

UCNS Neurocritical Care Milestones

For definitions and instructions to complete milestones, please visit the ACGME website.

* UCNS Common Milestones for Interpersonal & Communication Skills, Practice-based Learning and Improvement, Professionalism, and Systems-based Practice, adopted from the ACGME Clinical Neurophysiology milestones
* Subspecialty-specific milestones for Patient Care and Medical Knowledge

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| **1. Systems thinking, including cost- and risk-effective practice – Systems-based Practice** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Identifies and describes the roles of other team members. * Identifies obvious or critical causes of error. | * Minimizes unnecessary diagnostic and therapeutic tests. * Advocates for cost- conscious utilization of resources. * Reports system errors that contribute to patient safety. | * Practices cost-effective patient care. * Advocates for safe patient care and optimal patient care systems. * Participates in quality assurance or improvement activities to improve patient   safety. | * Leads quality assurance or improvement activities. * Initiates care delivery models to mitigate barriers to cost- effective and high- quality care. | * Mentors others in quality improvement activities. * Mentors others in developing care delivery models. |
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| **Comments:**  **Not Applicable** | | | | |

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| 1. **Self-directed learning – Practice-based Learning and Improvement**    * Identify strengths, deficiencies, and limits in one’s knowledge and expertise    * Set learning and improvement goals    * Identify and perform appropriate learning activities | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Engages in self- reflection when asked to do so. * Responsive to feedback when offered. | * Welcomes unsolicited feedback. * Engages in self- reflection routinely. * Receptive to feedback from multiple sources. | * Recognizes sub-optimal performance as an opportunity for self- improvement. * Consistently incorporates feedback in learning plan. | * Demonstrates proficiency in reconciling disparate or conflicting feedback. * Continuously self- reflects and incorporates self- improvement opportunities to maximize practice improvement. * Seeks 360-degree feedback. | * Mentors others on self- reflection. * Mentors others on the process of self- improvement. * Provides constructive feedback to others in a non-judgmental manner. |
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| **Comments:**  **Not Applicable** | | | | |

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| **3. Compassion, integrity, accountability, and respect for self and others – Professionalism** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Demonstrates compassion, sensitivity and responsiveness to patients and families. * Demonstrates non- discriminatory behavior in all interactions including diverse and vulnerable populations. * Consistently demonstrates professional behavior, including, boundaries, dress, and timeliness in all activities. | * Demonstrates appropriate steps to address impairment in self. * Demonstrates compassionate practice of medicine, even in context of disagreement with patient beliefs. * Incorporates patients’ socio-cultural needs and beliefs into patient care. * Advocates for quality patient care. | * Advocates to reduce healthcare disparities. * Demonstrates appropriate steps to address impairment in colleagues. * Committed to managing conflicts of interest with sponsors and/or for- profit industries. | * Mentors others in the compassionate practice of medicine, even in context of disagreement with patient beliefs. * Mentors others in sensitivity and responsiveness to diverse and vulnerable populations. | * Engages in scholarly activity regarding professionalism in the subspecialty. * Advocates for quality patient care at a regional or national level. * Advocates to reduce healthcare disparities at a regional or national level. |
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| **Comments:**  **Not Applicable** | | | | |

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| **4. Knowledge about, respect for, and adherence to the ethical principles relevant to the practice of medicine, remembering in particular**  **that responsiveness to patients that supersedes self-interest is an essential aspect of medical practice – Professionalism** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Demonstrates ability to discuss common ethical principles and identify ethical issues in practice. | * Consistently displays responsiveness to patients that supersedes self-interest. | * Analyzes and manages ethical issues in straightforward clinical situations. | * Analyzes and manages ethical issues in complex clinical situations. | * Demonstrates leadership and mentorship in applying ethical principles. * Active participant on hospital ethics committee. |
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| **Comments:**  **Not Applicable** | | | | |

