EPA 7: Form clinical questions and retrieve evidence to advance patient care

1.	**Description of the activity**	On day 1 of residency, it is crucial that residents be able to identify key clinical questions in caring for patients, identify information resources, and retrieve information and evidence that will be used to address those questions. Day 1 residents should have basic skill in critiquing the quality of the evidence and assessing applicability to their patients and the clinical context. Underlying the skill set of practicing evidence-based medicine is the foundational knowledge an individual has and the self-awareness to identify gaps and fill them. **Functions** • Develop a well-formed, focused, pertinent clinical question based on clinical scenarios or real-time patient care. • Demonstrate basic awareness and early skills in appraisal of both the sources and content of medical information using accepted criteria. • Identify and demonstrate the use of information technology to access accurate and reliable online medical information. • Demonstrate basic awareness and early skills in assessing applicability/ generalizability of evidence and published studies to specific patients. • Demonstrate curiosity, objectivity, and the use of scientific reasoning in acquisition of knowledge and application to patient care. • Apply the primary findings of one's information search to an individual patient or panel of patients. • Communicate one's findings to the health care team (including the patient/family). • Close the loop through reflection on the process and the outcome for the patient.
2.	**Most relevant domains of competence**	❐ Patient Care ☑ Knowledge for Practice ☑ Practice-Based Learning and Improvement ❐ Interpersonal and Communication Skills	❐ Professionalism ❐ Systems-Based Practice ❐ Interprofessional Collaboration ❐ Personal and Professional Development
3.	**Competencies within each domain critical to entrustment decisions** (See Appendix C)	KP 3 PBLI 6 KP 4 PBLI 7 PBLI 1 PBLI 9 PBLI 3 ICS 2	

Critical Competency	Pre-Entrustable Behaviors	Entrustable Behaviors
KP 3: Apply established and emerging principles of clinical sciences to diagnostic and therapeutic decision making, clinical problem solving, and other aspects of evidence-based health care	May remember and understand clinical science principles but lacks the ability to apply the knowledge to common medical and surgical conditions and basic preventive care. (IM, PEDS, SURG)	Possesses sufficient clinical science knowledge and the ability to apply that required knowledge to common medical and surgical conditions and basic preventive care (e.g., can make a diagnosis, recommend initial management, and recognize variation in the presentation of common medical and surgical conditions). (IM, PEDS, SURG)
KP 4: Apply principles of epidemiological sciences to the identification of health problems, risk factors, treatment strategies, resources, and disease prevention and health promotion efforts for patients and population	May remember and understand epidemiologic principles but lacks the ability to apply the knowledge to common medical and surgical conditions and basic preventive care. (IM, PEDS, SURG)	Possesses sufficient knowledge of clinical epidemiology and the ability to apply that required knowledge to common medical and surgical conditions and basic preventive care (e.g., can make a diagnosis, recommend initial management, and recognize variation in the presentation of common medical or surgical conditions). (IM, PEDS, SURG)
PBLI 1: Identify strengths, deficiencies, and limits in one's knowledge and expertise	Relies on external prompts for understanding one's strengths, deficiencies, and limits. The learner acknowledges these external assessments, but understanding of performance is superficial and limited to the overall grade or bottom line; there is little understanding of how the performance measure relates in a meaningful way to the learner's specific level of knowledge, skills, and attitudes. The lack of reflection and insight into limitations results in not recognizing when help is needed, sometimes causing unintended consequences for patients or missed opportunities for learning and self-improvement. (IM, PEDS)	Relies primarily on internal prompts for understanding one's strengths, deficiencies and limits through a process of reflection and insight. Reflection may be in response to uncertainty, discomfort, or tension in completing clinical duties; a critical incident; or suboptimal practice or outcomes. Recognizes limitations and has developed a personal value system of help-seeking for the sake of the patient that supersedes any perceived value of physician autonomy, resulting in appropriate requests for help when needed. (IM, PEDS)

