## Curricular Components for Common Subspecialty EPA

<table>
<thead>
<tr>
<th>EPA Title</th>
<th>Engage in scholarly activities through discovery, application, and dissemination of new knowledge (broadly defined)</th>
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<tbody>
<tr>
<td><strong>Description of the activity</strong></td>
<td>Brief general description: Subspecialists completing training are expected to be able to engage in a range of scholarly activities that promote lifelong learning, reflective practice, critical thinking, and discovery. The broad areas for discovery, application, and dissemination of new knowledge include but are not limited to the following: basic, clinical, or translational science; health services/care delivery research, clinical effectiveness research, implementation science, quality improvement and patient safety research; bioethics; education; and public policy.</td>
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The specific functions which define this EPA include:

- Appraising and assimilating new knowledge, concepts, and techniques related to the field of one’s practice
- Critically analyzing one’s own work as well as the work of others
- Formulating clear and testable questions
- Designing and conducting high quality scholarly activities in clinical, education, laboratory or other environments to generate new knowledge
- Engaging with colleagues, teams and/or networks to conduct scholarly activities
- Identifying the potential resources for financial support to conduct scholarly activities
- Applying and integrating new knowledge to other settings (e.g. clinical, policy)
- Disseminating scholarly products into oral and/or written forms of communication for the benefit of stakeholders that may include the patients, the public, trainees, colleagues and other health professionals
- Demonstrating ethical and legal principles and practices in conducting scholarly activities
- Engaging in mentee-mentor relationships to advance scholarship

| **Competencies critical to entrustment decisions** | Information Seeking  
Formulation of Question/Intervention  
Methods and Data Management/Analysis  
Collaboration  
Income and Funding Generation  
Knowledge Dissemination  
Professional Conduct |
Curricular Components that support the functions of the EPA (knowledge, skills and attitudes needed to execute this EPA safely):

Rationale: Regardless of career pathway (academic versus non-academic, generalist versus subspecialist), participation in conducting a scholarly activity teaches physicians to be critical thinkers and evidence-based practitioners. It helps the provider improve his or her ability to analyze, interpret, and apply research evidence at the point of care. Scholarly activity also serves to encourage fellows to consider careers as physician–scientists or clinician–investigators as many have not have prior experience in performing scientific investigations.

Scope of Practice: In order to critically analyze the literature and appreciate the complexities of performing a scientific study, a basic understanding of the components of scholarship are required. This basic knowledge should be acquired in subspecialty training under the direction of a mentor with the appropriate knowledge and skills relevant to the scholarly activity. The scholarly activity should be conducted with appropriate supervision and guidance. For those pursuing a career involving ongoing scholarly activity, some degree of mentorship will continue to be needed until the individual has acquired the necessary skills to independently perform the activities. As the individual gains additional experience, he or she may choose to mentor trainees or junior faculty, helping them to attain the necessary knowledge and skills to understand the components of and conduct a scholarly activity.

Curricular components that support the functions of the EPA:

**Appraising and assimilating new knowledge, concepts, and techniques related to the field of one’s practice**
- Demonstrates an understanding of the principles of basic biostatistics and epidemiology.
- Performs literature searches using appropriate search strategies relevant to the scholarly topic of interest.
- Interprets the literature as to its rigor in study design, including strengths and limitations, primary and secondary outcomes, and its potential implications and/or applications.

**Critically analyzing one’s own work as well as the work of others**
- Through literature searches and clinical care, identifies gaps in knowledge and practice that may lend themselves to scholarly inquiry.
- Summarizes the principles of evidenced-based medicine and applies them to the analysis of the scholarly work.
- Conducts a formal, critical review of a scientific article.

**Formulating clear and testable questions**
- Formulates project questions/interventions based upon identified gaps and needs assessments.
• Discusses proposed questions/interventions with appropriate stakeholders.

**Designing and conducting high quality scholarly activities in clinical, education, laboratory or other environments to generate new knowledge**

• Creates a draft project plan to evaluate feasibility.
• Formally presents the project plan, including detailed methodology, to mentors to receive input and feedback on the approach.
• Designs scholarly activity based upon existing resources, the magnitude of the potential effect and the feasibility.
• Conducts scholarly activity, gathering and then analyzing data to formulate conclusions from the results.
• Evaluates progress throughout the activity.

