Requests mid-upper arm circumference and skin fold thickness to evaluate extent of malnutrition for infants with cholestasis • Identifies lymphadenopathy, abnormal skin findings, and tonsillar hypertrophy in liver transplant recipients
Level 5 <i>Serves as a role model in acquiring the complete patient history and physical examination, interpreting subtleties, recognizing ambiguities, and determining tailored assessment of disease activity for a patient with a complex presentation</i>	• Teaches nuanced history taking for a patient with end-stage liver disease on parenteral nutrition, such as number of central line-associated blood stream infections/line replacements, growth, and future transplant risk • Teaches the nuances of examining a patient with teeth discoloration, growth difficulties, cutaneous xanthomas, and progressive jaundice, physical exam findings that are pathognomonic for Alagille syndrome

Pediatric Transplant Hepatology Supplemental Guide

Assessment Models or Tools	• Case-based discussion • Direct observation • Medical record (chart) review • Multisource feedback • Oral patient presentations review
Curriculum Mapping	•
Notes or Resources	• Ayoub, Mohammed D., and Binita M. Kamath. 2022. "Alagille Syndrome: Current Understanding of Pathogenesis, and Challenges in Diagnosis and Management." <i>Clinics in Liver Disease</i> 26(3): 355-370. doi:10.1016/j.cld.2022.03.002. • DiLeo Thomas, Liza, and Megan C. Henn. 2021. "Perfecting the Gastrointestinal Physical Exam: Findings and Their Utility and Examination Pearls." <i>Emergency Medicine Clinics of North America</i> 39(4): 689-702. doi: 10.1016/j.emc.2021.07.004. • Normatov, Inessa, Shiran Kaplan, and Ruba K. Azzam. 2018. "Nutrition in Pediatric Chronic Liver Disease." <i>Pediatric Annals</i> 47(11) :445-451. doi: https://doi.org/10.3928/19382359-20181022-03.

Patient Care 2: Organization and Prioritization of Patient Care Overall Intent: To organize and appropriately prioritize patient care	
Milestones	Examples
Level 1 <i>Organizes patient care tasks, with assistance</i>	• Sees patient with ascites and recommends imaging, with guidance from attending • Calls the attending after the consult to determine when to re-evaluate patient
Level 2 <i>Organizes patient care tasks and needs assistance for patients with complex disease; recognizes urgent or emergent issues</i>	• Recommends labs, imaging, antibiotics, and possible paracentesis for a patient with biliary atresia with ascites and fevers in the emergency department, with assistance • Evaluates a patient with end-stage liver disease with tachycardia and melena and confirms with attending the need for urgent endoscopic management and possible sclerotherapy versus banding • Recognizes emergent nature of acute liver failure and triages appropriately
Level 3 <i>Prioritizes patient care tasks with efficiency; anticipates urgent and emergent issues</i>	• While admitting a stable liver transplant recipient with fevers and lymphadenopathy, gets notified of a gastrointestinal bleed in a patient awaiting liver transplant and prioritizes the second patient to discuss with attending • Notifies the transplant surgeon of bilious output from Jackson-Pratt (JP) drain on post-operative day two and requests urgent imaging, simultaneously notifying the hepatology attending/proceduralist of an acute hemoglobin drop post liver biopsy
Level 4 <i>Prioritizes patient care tasks and manages service independently</i>	• After rounds, helps allocate tasks among team members, obtains consent for upcoming procedures, and discusses with patient/family the risks and benefits of steroids in new diagnosis of autoimmune hepatitis • After receiving several pages during clinic, appropriately triages urgent issues and reaches out to others for help when needed
Level 5 <i>Serves as a role model for organizing, prioritizing, and managing patient care tasks</i>	• Organizes a multidisciplinary meeting to discuss the needs of a patient with complex disease and brainstorms best practices moving forward
Assessment Models or Tools	• Case-based discussion • Direct observation • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• Katkin, Julie P., Susan J. Kressly, Anne R. Edwards, James M. Perrin, Colleen A. Kraft, Julia E. Richerson, Joel S. Tieder, and Liz Wall; Task Force on Pediatric Practice Change. 2017. "Guiding Principles for Team-Based Pediatric Care." <i>Pediatrics</i> 140(2): e20171489. doi: 10.1542/peds.2017-1489. PMID: 28739656.

Patient Care 3: Patient Management in Pediatric Transplant Hepatology Overall Intent: To develop a comprehensive care plan for liver disease based on disease presentation and urgency	
Milestones	Examples
Level 1 <i>Requires direct supervision to deliver patient care</i>	• Reviews with supervisor treatment strategy to adjust immunosuppression for a patient with acute cellular rejection • Develops treatment plan of pruritus in patient with Alagille syndrome, with direct supervision
Level 2 <i>Manages patients with straightforward diagnoses, with minimal assistance</i>	• Titrates diuretics for patients with ascites with minimal assistance • Implements increasing immunosuppression for patients with acute cellular rejection with minimal assistance • Develops treatment plan of pruritus in patient with Alagille syndrome, with minimal assistance
Level 3 <i>Independently manages patients with straightforward diagnoses</i>	• Implements and independently discusses with patient increasing immunosuppression for treatment of acute cellular rejection, including possible complications and expected treatment outcome • Prescribes treatment for pruritus in patient with Alagille syndrome • Independently develops and implements a plan for steroid taper for a patient with autoimmune hepatitis and monitors response, adjusting steroid dose between visits
Level 4 <i>Independently manages patients with complex and undifferentiated syndromes, and recognizes disease presentations that deviate from common patterns</i>	• Adjusts plan of care when patient with acute cellular rejection is not responding to treatment as expected • Facilitates transplant evaluation for refractory pruritus in patient with Alagille syndrome • Independently manages patients with autoimmune hepatitis with lack of response to steroid therapy • Determines timing for transplant evaluation for patient not responding to treatment of autoimmune hepatitis and evolving complications associated with end-stage liver disease
Level 5 <i>Effectively manages unusual or rare disorders</i>	• Proposes plan for escalation of care for patient with significant graft dysfunction from possible antibody-mediated rejection • Formulates treatment plan for a patient with rare genetic liver disease (e.g., DCDC2 genetic mutation) after reaching out to experts in the field outside of the institution
Assessment Models or Tools	• Direct observation • Medical record (chart) review • Multisource feedback
Curriculum Mapping	•
Notes or Resources	• Garcia-Tsao, Guadalupe, Arun J. Sanyal, Norman D. Grace, and William Carey; Practice Guidelines Committee of the American Association for the Study of Liver Diseases; Practice Parameters Committee of the American College of Gastroenterology. 2007.

- “Prevention and Management of Gastroesophageal Varices and Variceal Hemorrhage in Cirrhosis.” *American Journal of Gastroenterology* 102(9): 2086–2102. doi: 10.1002/hep.21907.
- Lee, William M., R. Todd Stravitz, and Anne M. Larson. 2011. “Introduction to the Revised American Association for the Study of Liver Diseases Position Paper on Acute Liver Failure.” *Hepatology* 55(3): 965-7.
<https://aasldpubs.onlinelibrary.wiley.com/doi/epdf/10.1002/hep.25551>.
 - Lindor, Keith D., Christopher L. Bowlus, James Boyer, Cynthia Levy, and Marlyn Mayo 2018. “Primary Biliary Cholangitis: 2018 Practice Guidance from the American Association for the Study of Liver Disease.” *Hepatology* 69(1): 394-419.
<https://aasldpubs.onlinelibrary.wiley.com/doi/full/10.1002/hep.30145>.
 - Manns, Michael P., Albert J. Czaja, James D. Gorham, Edward L. Krawitt, Giorgia Mieli-Vergani, Diego Vergani, and John M. Vierling; American Association for the Study of Liver Diseases. 2010. “Diagnosis and Management of Autoimmune Hepatitis.” *Hepatology* 51(6): 2193-213. doi:10.1002/hep.23584.
 - Runyon, Bruce, AASLD Practice Guidelines Committee. 2009. “Management of Adult Patients with Ascites Due to Cirrhosis: An Update.” *Hepatology* 49(6): 2087-107.
<https://aasldpubs.onlinelibrary.wiley.com/doi/full/10.1002/hep.22853>.
 - Stanley, Adrain J., and Loren Laine. 2019. “Management of Acute Upper Gastrointestinal Bleeding.” *BMJ* 364:l536. <https://www.bmj.com/content/364/bmj.l536.long>.