Critical Competency	Pre-Entrustable Behaviors	Entrustable Behaviors
PBLI 3: Identify and perform learning activities that address one's gaps in knowledge, skills, or attitudes	Engages in learning activities based on externally provided and readily available curricular materials, irrespective of learning style, preferences, or appropriateness of activity. Self-directed learning goals do not specify any outcome measures. (PEDS, PSYCH)	Engages in learning activities and sets goals based on both internal and external analysis of gaps in knowledge, skills, and attitudes. Matches learning activities to learning preferences and styles. Seeks evidence-based information to meet learning goals (e.g., practice guidelines, Cochrane database, PubMed). (PEDS, PSYCH)
PBLI 6: Locate, appraise, and assimilate evidence from scientific studies related to patients' health problems	Rarely "slows down" to reconsider an approach to a problem, ask for help, or seek new information. Needs assistance to translate medical information needs into well-formed clinical questions. Unfamiliar with strengths and weaknesses of the medical literature. Accepts the findings of clinical research studies without critical appraisal. (IM, PEDS, PSYCH)	Routinely "slows down" to reconsider an approach to a problem, ask for help, or seek new information. Can translate medical information needs into well-formed, searchable clinical questions. Understands levels of evidence and can use advanced search methods. Able to critically appraise a topic by analyzing the major outcomes; however, may need guidance in understanding the subtleties of the evidence. (IM, PEDS, PSYCH)
PBLI 7: Use information technology to optimize learning and care	Generally does not initiate attempts to use information technology without mandatory assignments and direct help. Unable to choose between multiple available databases for clinical query or for addressing learning needs. Unable to filter or prioritize the information retrieved, resulting in too much information, much of which is not useful. Failure to achieve success may worsen perception of ease of using information technology, leading to resistance to adopting new technologies. (PEDS, EM)	Demonstrates a willingness to try new technology for patient care assignments or learning. Able to identify and use several available databases, search engines, or other appropriate tools, resulting in a manageable volume of information, most of which is relevant to the clinical question. Basic use of an electronic health record (EHR) is improving, as evidenced by greater efficacy and efficiency in performing needed tasks. Beginning to identify shortcuts to finding the right information quickly, such as using filters. Also avoids shortcuts that lead one astray from the correct information or perpetuate incorrect information in the EHR. (PEDS, EM)

Critical Competency	Pre-Entrustable Behaviors	Entrustable Behaviors
PBLI 9: Obtain and use information about individual patients, populations of patients, or communities from which patients are drawn to improve care	Focused on individual patients only. Does not consider population health to be the role of a practitioner and therefore has not become informed about the needs and assets of the community. Does not collaborate with community agencies, professionals, or others to improve patient or population health. Is unaware of a physician's public health reporting responsibilities and does not engage in required reporting. (PEDS)	Understands that population health issues affect the health of patients and therefore identifies sources of information about the needs and resources of the community. Interacts and begins to work collaboratively with community agencies, professionals, and others to address population health issues (e.g., disease and injury prevention). Usually engages in required public health reporting. (PEDS)
ICS 2: Communicate effectively with colleagues within one's profession or specialty, other health professionals, and health-related agencies	Often communicates from a template or prompt with rigid rules-based recitation of facts. Communication does not change based on context, audience, or situation. Uses unidirectional communication that fails to encourage ideas or opinions from other team members. Does not match communication tool to situation (e.g., email, telephone, pager, texting, electronic health record [EHR], face-to-face). Defers or avoids difficult or ambiguous conversations. (IPEC, PEDS, IM)	Listens actively and encourages ideas and opinions from other team members. Successfully tailors communication strategy and message to the audience, purpose, and context in most situations. Fully aware of the purpose of the communication; can efficiently tell a story and make an argument. Beginning to improvise in unfamiliar situations. Generally matches the communication tool to the situation. Discusses care plans with the team and keeps them up to date. Engages others (e.g., supervisors) to help with feedback to other team members even when those conversations are difficult or uncomfortable. (IPEC, PEDS, IM)

Pre-Entrustable Learners

Expected behaviors for a pre-entrustable learner

The learner at this level often relies more on linear thinking than does a more advanced learner, has less experience to draw on, and is less aware of her own knowledge limitations. The pre-entrustable learner may be overly focused on the individual patient, less aware of or attentive to trends or understanding about populations and communities of patients, and may in general jump to conclusions or generalizations without fully understanding the complexity of the situation or the types of information or evidence needed. This learner may have an underdeveloped mental model of the problem even after multiple iterations of the problem-solving cycle, and, even with sufficient prior knowledge in place, may not be able to activate it to their advantage in problem solving. This learner needs improvement in the ability to both retrieve and assess relevant evidence. Finally, this learner is not always able to translate new findings into the care of the patient or a panel of patients.

Vignette for a pre-entrustable learner

Sierra is on the transfusion medicine service and is asked to consult on a patient for whom the diagnosis of thrombotic thrombocytopenic purpura (TTP) is being considered and the initiation of plasmapheresis is being requested. Sierra reviews the chart quickly and notes that the patient was admitted with thrombocytopenia 24 hours ago. She notes a lack of agreement between the primary team and the consulting hematology service on the diagnosis. She continues to collect the data that she feels are pertinent and then notifies the transfusion medicine fellow that she has a new consult and is ready to present.

Upon hearing the presentation of Sierra's chart review on the patient, the fellow asks Sierra what she thinks is the etiology of the thrombocytopenia. Sierra states that the chart suggests TTP. When the fellow prompts for other causes of thrombocytopenia, Sierra is able to list several other diagnoses that should be considered. The fellow then asks Sierra what she thinks the next steps should be. Sierra states that they should go see the patient and talk to the hematology experts to figure out what the diagnosis is.