**Engaging with colleagues, teams and/or networks to conduct scholarly activities**

• Identifies need for a collaborative network to conduct the scholarly activity.
• Identifies resources available to develop the collaborative network.
• Works as a member or leader of the team in delegating and/or completing the assigned tasks.
• Collaborates with colleagues to develop a realistic timeline to complete the project.
• Ensures that one’s assigned task is completed in a timely manner and, if team leader, provides oversight to ensure that work of all team members meets deadlines.

**Identifying the potential resources for financial support to conduct scholarly activities**

• Describes the process for and requirements of submission of grants to obtain financial support.
• Identifies the components of the budget needed to complete the project, including direct and indirect costs.
• Identifies potential sources of financial support and how to find them.
• Describes and, if appropriate, follows the grant routing process within one’s institution.

**Applying and integrating new knowledge to other settings (e.g. clinical, policy)**

• Places knowledge generated from scholarly work in the context of existing literature and practice.
• Describes how knowledge generated from scholarly work can be used to formulate policy, make clinical recommendations, advance educational practices, improve outcomes and/or fill existing knowledge gaps.

**Disseminating scholarly products into oral and/or written forms of communication for the benefit of stakeholders that may include the patients, the public, trainees, colleagues and other health professionals**

• Prepares an abstract/manuscript with the required components.
• Describes and engages in the peer review process.
• Identifies the appropriate venue for dissemination of information.
• Presents findings from scholarly work in written and/or oral format.
• Demonstrates knowledge and rules of authorship and incorporates it in manuscript submission process.

**Demonstrating ethical and legal principles and practices in conducting scholarly activities**
• Demonstrates how to maintain confidentiality of information.
• Utilizes safe laboratory practices.
• Reports data honestly and in its entirely without misleading statements.
• Conducts projects only after obtaining required institutional approvals.
• Complies with requirements in conducting scholarly activities involving humans, animals or tissue.
• Describes elements related to conflicts of interest.

**Engaging in mentee-mentor relationships to advance scholarship**
• Selects a mentor(s) appropriate to the scholarly activity.
• Describes the responsibilities of the mentor and mentee.
• Meets expectations for the roles of the mentee and mentor.