Patient Care 4: Transplant Hepatology Procedures Overall Intent: To independently perform all aspects of the pre- and post-procedural assessment, including evaluation of complications	
Milestones	Examples
Level 1 <i>Identifies indications for procedures</i>	- Identifies need for liver biopsy in a patient with elevated liver enzymes post-transplant - With assistance, performs peri-procedural assessment for a liver biopsy - Identifies need for endoscopy in a patient with portal hypertension presenting with melena
Level 2 <i>Performs peri-procedural assessment and explains diagnostic procedures, including possible complications</i>	- Determines need for a liver biopsy, evaluates patient, and checks labs/imaging studies to ensure safety for the patient - Determines the need for endoscopy, including possible complications such as increased incidence of post-procedural bleeding
Level 3 <i>Independently performs peri-procedural assessment and considers alternative procedures; interprets procedural findings with assistance</i>	- Determines best route to perform liver biopsy in a patient with coagulopathy and/or ascites - Independently performs peri-procedural assessment for a liver biopsy - Independently performs peri-procedural assessment for patient undergoing therapeutic endoscopy performed by hepatology, and discusses possible alternatives to treatment, such as shunts - With assistance, interprets results of liver biopsy that are consistent with a specific disease process such as acute cellular rejection or autoimmune hepatitis
Level 4 <i>Independently interprets procedural findings and manages procedural complications</i>	- Identifies findings associated with variceal bleeding during endoscopy such as red wale sign - Identifies signs of post-liver biopsy complications such as intra-abdominal bleeding and appropriately initiates management in a timely manner - Independently interprets findings from paracentesis that are associated with chronic liver disease - Identifies biliary stricture in patient who has undergone endoscopic retrograde cholangiopancreatography (ERCP) or percutaneous transhepatic cholangiogram (PTC)
Level 5 <i>Serves as a role model for managing patients with comorbidities and procedural complications</i>	Teaches and supervises bleeding control strategies for patients with portal hypertension, including esophageal variceal banding or sclerotherapy
Assessment Models or Tools	- Case-based discussion - Direct observation - Medical record (chart) review - Self-assessment
Curriculum Mapping	
Notes or Resources	North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN). "Procedures Curriculum." https://naspghan.org/training-career-

[development/for-fellowship-directors/curricular-resources/procedures-curriculum/](#).
Accessed 2022.

- Rockey, Don C., Stephen H. Caldwell, Zachary D. Goodman, Rendon C. Nelson, and Alastair D. Smith. 2009. "Liver biopsy." *Hepatology* 49(3): 1017-1044.
<https://doi.org/10.1002/hep.22742>.

Patient Care 5: Pre-Transplant Hepatology Overall Intent: To identify, evaluate, and manage patients along with the multidisciplinary team before liver transplantation	
Milestones	Examples
Level 1 <i>Identifies patients who are eligible for liver transplant evaluation</i>	Identifies that a patient with biliary atresia and growth failure warrants a liver transplant evaluation
Level 2 <i>Evaluates patients using program selection criteria, with assistance</i>	- Identifies potential alternative therapies besides transplant such as dietary therapy or surgical shunts - Recognizes that a patient with active leukemia and subsequent liver failure is not a liver transplant candidate
Level 3 <i>Independently evaluates patients, including complexities of selection criteria</i>	- Recognizes that a patient with hepatopulmonary syndrome requires further evaluation and management prior to transplant listing - Demonstrates awareness of ethical considerations when evaluating and listing a patient for transplant
Level 4 <i>Independently determines eligibility for listing a patient for transplant; performs ongoing reassessment for continued eligibility</i>	- Determines the suitability of a patient for liver transplant and presents this assessment to the multidisciplinary team - Incorporates ethical considerations into listing decisions - Utilizes the current United Network for Organ Sharing (UNOS) allocation listing policies for liver transplantation - Is proficient in the process of writing and submitting non-standard exception requests
Level 5 <i>Optimizes selection of patients to meet the ethical responsibility to the patient, the program, and the community</i>	- Uses appropriate care settings and teams for patients with various profiles and stages of liver failure before transplantation - Incorporates risk-benefit analysis and cost considerations in diagnostic and treatment decisions, including the adoption of new technologies
Assessment Models or Tools	- Direct observation - End-of-rotation evaluations - Evaluation of conference presentations - Evaluation of transplant evaluation notes and exception letters
Curriculum Mapping	
Notes or Resources	Biggins, Scott W., Paulo Angeli, Guadalupe Garcia-Tsao, Pere Ginès, Simon C. Ling, Mitra K. Nadim, Florence Wong, and W. Ray Kim. 2021. "Diagnosis, Evaluation, and Management of Ascites, Spontaneous Bacterial Peritonitis and Hepatorenal Syndrome: 2021 Practice Guidance by the American Association for the Study of Liver Diseases." <i>Hepatology</i> Aug;74(2): 1014-1048. doi:10.1002/hep.31884.

- Leonis, Mike A., and William F. Balistreri. 2008. "Evaluation and Management of End-Stage Liver Disease in Children." *Gastroenterology* May;134(6): 1741-51. doi:10.1053/j.gastro.2008.02.029.
- Mouzaki, Marialena, Jiri Bronsky, Girish Gupte, Iva Hojsak, Jorg Jahnel, Nikhil Pai, Ruben E. Quiros-Tejeira, Renee Wieman, and Shikha Sundaram. 2019. "Nutrition Support of Children with Chronic Liver Diseases: A Joint Position Paper of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition." *Journal of Pediatric Gastroenterology and Nutrition* 2019 Oct;69(4): 498-511. doi:10.1097/MPG.0000000000002443.
- Squires, Robert H., Vicky Ng, Rene Romero, Udem Ekong, Winita Hardikar, Sukru Emre, and George V. Mazariegos. 2014. "Evaluation of the Pediatric Patient for Liver Transplantation: 2014 Practice Guideline by the American Association for the Study of Liver Diseases, American Society of Transplantation and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition." *Hepatology* 60(1): 362-398. DOI: 10.1002/hep.27191.

Patient Care 6: Peri-Operative and Post-Transplant Hepatology Overall Intent: To identify, evaluate, and manage patients along with the multidisciplinary team during and after liver transplantation	
Milestones	Examples
Level 1 <i>Uses institutional protocols to care for patients, including immunosuppression, acute and long-term monitoring</i>	• Is familiar with institutional protocol and recommends immunosuppression accordingly
Level 2 <i>Identifies and manages common acute and long-term complications, with assistance</i>	• Prescribes therapies to prevent opportunistic infections in liver transplant recipients • Recognizes that vascular thromboses, biliary complications, and bleeding are complications in the immediate post-transplant period • Identifies a patient with rising endobronchial valve (EBV) copies and considers lowering immunosuppression
Level 3 <i>Independently identifies and manages common complications, including complications of immunosuppression and comorbidities</i>	• With multidisciplinary team, evaluates post-transplant liver biopsies to diagnose acute cytomegalovirus (CMV) hepatitis and recommends treatment • Recognizes kidney injury as a complication of immunosuppression and determines strategies to mitigate this side effect
Level 4 <i>Independently identifies and manages complex complications, including deviations from institutional protocols</i>	• Collaborates with colleagues in interventional radiology and interventional endoscopy in the identification and management of biliary complications • Recognizes a patient with hypertension and altered mental status and takes next steps to diagnose and manage posterior reversible encephalopathy syndrome (PRES) • Identifies chronic kidney disease as a possible indication for non-protocol care post-transplant • Manages unique aspects of care for patients undergoing re-transplant
Level 5 <i>Manages the interdisciplinary team to formulate a care plan to achieve the best possible outcome</i>	• Collaboratively works with all members of the liver transplant team, including surgeons, other medical consultants, nurses, advanced practice providers, and ancillary staff members, managing conflicting opinions and facilitating optimal patient outcomes • Effectively uses an interdisciplinary approach to transition patients to adult care
Assessment Models or Tools	• Direct observation • End-of-rotation evaluations • Evaluation of conference presentations • Evaluation of transplant patient notes
Curriculum Mapping	•
Notes or Resources	• Grimaldi, Chiara, Marco Spada, and Giuseppe Maggiore. 2021. "Liver Transplantation in Children: An Overview of Organ Allocation and Surgical Management." <i>Current Pediatric Reviews</i> 17(4): 245-252. doi:10.2174/1573396317666210604111538. • Kelly, Deirdre A., John C. Bucuvalas, Estella M. Alonso, Saul J. Karpen, Upton Allen, Michael Green, Douglas Farmer, Eyal Shemesh, and Ruth A. McDonald; American

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| | <p>Association for the Study of Liver Diseases; American Society of Transplantation. 2013. "Long-term Medical Management of the Pediatric Patient after Liver Transplantation: 2013 Practice Guideline by the American Association for the Study of Liver Diseases and the American Society of Transplantation." <i>Liver Transplantation</i> Aug;19(8): 798-825. Doi: 10.1002/lt.23697. PMID: 23836431.</p> <ul style="list-style-type: none">● Miloh, Tamir, Andrea Barton, Justin Wheeler, Yen Pham, Winston Hewitt, Tara Keegan, Christine Sanchez, Pinar Bulut, and John Goss. 2017. "Immunosuppression in Pediatric Liver Transplant Recipients: Unique Aspects." <i>Liver Transplantation</i> Feb;23(2): 244-256. doi:10.1002/lt.24677. |
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Medical Knowledge 1: Clinical Knowledge of Pediatric Transplant Hepatology (Non-Procedural)	
Overall Intent: To acquire, possess, and demonstrate the facts, concepts, and ideas related to the field of transplant hepatology in order to provide patient care and communicate with other medical professionals	
Milestones	Examples
Level 1 <i>Demonstrates basic knowledge of liver disorders, including diagnostic, therapeutic/ pharmacologic categories for prevention and treatment of disease</i>	• Understands the signs and symptoms of biliary atresia • Knows the diagnostic criteria for acute liver failure • Lists indications for liver transplantation
Level 2 <i>Demonstrates expanding knowledge of liver disorders, including diagnostic, therapeutic/ pharmacologic options for prevention and treatment of disease</i>	• Describes the time-sensitive nature of biliary atresia and how delayed diagnosis/ management could impact outcomes • Knows the etiologies of acute liver failure • Understands technical variations in surgical approaches of transplant • Identifies appropriate antirejection medications based on medical comorbidities
Level 3 <i>Demonstrates broad knowledge of liver disorders, including diagnostic, therapeutic/ pharmacologic options for prevention and treatment of disease</i>	• Understands pathophysiology and presentation of biliary atresia, describes next steps in diagnosis, and recognizes poor biliary drainage post-Kasai • Lists age-appropriate workup for acute liver failure • Understands how donor characteristics influence post-operative complications
Level 4 <i>Synthesizes advanced knowledge of liver disorders to select diagnostic, therapeutic/ pharmacologic options for prevention and treatment of disease</i>	• Describes factors to consider when deciding between Kasai and primary transplant for a patient with biliary atresia • Knows the listing criteria for a patient with acute liver failure • Understands how aspects of the liver transplant surgery could influence post-operative complications
Level 5 <i>Demonstrates expert knowledge within a focused area</i>	• Discusses ongoing clinical trials for biliary atresia patients who are post-Kasai • Recommends expanding donor criteria to help mitigate wait list mortality • Stays up to date on past and current literature on management of acute-on-chronic liver failure
Assessment Models or Tools	• Case-based discussion • Direct observation
Curriculum Mapping	•
Notes or Resources	• American Association for the Study of Liver Disease. "Practice Guidelines." https://www.aasld.org/publications/practice-guidelines. Accessed 2019. • American Association for the Study of Liver Disease. "LiverLearning." https://liverlearning.aasld.org/. Accessed 2023. • American Board of Internal Medicine. "Transplant Hepatology." https://www.abim.org/~media/ABIM%20Public/Files/pdf/exam-blueprints/certification/transplant-hepatology.pdf. Updated January 2023.