The fellow prompts Sierra to review some background literature on the differential diagnosis of thrombocytopenia, the diagnosis of TTP, and its treatment. Sierra consults her pocket medicine book and also searches online using a generic web browser. She returns stating that they need to review the blood smear, collect more laboratory data, and get some more historical facts from the patient. She states that she suspects TTP and thinks that, if they confirm by looking at the smear, they should initiate plasmapheresis as soon as possible.

The attending physician now joins the discussion and asks if Sierra and the fellow have reviewed the most recent evidence regarding the use of plasmapheresis in TTP. Sierra states that she has reviewed the literature and that plasmapheresis is useful. The attending physician asks her if she ran across any new evidence in this area and prompts Sierra to think about where she might find that evidence. Sierra states that she searched the Internet but that she could also use a summary updated source very quickly. She leaves, reviews a summary source, and returns again, suggesting that plasmapheresis should be started. At this point, the attending physician prompts Sierra to review the case one more time to identify any patient-specific issues that might suggest that the general evidence is not applicable to this patient, noting that the patient is on several specific medications that may be associated with TTP.

Entrustable Learners

Expected behaviors for an entrustable learner

The learner at this level routinely identifies situations in patient care in which additional information is needed based on assessment of her own knowledge gaps and patient needs. She formulates focused, pertinent clinical questions based on clinical scenarios, or real-time care of a patient or panel of patients and is willing and able to take the time to identify appropriate evidence to answer those questions. This learner is able to focus her cognitive processes on discerning relevant factors, identifying the unknowns, and developing knowledge for generating a solution via just-in-time learning. When gaps in personal knowledge are identified, she takes steps to address those gaps in order to maintain a sufficient biophysical, clinical, epidemiological, and social-behavioral scientific

knowledge base that can be applied to patient care activities. This learner demonstrates skill in appraising sources, using information technology appropriately, and generating a manageable volume of information. The learner is able to assess the applicability and generalizability of the information. When gaps in the evidence are identified, she takes steps to "close the loop" to determine ways to improve care.

Vignette for an entrustable learner

Sierra is on the transfusion medicine service and is asked to consult on a patient for whom the diagnosis of TTP is being considered and the initiation of plasmapheresis is being requested. Sierra reviews the chart quickly, preparing to present to her fellow and attending physician, and notes a lack of agreement between the primary team and the consulting hematology service about the diagnosis. She is not familiar with the specific diagnostic criteria for TTP, so she goes to an online evidence summary source for a quick review. While reviewing the diagnostic criteria, she finds that there are several different causes of TTP and TTP-like syndromes, including medications. She notes several key references for later reading.

Sierra reviews the electronic medical record in more detail, paying particular attention to the data she has read that will help differentiate the diagnosis of TTP from other disease states. Seeing that some of the necessary information is not included in the chart notes, she tells the fellow that she will go talk to the patient and then meet the fellow in the laboratory to review the peripheral smear. On interviewing the patient, she identifies one medication known to be associated with a TTP-like syndrome and also notes that the patient has had a gastric bypass in the past, which puts the patient at risk for nutritional deficiencies such as vitamin B12.

Sierra reviews the peripheral smear with the hematopathology and transfusion fellows and then feels that she is ready to present the patient to the fellow and attending physician. When prompted by the fellow to outline her assessment, Sierra outlines a differential diagnosis that considers the patient-specific key features. She includes medication-associated TTP. She states that she came across an association with one of the patient's medications in a review article, but that she is not aware of the actual incidence, reporting that she has a reference for an original article that

she would like to pull because it will give her a more accurate sense of the association. She also includes several other disease states in her differential diagnosis, including B12 deficiency, noting that there are several case reports in the literature describing B12 deficiency and TTP presenting in similar ways.

At this point, the fellow asks Sierra what she thinks they should do next for the patient. Sierra states that based on her reading, plasmapheresis should not be initiated while there is still doubt about the diagnosis. She suggests that they need a few more laboratory studies and wonders aloud if there is evidence to support the use of empiric plasmapheresis in this type of a presentation. She also asks if there is harm in doing plasmapheresis if the diagnosis is actually B12 deficiency or medication-associated TTP. She confirms with the fellow that she should take a few minutes to search PubMed for any controlled-trial evidence in this area.

The attending physician now joins the discussion. Sierra reports from her literature search that there is strong and consistent evidence from randomized controlled trials for using plasmapheresis in TTP, but that this is less strong if the TTP is associated with a medication or if an alternative diagnosis is being considered. The attending physician agrees and confirms Sierra's recommendations to check several more lab values, including B12, and to postpone plasmapheresis for now. As a team, they go to discuss their recommendations with the primary team and the hematology consulting team. As they leave, Sierra suggests that they bring several of the articles with them for the team.