Developed in collaboration with the Council of Pediatric Subspecialties, the Association of Pediatric Program Directors and the American Board of Pediatrics by Richard Mink, MD MACM, Angela Myers, MD MPH, Sarah Pitts, MD, Kristie Ross, MD and Shubhika Srivastava, MD.
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<tr>
<th>COMPETENCY</th>
<th>DESCRIPTION</th>
<th>MILESTONE LEVEL 1</th>
<th>MILESTONE LEVEL 2</th>
<th>MILESTONE LEVEL 3</th>
<th>MILESTONE LEVEL 4</th>
<th>MILESTONE LEVEL 5</th>
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<td>INFORMATION SEEKING</td>
<td>Locate, appraise, and assimilate evidence from scientific studies related to a scholarly topic of interest</td>
<td>Explains the steps in performing a literature search/review using databases relevant to the scholarly topic of interest</td>
<td>Applies search and discovery skills and techniques and selects information relevant to the scholarly topic of interest</td>
<td>Conducts advanced and complex searches and synthesizes the information applicable to the scholarly topic of interest</td>
<td>Assesses the reliability, reputation and relevance of information sources and recognizes their advantages and limitations</td>
<td>Educates others in information/data seeking, accessing, evaluating and verifying search techniques</td>
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<td>FORMULATION OF QUESTION/INTERVENTION</td>
<td>Critically analyze one's own work and that of others in formulating the question or intervention and develop new approaches for investigation</td>
<td>Identifies topics that may lead to the project question/intervention</td>
<td>Formulates project questions/interventions based upon identified gaps. Proposes new ideas but needs assistance in determining which are likely to accomplish the goal</td>
<td>Creates new ways to approach a topic and can differentiate which innovative ideas are likely to be successful after effectively analyzing and interpreting existing evidence</td>
<td>Identifies new trends, complex questions and broader problems and designs substantial projects to address the question. Encourages and inspires creativity in others to enhance innovation</td>
<td>Defines areas of investigation; makes major contributions to the field that build upon the existing body of knowledge; challenges traditional viewpoints</td>
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<td>METHODS AND DATA MANAGEMENT/ANALYSIS</td>
<td>Apply knowledge and skill in developing sound project design and methodologic rigor in data collection, management and analysis</td>
<td>Describes project methods and their application to specific goals; needs assistance in identifying data to collect and in selecting the appropriate data management tool</td>
<td>Identifies data to collect and selects appropriate data collection tool(s); needs assistance in selecting potential study and analytical methods linked to the project</td>
<td>Demonstrates the ability to apply a wide range of methods/techniques based upon the project; is skilled in the use of multiple information/data management techniques and is able to perform analyses</td>
<td>Educates and guides others in the appropriate selection and use of study methods, including data analysis and management</td>
<td>Creates innovative study methods/techniques and new models of data collection and analysis or applies methods/techniques in a novel manner</td>
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<td>COLLABORATION</td>
<td>Work in interprofessional teams and networks to advance scholarship</td>
<td>Acknowledges the value of working in teams to benefit scholarship and for maximizing the potential for impact</td>
<td>Actively participates in and contributes to project teams and local networks; seeks feedback and advice from other network/team members for one's own improvement</td>
<td>Actively seeks and negotiates collaborations; recognizes the importance of team dynamics in working effectively to achieve mutual goals</td>
<td>Recruits, trains, builds and leads sustainable teams/networks across areas of scholarship; helps team members clarify their roles and responsibilities to enhance team performance</td>
<td>Builds collaborative relationships with influential national and international connections engaging individual experts or organizations</td>
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<tr>
<td>INCOME AND FUNDING GENERATION</td>
<td>Develop the necessary skills to obtain project funding</td>
<td>Describes sources for funding and grant application procedures</td>
<td>Develops a grant application suitable for submission, but requires assistance to prepare proposal, including budget</td>
<td>Independently applies for funding from multiple sources and is able to build grant budget</td>
<td>Successful in obtaining funding: educates, advises and guides others on income and funding generation</td>
<td>Influences funding priorities and participates in funding decisions for professional associations and/or organizations</td>
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<td>KNOWLEDGE DISSEMINATION</td>
<td>Present project findings in oral and/or written format and participate in the peer-review process</td>
<td>Explains the components of and the diversity of outlets for publications and presentations; describes the peer-review process</td>
<td>Disseminates results in a variety of outlets but requires instruction; may perform peer-review of manuscripts but requires coaching</td>
<td>Publishes and presents in a variety of outlets, including first-authored publications; performs peer-review of manuscripts without assistance on an ad hoc basis</td>
<td>Supports and enables less experienced investigators to present and publish; is senior author on publications; presents outside the home institution; serves as a reviewer for multiple journals</td>
<td>Nationally and internationally renowned for publications; serves on journal editorial board(s); has multiple publications and reviews in top-tiered journals; keynote speaker at national and international scientific meetings</td>
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<td>PROFESSIONAL CONDUCT</td>
<td>Uphold ethical and legal principles and practices in scholarly work</td>
<td>Demonstrates knowledge of ethical and legal requirements and codes of conduct appropriate for scholarship, including confidentiality</td>
<td>Applies the relevant guidelines for the ethical and legal conduct of scholarship</td>
<td>Ensures ethical principles are adhered to within the scholarly environment and assumes responsibility for working within the legal framework</td>
<td>Educates and advises peers and staff about the ethical and legal requirements in performing scholarly activities and mediates issues related to research integrity</td>
<td>Influences policy and procedures related to the ethical and legal conduct of scholarship</td>
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<td>MENTORING IN SCHOLARSHIP</td>
<td>Foster the mentee-mentor(s) relationship(s) to promote scholarship</td>
<td>Identifies the roles and responsibilities of the mentee in the mentor-mentee relationship; acknowledges that success in scholarship is related to identifying a good mentor</td>
<td>Demonstrates the expected behaviors required to be a good mentor and identifies the roles and responsibilities required to be a good mentor</td>
<td>Acts as mentor to less experienced colleagues and effectively supports their learning; helps mentees to see opportunities and accept challenges that build and develop confidence</td>
<td>Empowers mentees and promotes independence by nurturing talent and shapes the mentoring strategy in the local institution and serves as a role model for mentoring</td>
<td>Recognized and engaged as a regional, national and/or international expert providing mentorship to multiple individuals beyond the local institution</td>
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