- Hassan, Ammar, and Pratima Sharma. 2022. "CAQ Corner: Evolution of Liver Allocation Policy." *Liver Transplantation* 28(11): 1785-1795. doi:10.1002/lt.26497.
- Squires, Robert H., Benjamin L. Shneider, John Bucuvalas, Estella Alonso, Ronald J. Sokol, Michael R. Narkewicz, Anil Dhawan, et al. 2006. "Acute Liver Failure in Children: The First 348 Patients in the Pediatric Acute Liver Failure Study Group." *The Journal of Pediatrics* 148(5): 652-658.e2. doi:10.1016/j.jpeds.2005.12.051.
- Sundaram, Shikha S., Cara L. Mack, Amy G. Feldman, and Ronald J. Sokol. 2017. "Biliary Atresia: Indications and Timing of Liver Transplantation and Optimization of Pretransplant Care." *Liver Transplantation* 23(1): 96-109. doi:10.1002/lt.24640.

Medical Knowledge 2: Clinical Reasoning for Pediatric Transplant Hepatology Overall Intent: To provide specialty-specific care for patients with liver diseases and post-liver transplant	
Milestones	Examples
Level 1 <i>Creates a differential diagnosis and considers next steps in diagnostic evaluation</i>	- Needs assistance listing causes of elevated liver enzymes in a post-liver transplant patient - Develops a differential diagnosis for fever in a patient with cirrhosis
Level 2 <i>Creates a focused differential diagnosis and develops a diagnostic evaluation</i> <i>Maintains a fixed differential diagnosis despite new information</i>	- Lists most common causes of elevated liver enzymes in a post-liver transplant patient - Develops a focused differential diagnosis for fever in a patient with cirrhosis
Level 3 <i>Independently creates a prioritized differential diagnosis for a common patient presentation and develops a diagnostic evaluation</i> <i>Consistently incorporates new information to adjust differential diagnosis</i>	- Prioritizes post-transplant lymphoproliferative disorders (PTLD) in a post-transplant patient with fever, Epstein-Barr virus (EBV) viremia, and lymphadenopathy on exam and understands need for cross-sectional imaging - Adds drug-induced liver injury to the differential when a detailed history reveals recent use of herbal remedies
Level 4 <i>Independently creates a prioritized differential diagnosis for a less common patient presentation and develops a diagnostic evaluation</i> <i>Consistently evaluates and adjusts differential diagnosis integrating available new information and recognizes factors that lead to bias</i>	- Synthesizes history and physical and diagnostic testing in a patient admitted with acute-on-chronic liver failure - Does not anchor on acute rejection in a patient at risk for disease recurrence post-transplant
Level 5 <i>Recognizes rare presentations of common diagnoses and/or presentations of rare diagnoses and develops a diagnostic evaluation</i> <i>Is aware of cognitive biases and demonstrates behaviors to overcome them</i>	- Recognizes that new onset of an erythematous maculopapular rash in a post-transplant patient raises graft-versus-host disease (GVHD) as a likely etiology - Identifies potential toward anchoring bias and leads multidisciplinary conference to obtain input
Assessment Models or Tools	- Conference participation - Direct observation - Formative evaluation - Summative evaluation

Curriculum Mapping	•
Notes or Resources	• American Association for the Study of Liver Disease. "Practice Guidelines." https://www.aasld.org/publications/practice-guidelines. Accessed 2019. • American College of Gastroenterology. "ACG Education Universe." http://universe.gi.org/. Accessed 2019. • American College of Gastroenterology. "ACG Guidelines." https://gi.org/tag/acg-guidelines/. Accessed 2019. • American College of Gastroenterology. "The Gastroenterology Core Curriculum." https://webfiles.gi.org/docs/fellows-GICoreCurriculum.pdf. Accessed 2019. • American Society for Gastrointestinal Endoscopy. "GESAP-Self Assessment." https://www.asge.org/quicklinks/gesap. Accessed 2019. • The Society to Improve Diagnosis in Medicine. "Assessment of Reasoning Tool." https://www.improvediagnosis.org/art/. Accessed 2019. • The Society to Improve Diagnosis in Medicine. "Inter-Professional Consensus Curriculum on Diagnosis and Diagnostic Error. Driver Diagram." https://www.improvediagnosis.org/wp-content/uploads/2018/10/Driver_Diagram_-_July_31_-_M.pdf. Accessed 2019.

Systems-Based Practice 1: Patient Safety	
Overall Intent: To engage in the analysis and management of patient safety events, including relevant communication with patients, their families, and health care professionals	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of common patient safety events</i> <i>Demonstrates knowledge of how to report patient safety events</i>	• Lists common patient safety events such as delayed timing of immunosuppression for liver transplant recipients • Recognizes “patient safety reporting system” or “patient safety hotline” as ways to report safety events
Level 2 <i>Identifies system factors that lead to patient safety events</i> <i>Reports patient safety events through institutional reporting systems (simulated or actual)</i>	• Identifies that electronic health record (EHR) default timing of orders as “routine” (without changing to “stat”) may lead to delays in medication administration time • Identifies that medication formulation and dosing may cause confusion and lead to the incorrect dosing administration • Reports delayed antibiotic administration time using the appropriate reporting mechanism
Level 3 <i>Participates in analysis of patient safety events (simulated or actual)</i> <i>Participates in disclosure of patient safety events to patients and families (simulated or actual)</i>	• Participates in department morbidity and mortality presentations • Participates in a quality improvement project aimed at patient safety • With the support of an attending or risk management team member, participates in the disclosure of a procedural complication to a patient’s family
Level 4 <i>Conducts analysis of patient safety events and offers error prevention strategies (simulated or actual)</i> <i>Discloses patient safety events to patients and families (simulated or actual)</i>	• Participates in a simulated or actual root cause analysis related to an adverse event in a patient who is pre-or post-liver transplant • Recognizes biases among team members as a patient safety issue • Following consultation with risk management and other team members, independently discloses a procedural complication to a patient’s family
Level 5 <i>Actively engages teams and processes to modify systems to prevent patient safety events</i> <i>Role models or mentors others in the disclosure of patient safety events</i>	• Develops a team-based process to prevent discharge errors • Establishes a program to ensure adequate transportation for patients who must return for additional procedures • Conducts a simulation demonstrating techniques and approaches for disclosing patient safety events • Mentors a resident or fellow through the disclosure of patient safety events
Assessment Models or Tools	• Case-based discussion

	• Direct observation • Medical record (chart) review
Curriculum Mapping	•
Notes or Resources	• Guralnick, Susan, Stephen Ludwig, and Robert Englander. 2014. "Domain of Competence: Systems-Based Practice." <i>Academic Pediatrics</i> 14: S70-S79. doi: 10.1016/j.acap.2013.11.015. • Kruszewski, Brennan D., and Nathan O. Spell III. 2018. "A Consensus Approach to Identify Tiered Competencies in Quality Improvement and Patient Safety." <i>Journal of Graduate Medical Education</i> 10(6): 646-650. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6314353/. • Shah, Brijen J. 2019. "How to Deliver Safer and Effective Patient Care: Tips for Team Leaders and Educators." <i>Gastroenterology</i> 156(4): 852-855. https://www.gastrojournal.org/article/S0016-5085(19)30390-7/fulltext?referrer=https%3A%2F%2Fwww.ncbi.nlm.nih.gov%2F. • Siddique, Shazia Mehmood, Gyanprakash Ketwaroo, Carolyn Newberry, Simon Mathews, Vandana Khungar, and Shivan J. Mehta. 2018. "How to Incorporate Quality Improvement and Patient Safety Projects in Your Training." <i>Gastroenterology</i> 154(6): 1564-1568. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5931739/. • Singh, Ranjit, Bruce Naughton, John S. Taylor, Marlon R. Koenigsberg, Diana R. Anderson, Linda L. McCausland, Robert G. Wahler, Amanda Robinson, and Gurdev Singh. 2005. "A Comprehensive Collaborative Patient Safety Residency Curriculum to Address the ACGME Core Competencies." <i>Medical Education</i> 39(12): 1195-204. https://pubmed.ncbi.nlm.nih.gov/16313578/.

Systems-Based Practice 2: Quality Improvement Overall Intent: To understand and implement quality improvement methodologies to improve patient care	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of basic quality improvement methodologies and metrics</i>	• Describes fishbone diagram • Describes components of a “Plan-Do-Study-Act” cycle
Level 2 <i>Describes local quality improvement initiatives (e.g., community vaccination rate, infection rate, smoking cessation)</i>	• Describes clinic initiatives to improve immunosuppression compliance among transplant recipients • Describes an initiative to improve patient vaccination rates
Level 3 <i>Participates in local quality improvement initiatives</i>	• Participates in an ongoing interdisciplinary project to improve medication reconciliation • Collaborates on a project to improve inpatient discharge instructions for immunosuppression after liver transplantation with the pharmacy team
Level 4 <i>Demonstrates the skills required to identify, develop, implement, and analyze a quality improvement project</i>	• Develops and implements a quality improvement project to optimize transition to adult liver transplant program • In developing a quality improvement project, considers team bias and social determinants of health in patient populations
Level 5 <i>Creates, implements, and assesses quality improvement initiatives at the institutional or community level</i>	• Becomes the center lead for a national multicenter quality improvement initiative on vaccinations for liver transplant recipients and shares results through a formal presentation
Assessment Models or Tools	• Direct observation • Poster or other presentation evaluation • Publication
Curriculum Mapping	•
Notes or Resources	• Guralnick, Susan, Stephen Ludwig, and Robert Englander. 2014. “Domain of Competence: Systems-Based Practice.” <i>Academic Pediatrics</i> 14: S70-S79. doi: 10.1016/j.acap.2013.11.015. • Kruszewski, Brennan D., and Nathan O. Spell III. 2018. “A Consensus Approach to Identify Tiered Competencies in Quality Improvement and Patient Safety.” <i>Journal of Graduate Medical Education</i> 10(6): 646-650. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6314353/. • Murtagh Kurowski, Eileen, Amanda C. Schondelmeyer, Courtney Brown, Christopher E. Dandoy, Samuel J. Hanke, and Heather L. Tubbs Cooley. 2015. “A Practical Guide to Conducting Quality Improvement in the Health Care Setting.” <i>Current Treatment Options in Pediatrics</i> 1: 380-392. https://link.springer.com/article/10.1007%2Fs40746-015-0027-3. • Shah, Brijen J. 2019. “How to Deliver Safer and Effective Patient Care: Tips for Team Leaders and Educators.” <i>Gastroenterology</i> 156(4): 852-855.

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Systems-Based Practice 3: System Navigation for Patient-Centered Care – Coordination of Care Overall Intent: To effectively navigate the health care system, including the interdisciplinary team and other care practitioners; to adapt care to a specific patient population to ensure high-quality patient outcomes	
Milestones	Examples
Level 1 <i>Lists the various interprofessional individuals involved in the patient's care coordination</i>	- Identifies the team members necessary to care for a patient with liver disease - Identifies access to care and insurance coverage as social determinants of health
Level 2 <i>Coordinates care of patients in routine clinical situations, incorporating interprofessional teams with consideration of patient and family needs</i>	- Coordinates home health and subspecialty care for a child with Alagille syndrome - Coordinates with outpatient dietician for a child with biliary atresia requiring supplemental tube feeds
Level 3 <i>Coordinates care of patients in complex clinical situations, effectively utilizing the roles of interprofessional teams, and incorporating patient and family needs and goals</i>	- Works with pharmacy and case management to ensure that patients have access to medications - Recognizes that marginalized communities may have additional barriers to access and the need to involve a social worker in finding community resources
Level 4 <i>Coordinates interprofessional, patient-centered care among different disciplines and specialties, actively assisting families in navigating the health care system</i>	- During inpatient rotations, arranges a multidisciplinary meeting and leads team members in a complex case discussion - Advocates for rescheduling a patient who missed several subspecialty appointments due to socioeconomic barriers and helps to arrange transportation
Level 5 <i>Coaches others in interprofessional, patient-centered care coordination</i>	- Leads an initiative to educate team members about home health services or medical home model for medically complex children, including discussion of health care disparities - Coaches and mentors other learners in how to run a multidisciplinary team meeting for a child with complex health care needs
Assessment Models or Tools	- Direct observation - Medical record (chart) audit - Multisource feedback/clinical observations - Review of discharge planning documentation
Curriculum Mapping	
Notes or Resources	- The published literature has many examples of descriptive studies, and results of interventions focus on hand-offs and care transitions within hepatology and inflammatory bowel disease. These papers can serve as tools for journal club or to guide the development of a quality improvement project. - American Academy of Pediatrics (AAP). https://www.aap.org/en-us/Pages/Default.aspx. Accessed 2020. - The American Board of Pediatrics. "Entrustable Professional Activities for General Pediatrics." https://www.abp.org/entrustable-professional-activities-epas. Accessed 2020.

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Systems-Based Practice 4: System Navigation for Patient-Centered Care – Transitions in Care Overall Intent: To effectively navigate the health care delivery system during transitions of care to ensure high-quality patient outcomes	
Milestones	Examples
Level 1 <i>Uses a standard template for transitions of care/hand-offs</i>	When handing off to colleagues for a weekend, reads verbatim from a templated hand-off but lacks context
Level 2 <i>Adapts a standard template, recognizing key elements for safe and effective transitions of care/hand-offs in routine clinical situations</i>	- Routinely uses a standardized hand-off for a stable patient, verbalizes a basic understanding of active problems, and provides basic contingency plans - Discusses a patient who will need follow up in liver clinic with nurse coordination and determines timing of next labs
Level 3 <i>Performs safe and effective transitions of care/hand-offs in complex clinical situations, and ensures closed-loop communication</i>	- Routinely uses a standardized hand-off when transferring a patient to the intensive care unit, with direct communication of clinical reasoning - Performs the hand-off for a liver transplant recipient with a succinct summary by problem or system, a timeline for outpatient follow-up, with clearly delineated responsibilities
Level 4 <i>Performs and advocates for safe and effective transitions of care/hand-offs within and across health care delivery systems, including transitions to adult care</i>	- Prior to going on vacation, proactively seeks out colleagues to follow-up test results that are still pending with specific instructions and contingency plans for the follow-up visit with the patient/family - Ensures a thorough hand-off, including the patient's cultural preferences and social needs, to the identified new adult practitioners
Level 5 <i>Coaches others in improving transitions of care within and across health care delivery systems to optimize patient outcomes</i>	Develops and implements a process for team members to follow when transitioning liver transplant recipients to adult transplant centers
Assessment Models or Tools	- Direct observation - Clinical evaluations - Review of sign-out tools, use and review of checklists - Standardized hand-off checklist
Curriculum Mapping	
Notes or Resources	- The American Board of Pediatrics. "Entrustable Professional Activities for General Pediatrics." https://www.abp.org/entrustable-professional-activities-epas. Accessed 2020. - GotTransition. "Clinician Education and Resources." https://www.gottransition.org/resources-and-research/clinician-education-resources.cfm. Accessed 2020. - Matern, Lukas H., Jeanne M. Farnan, Kristen W. Hirsch, Melissa Cappaert, Ellen S. Byrne, and Vineet M. Arora. 2018. "A Standardized Handoff Simulation Promotes Recovery from Auditory Distractions in Resident Physicians." <i>Simulation in Healthcare</i> 13(4): 233-238. https://insights.ovid.com/crossref?an=01266021-201808000-00003.

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- Starmer, Amy J., Nancy D. Spector, Rajendu Srivastava, April D. Allen, Christopher P. Landrigan, Theodore C. Sectish, and the I-PASS Study Group. 2012. "I-Pass, A Mnemonic to Standardize Verbal Handoffs." *Pediatrics* 129(2): 201–204. <https://doi.org/10.1542/peds.2011-2966>.

Systems-Based Practice 5: Population and Community Health Overall Intent: To promote and improve health across communities and populations through patient care and advocacy, including public education and elimination of structural racism	
Milestones	Examples
Level 1 <i>Demonstrates awareness of population and community health needs and disparities</i>	- Identifies that social issues and trauma can impact children with liver disease - Identifies and helps navigate socioeconomic barriers in the treatment of a child with hepatitis C
Level 2 <i>Identifies specific population and community health needs and disparities; identifies local resources</i>	Discusses the impact of race and place of residence on outcomes for children with liver disease
Level 3 <i>Uses local resources effectively to meet the needs and reduce health disparities of a patient population and community</i>	Connects patients who have limited English language proficiency with community health care workers who can guide the patient through the medical system
Level 4 <i>Adapts practice to provide for the needs of and reduce health disparities of a specific population</i>	- Participates in an advocacy project to improve telehealth access for patients who reside in rural areas - Creates a process to identify patient mental health issues and refer to appropriate services - Advocates for exception points, and the use of living donors in children belonging to racial minorities
Level 5 <i>Advocates at the local, regional, or national level for populations and communities with health care disparities</i>	Participates in the public comment process for upcoming changes in pediatric liver allocation during regional UNOS meetings
Assessment Models or Tools	- Case presentations - Direct observation - Multisource feedback
Curriculum Mapping	
Notes or Resources	- AAP. "Advocacy." https://services.aap.org/en/advocacy/. Accessed 2020. - The American Board of Pediatrics. "Entrustable Professional Activities for General Pediatrics." https://www.abp.org/entrustable-professional-activities-epas. Accessed 2020. - Blankenburg, Rebecca, Patricia Poitevien, Javier Gonzalez del Rey, Megan Aylor, John Frohna, Heather McPhillips, Linda Waggoner-Fountain, and Laura Degnon. 2020. "Dismantling Racism: Association of Pediatric Program Directors' Commitment to Action." <i>Academic Pediatrics</i> 20(8): 1051-1053. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7450251/. - Centers for Disease Control and Prevention. "Fast Facts: Preventing Adverse Childhood Experiences." https://www.cdc.gov/violenceprevention/aces/fastfact.html?CDC_AA_refVal=https%3A%2

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Systems-Based Practice 6: Physician Role in Health Care Systems Overall Intent: To understand the physician's role in health systems science to optimize patient care delivery, including cost-conscious care	
Milestones	Examples
Level 1 <i>Engages with patients and other providers in discussions about cost-conscious care and key components of the health care delivery system</i>	• Considers the differences in cost burden for a patient in the hospital versus being closely followed as an outpatient
Level 2 <i>Identifies the relationships between the delivery system and cost-conscious care and the impact on the patient care</i>	• Considers cost when ordering lab evaluation for an adolescent with isolated indirect hyperbilirubinemia • Ensures that a patient hospitalized with a new diagnosis has outpatient laboratory orders and scheduled outpatient follow-up appointment at the time of discharge
Level 3 <i>Discusses the need for changes in clinical approaches based on evidence, outcomes, and cost-effectiveness to improve care for patients and families</i>	• Discusses pros and cons of endoscopic variceal screening as a tool for primary prophylaxis in patient with portal hypertension • Adapts plan to minimize costs and provides appropriate care for an uninsured patient
Level 4 <i>Advocates for the promotion of safe, quality, and high-value care</i>	• Develops an action plan for discharging children with cirrhosis to minimize hospital readmissions • Creates a checklist of labs and imaging tests for infants with cholestasis
Level 5 <i>Coaches others to promote safe, quality, and high-value care across health care systems</i>	• Educates community pediatricians and neonatologists about updates on newborn screening and early detection of biliary atresia, and institutes a streamlined referral process for timely evaluation of an infant with cholestasis
Assessment Models or Tools	• Direct observation • Multisource feedback
Curriculum Mapping	•
Notes and Resources	• AHRQ. "Major Physician Performance Sets." https://www.ahrq.gov/professionals/quality-patient-safety/talkingquality/create/physician/measurementsets.html. Accessed 2019. • American Board of Internal Medicine. "QI/PI Activities." https://www.abim.org/maintenance-of-certification/earning-points/qi-pi-activities.aspx. Accessed 2020. • American College of Physicians. "Newly Revised: Curriculum for Educators and Residents (Version 4.0)." https://www.acponline.org/clinical-information/high-value-care/medical-educators-resources/newly-revised-curriculum-for-educators-and-residents-version-40. Accessed 2020. • The Commonwealth Fund. "State Health Data Center." http://datacenter.commonwealthfund.org/?_ga=2.110888517.1505146611.1495417431-1811932185.1495417431#ind=1/sc=1. Accessed 2019.

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- The Kaiser Family Foundation. "Topic: Health Reform." <https://www.kff.org/topic/health-reform/>. Accessed 2019.
- Palermo, Joseph J., Shannon Joerger, Yumirle Turmelle, Peter Putnam, and Jane Garbutt. 2012. "Neonatal Cholestasis: Opportunities to Increase Early Detection." *Academic Pediatrics* Jul-Aug;12(4): 283-7. doi:10.1016/j.acap.2012.03.021.

Practice-Based Learning and Improvement 1: Evidence-Based and Informed Practice	
Overall Intent: To practice evidence-based medicine that is tailored to the specific needs of individual patients and patient populations	
Milestones	Examples
Level 1 <i>Develops an answerable clinical question and demonstrates how to access available evidence, with guidance</i>	Identifies a question such as, “How do you manage patients with acute liver failure?” but needs guidance to focus it into a searchable question
Level 2 <i>Independently articulates clinical question and accesses available evidence</i>	Formulates a focused, answerable question and appropriately searches the medical literature to answer a clinical question
Level 3 <i>Locates and applies the evidence, integrated with patient preference, to the care of patients</i>	Uses the most current literature for the management of children with liver disease and transplant-related issues
Level 4 <i>Critically appraises and applies evidence, even in the face of uncertainty and conflicting evidence to guide care tailored to the individual patient</i>	- Recognizes center variability in the management of post-transplant patients and lack of standard of care for some liver and transplant-related issues and tailors management depending on patient’s unique characteristics - Demonstrates ability to critically appraise literature
Level 5 <i>Coaches others to critically appraise and apply evidence for complex patients</i>	- Participates in the development of clinical guidelines on a national committee - Role models and coaches others in creating efficient and effective search strategies to answer clinical questions
Assessment Models or Tools	- Direct observation - Presentation evaluation - Scholarly project
Curriculum Mapping	
Notes or Resources	- Camilleri, Michael, and David A. Katzka. 2016. “Enhancing High Value Care in Gastroenterology Practice.” <i>Clinical Gastroenterology and Hepatology</i> 14(10): 1376-1384. https://www.cghjournal.org/article/S1542-3565(16)30211-7/fulltext. - Djulbegovic, Benjamin, and Gordon H. Guyatt. 2017. “Progress in Evidence-Based Medicine: A Quarter Century On.” <i>Lancet</i> 390(10092): 415-423. doi: 10.1016/S0140-6736(16)31592-6. Epub 2017 Feb 17. PMID: 28215660. - Duke University. “Evidence-Based Practice.” https://guides.mclibrary.duke.edu/ebm/home. Accessed 2020. - Guyatt, Gordon, Drummond Rennie, Maureen O. Meade, and Deborah Cook. 2015. <i>Users’ Guides to the Medical Literature: A Manual for Evidence-Based Clinical Practice</i>, 3rd ed. USA: McGraw-Hill Education. https://jamaevidence.mhmedical.com/Book.aspx?bookId=847. Accessed 2020.

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https://www.nlm.nih.gov/bsd/disted/pubmedtutorial/cover.html. Accessed 2020. |
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Practice-Based Learning and Improvement 2: Reflective Practice and Commitment to Personal Growth Overall Intent: To continuously improve patient care based on self-evaluation and lifelong learning	
Milestones	Examples
Level 1 <i>Participates in feedback sessions</i> <i>Develops personal and professional goals, with assistance</i>	• Attends scheduled feedback sessions • Sets a goal to improve clinical and procedural skills
Level 2 <i>Demonstrates openness to feedback and performance data</i> <i>Designs a learning plan based on established goals, feedback, and performance data, with assistance</i>	• Acknowledges concerns about timely note completion and works with clinic preceptor to develop goals for improvement • Develops a plan to explore own biases and how they impact patient care
Level 3 <i>Seeks and incorporates feedback and performance data episodically</i> <i>Designs and implements a learning plan by analyzing and reflecting on the factors which contribute to gap(s) between performance expectations and actual performance</i>	• Acknowledges feedback received while performing procedures and arranges ways to increase exposure • Recognizes lack of exposure to certain disease processes and works with supervisor to identify patients with such conditions coming to clinic
Level 4 <i>Seeks and incorporates feedback and performance data consistently</i> <i>Adapts a learning plan using long-term professional goals, self-reflection, and performance data to measure its effectiveness</i>	• Actively seeks feedback in areas and changes practices • Develops a lecture based on gaps of knowledge that have been self-identified
Level 5 <i>Role models and coaches others in seeking and incorporating feedback and performance data</i> <i>Demonstrates continuous self-reflection and coaching of others on reflective practice</i>	• Helps a junior learner schedule reoccurring time to discuss feedback with a supervisor • Provides career mentoring to learners to review clinical practice goals and academic aspirations • Guides other learners and team members in reflecting on their own implicit biases
Assessment Models or Tools	• Direct observation • Multisource feedback • Review of learning plan

Curriculum Mapping	•
Notes or Resources	• Burke, Anne E., Bradley Benson, Robert Englander, Carol Carraccio, and Patricia J. Hicks. 2014. "Domain of Competence: Practice-Based Learning and Improvement." <i>Academic Pediatrics</i>. 14(2): S38-S54. DOI: https://doi.org/10.1016/j.acap.2013.11.018. • Hojat, Mohammadreza, J. Jon Veloski, and Joseph S. Gonnella. 2009. "Measurement and Correlates of Physicians' Lifelong Learning." <i>Academic Medicine</i>. 84(8): 1066-74. https://journals.lww.com/academicmedicine/fulltext/2009/08000/Measurement_and_Correlates_of_Physicians_Lifelong.21.aspx. • Lockspeiser, Tai M., Patricia A. Schmitter, J. Lindsey Lane, Janice L. Hanson, Adam A. Rosenberg, and Yoon Soo Park. 2013. "Assessing Residents' Written Learning Goals and Goal Writing Skill: Validity Evidence for the Learning Goal Scoring Rubric." <i>Academic Medicine</i>. 88(10):1558-1563. DOI: 10.1097/ACM.0b013e3182a352e6. • Marrero, Jorge A., Laura M. Kulik, Claude B. Sirlin, Andrew X. Zhu, Richard S. Finn, Michael M. Abecassis, Lewis R. Roberts, and Julie K. Heimbach. 2018. "Diagnosis, Staging, and Management of Hepatocellular Carcinoma: 2018 Practice Guidance by the American Association for the Study of Liver Diseases." <i>Hepatology</i> 68(2): 723-750. https://aasldpubs.onlinelibrary.wiley.com/doi/full/10.1002/hep.29913.

Professionalism 1: Professional Behavior	
Overall Intent: To demonstrate ethical and professional behaviors, promote these behaviors in others, and use appropriate resources to manage professional dilemmas	
Milestones	Examples
Level 1 <i>Identifies expected professional behaviors and potential triggers for lapses</i> <i>Identifies the value and role of pediatric transplant hepatology as a vocation/career</i>	• Identifies fatigue as a trigger for lapses in professionalism • Acknowledges the importance of the pediatric transplant hepatologist in providing accurate, timely information to services requesting consultation
Level 2 <i>Demonstrates professional behavior with occasional lapses</i> <i>Demonstrates accountability for patient care as a pediatric transplant hepatologist, with guidance</i>	• After appearing late for own presentation at morning conference, identifies this lapse, and immediately apologizes to peers and attendings upon arrival • Asks attending for help in telling a patient and patient's family about delayed report of a biopsy result
Level 3 <i>Maintains professional behavior in increasingly complex or stressful situations</i> <i>Fully engages in patient care and holds oneself accountable</i>	• Advocates for an individual patient's needs in a humanistic and professional manner despite aggressive parental demands • Ensure timely follow-up on biopsy results without prompting on an intensive care unit patient
Level 4 <i>Recognizes situations that may trigger professionalism lapses and intervenes to prevent lapses in self and others</i> <i>Exhibits a sense of duty to patient care and professional responsibilities</i>	• Provides feedback to residents who are speaking inappropriately about a patient scenario • Volunteers to assist colleagues with seeing patients when the clinic or inpatient service is busier than normal
Level 5 <i>Models professional behavior and coaches others when their behavior fails to meet professional expectations</i> <i>Extends the role of the pediatric transplant hepatologist beyond the care of patients by engaging with the community, specialty, and medical profession as a whole</i>	• Mentors colleagues regarding handling difficult patient scenarios • Serves on the board of a patient advocacy group as a medical consultant
Assessment Models or Tools	• Direct observation • Multisource feedback • Oral or written self-reflection

Curriculum Mapping	•
Notes or Resources	• AbdelHameid, Duaa. 2020. "Professionalism 101 for Black Physicians." <i>New England Journal of Medicine</i>. 383(5): e34. doi:10.1056/NEJMp2022773. • Aeder, Lita, Lisa Altshuler, Elizabeth Kachur, and Ingrid Walker-Descartes. 2018. "Empowering Trainees to Promote Professionalism." <i>Clinical Teacher</i> 15(4): 304-308. doi: 10.1111/tct.12680. Epub 2017 Jun 14. PMID: 28612510. • American Medical Association "Ethics." https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. Accessed 2019. • American Board of Internal Medicine. 2002. "Medical Professionalism in the New Millennium: A Physician Charter." <i>Annals of Internal Medicine</i> 136: 243-246. http://abimfoundation.org/wp-content/uploads/2015/12/Medical-Professionalism-in-the-New-Millennium-A-Physician-Charter.pdf. • American Board of Pediatrics. "Medical Professionalism." https://www.abp.org/content/medical-professionalism. Accessed 2020. • American Academy of Pediatrics. "Residency Curriculum: Mental Health Education Resources." https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Mental-Health/Pages/Residency-Curriculum.aspx. Accessed 2020. • American Board of Pediatrics. "Teaching, Promoting, and Assessing Professionalism Across the Continuum: A Medical Educator's Guide." https://www.abp.org/professionalism-guide. Accessed 2020. • Berger, Arielle S., Elizabeth Niedra, Stephanie G. Brooks, Waleed S. Ahmed, and Shiphra Ginsburg. 2020. "Teaching Professionalism in Postgraduate Medical Education: A Systematic Review." <i>Academic Medicine</i> 95(6): 938-946. doi: 10.1097/ACM.0000000000002987. PMID: 31517687. • Bynny, Richard L., Douglas S. Paauw, Maxine Papadakis, and Sheryl Pfeil. 2017. <i>Medical Professionalism Best Practices: Professionalism in the Modern Era</i>. Menlo Park, CA: Alpha Omega Alpha Medical Society. https://www.alphaomegalpha.org/wp-content/uploads/2022/01/Monograph2018.pdf. ISBN: 978-1-5323-6516-4. • Domen, Ronald E., Kristen Johnson, Richard Michael Conran, Robert D. Hoffman, Miriam D. Post, Jacob J. Steinberg, Mark D. Brissette, et al. 2017. "Professionalism in Pathology: A Case-Based Approach as a Potential Education Tool." <i>Archives of Pathology and Laboratory Medicine</i> 141(2): 215-219. doi:10.5858/arpa.2016-0217-CP. • Levinson, Wendy, Shiphra Ginsburg, Frederic W. Hafferty, and Catherine R. Lucey. 2014. <i>Understanding Medical Professionalism</i>. New York, NY: McGraw-Hill Education. https://accessmedicine.mhmedical.com/book.aspx?bookID=1058. • Osseo-Asare, Aba, Lilanthi Balasuriya, Stephen J. Huot, et al. 2018. "Minority Resident Physicians' Views on the Role of Race/Ethnicity in Their Training Experiences in the

Workplace.” *JAMA Network Open*. 1(5): e182723.
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<https://www.nejm.org/doi/full/10.1056/NEJMp2021812>.

Professionalism 2: Ethical Principles	
Overall Intent: To recognize and address common and complex ethical dilemmas	
Milestones	Examples
Level 1 <i>Demonstrates knowledge of the ethical principles underlying informed consent, surrogate decision making, advance directives, confidentiality, error disclosure, stewardship of limited resources, and related topics</i>	• Recognizes need to contact a social worker in anticipation of performing a procedure on a patient who is in state custody • Asks about resources for acknowledging an error on the inpatient service
Level 2 <i>Applies ethical principles in common situations</i>	• Discusses with attending next steps in disclosure of a positive pregnancy test in a posttransplant adolescent
Level 3 <i>Analyzes complex situations using ethical principles to address conflict/controversy; seeks help when needed to manage and resolve complex ethical situations</i>	• Considers treatment options for a patient in acute liver failure who also has seizures and developmental delay
Level 4 <i>Manages and seeks to resolve ethical dilemmas using appropriate resources (e.g., ethics consultations, literature review, risk management/legal consultation)</i>	• Appropriately uses ethics resources to discuss end-of-life care of a child in the intensive care unit on the liver transplant waitlist whose clinical status is deteriorating
Level 5 <i>Called upon by others to consult in cases of complex ethical dilemmas; identifies and seeks to address system-level factors that induce or exacerbate</i>	• Leads discussion at an ethics consult for a patient with liver failure whose parents have declined transplant evaluation
Assessment Models or Tools	• Direct observation • Multisource feedback • Oral or written self-reflection
Curriculum Mapping	•
Notes or Resources	• American Medical Association. "Ethics." https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. Accessed 2020. • American Board of Internal Medicine, ACP-ASIM Foundation, European Federation of Internal Medicine. 2002. "Medical Professionalism in the New Millennium: A Physician Charter." <i>Annals of Internal Medicine</i> 136: 243-246. http://abimfoundation.org/wp-content/uploads/2015/12/Medical-Professionalism-in-the-New-Millennium-A-Physician-Charter.pdf. Accessed 2020. • Bynny, Richard L., Douglas S. Paaauw, Maxine Papadakis, and Sheryl Pfeil. 2017. <i>Medical Professionalism Best Practices: Professionalism in the Modern Era</i>. Menlo Park, CA:

Alpha Omega Alpha Medical Society. <https://www.alphaomegaalpha.org/wp-content/uploads/2022/01/Monograph2018.pdf>. ISBN: 978-1-5323-6516-4.

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Professionalism 3: Accountability/Conscientiousness Overall Intent: To take responsibility for one's own actions and their impact on patients and other members of the health care team	
Milestones	Examples
Level 1 <i>Performs tasks and responsibilities, with prompting</i>	• Responds to reminders from program administrator to complete work hour logs
Level 2 <i>Performs tasks and responsibilities in a timely manner in routine situations</i>	• Completes administrative tasks by specified due date • Completes basic tasks in anticipation of inability to access computer while traveling
Level 3 <i>Performs tasks and responsibilities in a thorough and timely manner in complex or stressful situations</i>	• Identifies multiple competing demands when caring for patients, appropriately triages tasks, and appropriately seeks help from other team members
Level 4 <i>Coaches others to ensure tasks and responsibilities are completed in a thorough and timely manner in complex or stressful situations</i>	• Coaches junior fellows on taking responsibility for incomplete communication during sign-out
Level 5 <i>Creates strategies to enhance others' ability to efficiently complete tasks and responsibilities</i>	• Organizes a multidisciplinary team meeting in order to develop an improved process for discharging patients with complex medical care needs
Assessment Models or Tools	• Compliance with deadlines and timelines • Direct observation • Multisource feedback • Self-evaluations and reflective tools • Simulation
Curriculum Mapping	•
Notes or Resources	• Institution/GME code of ethics • Code of conduct from fellow/resident institutional manual • Expectations of fellowship program regarding accountability and professionalism • The American Board of Pediatrics. "Entrustable Professional Activities for General Pediatrics." https://www.abp.org/entrustable-professional-activities-epas. Accessed 2020. • American Medical Association. "Ethics." https://www.ama-assn.org/delivering-care/ama-code-medical-ethics. Accessed 2020.

Professionalism 4: Well-Being	
Overall Intent: To identify resources to manage and improve well-being	
Milestones	Examples
Level 1 <i>Recognizes the importance of addressing personal and professional well-being</i>	Recognizes that personal stress may require a change in schedule
Level 2 <i>Describes institutional resources that are meant to promote well-being</i>	Identifies well-being resources such as meditation apps and mental health resources for students, residents, and fellows available through the program and institution
Level 3 <i>Recognizes institutional and personal factors that impact well-being</i>	Prioritizes a set of activities that bring joy and personal fulfillment and emphasizes these activities in times of need
Level 4 <i>Describes interactions between institutional and personal factors that impact well-being</i>	Discusses a plan to mitigate the tension between a busy schedule and time with family
Level 5 <i>Coaches and supports colleagues to optimize well-being at the team, program, or institutional level</i>	Leads organizational efforts to address clinician well-being
Assessment Models or Tools	- Direct observation - Group interview or debrief - Individual interview - Institutional online training modules - Self-assessment and personal learning plan
Curriculum Mapping	
Notes or Resources	- This subcompetency is not intended to evaluate a fellow's well-being, 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. - Local resources, including employee assistance and employee/student health services - Hicks, Patricia J., Daniel Schumacher, Susan Guralnick, Carol Carraccio, and Ann E. Burke. 2014. "Domain of Competence: Personal and Professional Development." <i>Academic Pediatrics</i>. 14(2 Suppl): S80-97. https://doi.org/10.1016/j.acap.2013.11.017. - ACGME. "Well-Being." https://dl.acgme.org/pages/well-being-tools-resources. 2023.

Interpersonal and Communication Skills 1: Patient- and Family-Centered Communication Overall Intent: To establish a therapeutic relationship with patients and their families, tailor communication to the needs of patients and their families, and effectively navigate difficult/sensitive conversations	
Milestones	Examples
Level 1 <i>Demonstrates respect and attempts to establish rapport</i> <i>Attempts to adjust communication strategies based upon patient/family expectations</i>	- Introduces self and faculty member, identifies patient and others in the room, and engages all appropriate parties in health care discussion - Identifies need for trained interpreter for patients with limited English proficiency or hearing impairment, with prompting
Level 2 <i>Establishes a therapeutic relationship in straightforward encounters</i> <i>Adjusts communication strategies as needed to mitigate barriers and meet patient/family expectations</i>	- Listens to concerns of patient's parents at the beginning of a visit with a child with acute-on-chronic liver disease - When seeing a distraught teenager with liver disease, adjusts communication strategies to meet patient/family needs
Level 3 <i>Establishes a culturally competent and therapeutic relationship in most encounters</i> <i>Communicates with sensitivity and compassion, elicits patient/family values, and acknowledges uncertainty and conflict</i>	- Addresses patient's family's health beliefs when caring for a child with liver disease - Recognizes importance of correctly pronouncing a patient's name; apologizes to the patient and seeks to correct mistakes if made
Level 4 <i>Establishes a therapeutic relationship in straightforward and complex encounters, including those with ambiguity and/or conflict</i> <i>Uses shared decision making with patient/family to make a personalized care plan</i>	- Continues to engage patients' parents who refuse transplant evaluation for a child, addressing misinformation and reviewing risks/benefits to assuage these concerns in a manner that engages rather than alienates the family - Elicits family values during goals of care discussion for a child with chronic liver failure
Level 5 <i>Mentors others to develop positive therapeutic relationships</i> <i>Models and coaches others in patient- and family-centered communication</i>	- Acts as a mentor for resident disclosing bad news to a patient and the patient's family - Develops a curriculum on patient- and family-centered communication, including navigating difficult conversations related to liver transplant
Assessment Models or Tools	- Direct observation - Standardized patients
Curriculum Mapping	

Notes or Resources	• Laidlaw, Anita, and Jo Hart. 2011. "Communication Skills: An Essential Component of Medical Curricula. Part I: Assessment of Clinical Communication: AMEE Guide No. 51." <i>Medical Teacher</i>. 33(1): 6-8. https://doi.org/10.3109/0142159X.2011.531170. • Makoul, Gregory. 2001. "Essential Elements of Communication in Medical Encounters: the Kalamazoo Consensus Statement." <i>Academic Medicine</i>. 76(4): 390-393. https://journals.lww.com/academicmedicine/Fulltext/2001/04000/Essential_Elements_of_Communication_in_Medical.21.aspx#pdf-link. • Makoul, Gregory. 2001. "The SEGUE Framework for Teaching and Assessing Communication Skills." <i>Patient Education and Counseling</i>. 45(1): 23-34. https://doi.org/10.1016/S0738-3991(01)00136-7. • Symons, Andrew B., Andrew Swanson, Denise McGuigan, Susan Orrange, and Elie A. Akl. 2009. "A Tool for Self-Assessment of Communication Skills and Professionalism in Residents." <i>BMC Medical Education</i> 9:1. doi: 10.1186/1472-6920-9-1.
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Interpersonal and Communication Skills 2: Interprofessional and Team Communication Overall Intent: To communicate effectively with the health care team, including consultants	
Milestones	Examples
Level 1 <i>Respectfully requests a consultation, with guidance</i> <i>Identifies the members of the interprofessional team</i>	• Requests a nephrology consultation for a patient with cirrhosis and renal dysfunction and formulates question with attending guidance • Recognizes the important roles of nursing, the primary care team, and other consultants
Level 2 <i>Clearly and concisely requests consultation by communicating patient information</i> <i>Participates within the interprofessional team</i>	• When requesting a consult from the infectious disease team, clearly and concisely describes the recent history of a child post-transplant on immunosuppression with fever • Contacts the dietician to co-manage a patient with cirrhosis and ascites to discuss decreasing the sodium in the parenteral nutrition
Level 3 <i>Formulates a specific question for consultation and tailors communication strategy</i> <i>Uses bi-directional communication within the interprofessional team</i>	• After a consultation has been completed, communicates with the primary care team to verify they have received and understand the recommendations • Using closed-loop communication with the liver transplant team social worker, ensures that a patient has received specialized formula that was ordered to home
Level 4 <i>Coordinates consultant recommendations to optimize patient care</i> <i>Facilitates interprofessional team communication</i>	• Initiates a multidisciplinary meeting to develop a shared care plan for a patient with Alagille syndrome • Plans and leads a multidisciplinary team meeting for a patient with advanced liver disease, hepatorenal syndrome, and pulmonary hypertension
Level 5 <i>Maintains a collaborative relationship with referring providers that maximizes adherence to practice recommendations</i> <i>Coaches others in effective communication within the interprofessional team</i>	• Continues to touch base with consultants regularly to update patient care plan after discharge from the hospital • Mediates a conflict among members of the health care team about a difficult decision regarding listing a patient for liver transplant
Assessment Models or Tools	• Clinical evaluations • Direct observation • Simulation
Curriculum Mapping	•
Notes or Resources	• Braddock, Clarence H., Kelly A. Edwards, Nicole M. Hasenberg, Tracy L. Laidley, and Wendy Levinson. 1999. "Informed Decision Making in Outpatient Practice: Time to Get

- Back to Basics." *JAMA* 282(24): 2313-2320.
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 - Fay, David, Michael Mazzone, Linda Douglas, and Bruce Ambuel. 2007. "A Validated, Behavior-Based Evaluation Instrument for Family Medicine Residents." *MedEdPORTAL* 3: 622. <https://www.mededportal.org/publication/622/#260535>.
 - François, José. 2011. "Tool to Assess the Quality of Consultation and Referral Request Letters in Family Medicine." *Canadian Family Physician*. 57(5): 574-575.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093595/>.
 - Green, Matt, Teresa Parrott, and Graham Cook. 2012. "Improving Your Communication Skills." *BMJ*. 344:e357. <https://doi.org/10.1136/bmj.e357>.
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<https://doi.org/10.3109/0142159X.2013.769677>.
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<https://pdfs.semanticscholar.org/8a78/600986dc5cffcab89146df67fe81aebeaecc.pdf>.
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<http://universe.gi.org/osce.asp>. Accessed 2019.
 - Roth, Christine G., Karen W. Eldin, Vijayalakshmi Padmanabhan, and Ellen M. Freidman. 2019. "Twelve Tips for the Introduction of Emotional Intelligence in Medical Education." *Medical Teacher*. 41(7): 1-4. <https://doi.org/10.1080/0142159X.2018.1481499>.

Interpersonal and Communication Skills 3: Communication within Health Care Systems Overall Intent: To effectively communicate using a variety of tools and methods	
Milestones	Examples
Level 1 <i>Records accurate information in the patient record</i> <i>Identifies the importance of and responds to multiple forms of communication (e.g., in-person, electronic health record (EHR), telephone, email)</i>	• Corrects progress note after attending identifies outdated plan • Understands that communication with a patient's family should be through a secure patient portal or by phone
Level 2 <i>Records accurate and timely information in the patient record</i> <i>Selects appropriate method of communication, with prompting</i>	• Provides organized and accurate documentation that supports the treatment plan and limits extraneous information • Asks resident to call nurse with urgent request for labs after rounds
Level 3 <i>Concisely documents updated, prioritized, diagnostic and therapeutic reasoning in the patient record</i> <i>Aligns type of communication with message to be delivered (e.g., direct and indirect) based on urgency and complexity</i>	• Produces concise documentation that reflects complex clinical thinking and planning • Effectively communicates with team members, including triaging urgency of communication and most appropriate communication method • Recognizes value of in-person conversations
Level 4 <i>Documents diagnostic and therapeutic reasoning, including anticipatory guidance</i> <i>Demonstrates exemplary written and verbal communication</i>	• Documentation is consistently accurate, organized, and concise; reflects complex clinical reasoning and frequently incorporates contingency planning • Communicates effectively and proactively with collaborating physicians and teams, and identifies communication gaps
Level 5 <i>Models and coaches others in documenting diagnostic and therapeutic reasoning</i> <i>Coaches others in written and verbal communication</i>	• Leads teams by modeling a range of effective tools and methods of communication that fit the context of a broad variety of clinical encounters • Designs and facilitates an EHR order set or disease-specific note template that integrates effective communication among teams, departments, and institutions
Assessment Models or Tools	• Direct observation • Evaluations • Simulation

Curriculum Mapping	•
Notes or Resources	• Bierman, Jennifer A., Kathryn Kinner Hufmeyer, David T. Liss, A. Charlotta Weaver, and Heather L. Heiman. 2017. "Promoting Responsible Electronic Documentation: Validity Evidence for a Checklist to Assess Progress Notes in the Electronic Health Record." <i>Teaching and Learning in Medicine</i>. 29(4): 420-432. https://doi.org/10.1080/10401334.2017.1303385. • Haig, Kathleen M., Staci Sutton, and John Whittington. 2006. "SBAR: A Shared Mental Model for Improving Communications Between Clinicians." <i>Joint Commission Journal on Quality and Patient Safety</i>. 32(3):167-75. https://doi.org/10.1016/s1553-7250(06)32022-3. • Robertson, Samantha T., Ingrid C.M. Rosbergen, Andrew Burton-Jones, Rohan S. Grimley, and Sandra G. Brauer. 2022. "The Effect of the Electronic Health Record on Interprofessional Practice: A Systematic Review." <i>Applied Clinical Informatics</i> 13(3): 541-559. doi: 10.1055/s-0042-1748855. Epub 2022 Jun 1.PMID: 35649501. • Starmer, Amy J., Nancy D. Spector, Rajendu Srivastava, April D. Allen, Christopher P. Landrigan, Theodore Sectish, and I-PASS Study Group. 2012. "I-Pass, a Mnemonic to Standardize Verbal Handoffs." <i>Pediatrics</i> 129.2: 201-204. https://doi.org/10.1542/peds.2011-2966.

Interpersonal and Communication Skills 4: Complex Communication around Serious Illness Overall Intent: To sensitively and effectively communicate about serious illness with patients and their families/caregivers	
Milestones	Examples
Level 1 <i>Recognizes when a topic may be challenging when communicating with patients and their families</i>	Recognizes importance of communicating prognosis to facilitate shared decision making, but is unable to do so independently
Level 2 <i>Assesses patients' and patients' families' situational awareness and identifies preferences for receiving challenging information</i>	Using open-ended questions and appropriate pauses, determines a patient's/family's understanding of prognosis and preferences for learning outcome data
Level 3 <i>Communicates challenging information and attends to emotional responses of patients and patients' families</i>	- Compassionately communicates a newly identified and unexpected complication, such as PTLD or portal vein stenosis, to a patient coming in for routine post-transplant care - Remains calm and responds compassionately when a patient's family has an unexpected emotional response upon hearing their child needs re-transplantation
Level 4 <i>Anticipates needs of patients and their families and tailors communication according to the situation, emotional response, and medical uncertainty</i>	- Engages family and multispecialty team of a patient with a catastrophic complication while awaiting liver transplant to discuss options, including possibility of removing from wait list - Considers the autonomy of an adolescent patient who does not wish to pursue liver transplantation for metabolic liver disease despite the parents' wishes
Level 5 <i>Coaches others in the communication of challenging information</i>	- Serves as a role model in leading multidisciplinary care conferences - Creates a teaching session for medical students on breaking bad news
Assessment Models or Tools	- Direct observation - Objective structured clinical examination - Multisource feedback - Simulation
Curriculum Mapping	
Notes or Resources	- Back, Anthony, Robert Arnold, and James Tulsy. 2009. <i>Mastering Communication with Seriously Ill Patients</i>. Cambridge: Cambridge University Press. - Kaufman, Miriam, Eyal Shemesh, Tami Benton. 2010. "The Adolescent Transplant Recipient." <i>Pediatric Clinics of North America</i> Apr;57(2): 575-92, table of contents. doi: 10.1016/j.pcl.2010.01.013. PMID: 20371053. - Levetown, Marcia, and American Academy of Pediatrics Committee on Bioethics. 2008. "Communicating with Children and Families: From Everyday Interactions to Skill in Conveying Distressing Information." <i>Pediatrics</i> 121(5):e1441-60. https://doi.org/10.1542/peds.2008-0565. - Puscas, Liana, Jennifer R. Kogan, and Eric S. Holmboe. 2021. "Assessing Interpersonal and Communication Skills." <i>Journal of Graduate Medical Education</i> 13(2s): 91–95.

<https://meridian.allenpress.com/jgme/article/13/2s/91/464384/Assessing-Interpersonal-and-Communication-Skills>.

- VitalTalk. www.vitaltalk.org. Accessed 2018.

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

Milestones 1.0	Milestones 2.0
PC1: Provide transfer of care that ensures seamless transitions	SBP4: System Navigation for Patient-Centered Care – Transitions in Care
PC2: Make informed diagnostic and therapeutic decisions that result in optimal clinical judgement	PC1: History and Physical Exam
PC3: Develop and carry out management plans	PC3: Patient Management in Pediatric Transplant Hepatology MK2: Clinical Reasoning for Pediatric Transplant Hepatology ICS1: Patient- and Family-Centered Communication
PC4: Provide appropriate role modeling	PBLI2: Reflective Practice and Commitment to Personal Growth
	PC2: Organize and Prioritize Patient Care
	PC4: Transplant Hepatology Procedures
	PC5: Pre-Transplant Hepatology
	PC6: Peri-Operative and Post-Transplant Hepatology
MK1: Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems	MK1: Clinical Knowledge of Pediatric Transplant Hepatology (Non-Procedural) PBLI1: Evidence-Based and Informed Practice
SBP1: Work effectively in various health care delivery settings and systems relevant to their clinical specialty	SBP3: System Navigation for Patient-Centered Care – Coordination of Care SBP6: Physician Role in Health Care Systems
SBP2: Coordinate patient care within the health care system relevant to their clinical specialty	SBP3: System Navigation for Patient-Centered Care – Coordination of Care SBP4: System Navigation for Patient-Centered Care – Transitions in Care SBP5: Population and Community Health ICS1: Patient- and Family-Centered Communications ICS2: Interprofessional and Team Communication
SBP3: Incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate	SBP5: Population and Community Health SBP6: Physician Role in Health Care Systems
SBP4: Work in inter-professional teams to enhance patient safety and improve patient care quality	SBP1: Patient Safety ICS2: Interpersonal and Team Communications

SBP5: Participate in identifying system errors and implementing potential systems solutions	SBP1: Patient Safety SBP2: Quality Improvement
PBLI1: Identifying strengths, deficiencies, and limits to one's knowledge and expertise	PBLI1: Evidence-Based and Informed Practice PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI2: Systemically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement	SBP2: Quality Improvement PBLI2: Reflective Practice and Commitment to Personal Growth
PBLI3: Use information technology to optimize learning and care delivery	PBLI1: Evidence-Based and Informed Practice PBLI2: Reflective Practice and Commitment to Personal Growth ICS3: Communication within Health Care Systems
PBLI4: Participate in the education of patients, families, students, residents, fellows, and other health professionals	SBP5: Population and Community Health PBLI1: Evidence-Based and Informed Practice ICS1: Patient- and Family-Centered Communication
PROF1: Professional Conduct: High standards of ethical behavior which includes maintaining appropriate professional boundaries	PROF1: Professional Behavior PROF2: Ethical Principles
PROF2: Trustworthiness that makes colleagues feel secure when one is responsible for care of patients	PBLI1: Evidence-Based and Informed Practice PROF1: Professional Behavior PROF3: Accountability/Conscientiousness ICS1: Patient- and Family-Centered Communication
PROF3: Provide leadership skills that enhance team functioning, the learning environment, and/or the health care delivery system/environment with the ultimate intent of improving care of patients	PROF2: Ethical Principles PROF3: Accountability/Conscientiousness ICS2: Interprofessional and Team Communication ICS3: Communication within Health Care Systems
PROF4: The capacity to accept that ambiguity is part of clinical medicine and to recognize the need for and to utilize appropriate resources in dealing with uncertainty	PBLI1: Evidence-Based and Informed Practice PROF2: Ethical Principles ICS1: Patient- and Family-Centered Communication
	PROF4: Well-Being
ICS1: Communicate effectively with physicians, other health professionals and health-related agencies	ICS2: Interprofessional and Team Communication ICS3: Communication within Health Care Systems
ICS2: Work effectively as a member or leader of a health care team or other professional group	PBLI2: Reflective Practice and Commitment to Personal Growth PROF3: Accountability/Conscientiousness ICS2: Interprofessional and Team Communication
ICS3: Act in a consultative role to other physicians and health professionals	MK2: Clinical Reasoning for Pediatric Transplant Hepatology ICS2: Interprofessional and Team Communication

	ICS3: Communication within Health Care Systems
	ICS4: Complex Communication around Serious Illness

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/>

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