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| **5. Relationship development, teamwork, and managing conflict – Interpersonal and Communication Skills** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Develops a therapeutic relationship with patients in uncomplicated situations. * Actively participates in team-based care. | * Manages simple patient/ family related conflicts. * Engages patients in shared decision making. * Consistently demonstrates respect for all team members. | * Manages conflict in complex situations. * Uses easy-to- understand language in all phases of communication (avoids “medicalese” and considers the health literacy of the recipient). * Consistently demonstrates respect for healthcare providers from other   departments. | * Manages conflict across specialties and systems of care. * Leads team-based patient care activities. | * Engages in scholarly activity regarding teamwork and conflict management. * Is proficient in crucial conversations. |
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| **Comments:**  **Not Applicable** | | | | |

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| **6. Demonstrates communication skills which result in effective information exchange and collaboration with patients, their families and other healthcare professionals – Interpersonal and Communication Skills** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Completes documentation in a timely fashion. * Describes how to communicate respectfully with persons of different socioeconomic and cultural backgrounds. * Follows through on patient communications. * Forwards notes to appropriate providers. | * Educates patients about their diseases and management including risks and benefits of treatment options. * Effectively communicates the results of a neurologic consultation in a timely manner. * Effectively communicates with other healthcare professionals. | * Effectively gathers information from collateral sources when necessary. * Demonstrates synthesis, formulation, and thought process in documentation. * Demonstrates effective non-verbal communication skills. | * Mentors colleagues in timely, accurate and efficient documentation. * Consistently uses teach back in patient encounters. * Models cross-cultural communication and establishes therapeutic relationships with persons of diverse socioeconomic and cultural backgrounds. | * Consistently receives highest tenth percentile patient/family feedback on communication skills on standardized validated assessments. * Develops patient education materials related to the subspecialty. * Engages in scholarly activity regarding interpersonal communication in the subspecialty. |
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| **Comments:**  **Not Applicable** | | | | |

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| **7. Research and other scholarly activity** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Reads subspecialty- scientific literature. | * Critically evaluates and presents results of published research in the subspecialty at journal club or in a similar setting. | * Writes a case report, review article, or chapter suitable for publication in the subspecialty, or * Presents an abstract or lecture in field of the subspecialty at a   professional meeting. | * Designs and initiates original research in field of the subspecialty. * Develops an educational curriculum in the subspecialty. | * Publishes original peer- reviewed research. * Serves as a research mentor. |
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| **Comments:**  **Not Applicable** | | | | |

**Neurocritical Care Medicine Milestones for Patient Care and Medical Knowledge**

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| **8. Gathers and synthesizes essential and accurate information to define each patient’s clinical problem(s). (General Critical Care; Neurocritical Care) –**  **Patient Care 1** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Collects basic relevant historical data * Performs a fundamentally sound physical and neurologic exam * Uses multiple sources to generate differential diagnoses * Identifies patient’s   primary clinical problems   * Recognizes potentially life-threatening problems | * Consistently acquires accurate and relevant histories * Consistently performs accurate and appropriately thorough physical exams * Consistently recognizes patient’s central clinical problem and develops differential diagnoses. | * Acquires accurate histories in an efficient, prioritized, and hypothesis-driven fashion * Performs accurate physical exams that are targeted to the patient’s problems * Uses and synthesizes collected data to define a patient’s central clinical problem(s) and generates a prioritized differential diagnosis and problem list | * Obtains relevant historical subtleties, including sensitive information that informs the differential diagnosis * Identifies subtle or unusual physical exam findings * Efficiently utilizes all sources of secondary data to inform differential diagnosis * Effectively uses history and physical examination skills to minimize the   need for further diagnostic testing | * Role-models and teaches the effective use of history and physical examination skills to minimize the need for further diagnostic testing |
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| **Comments:**  **Not Applicable** | | | | |

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| **9. Develops and achieves comprehensive management plan for each patient. (General Critical Care; Neurocritical Care) – Patient Care 2** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Care plans are basic but generally appropriate and accurate * Generally reacts appropriately to situations that require urgent or emergency care * Will frequently seek additional guidance | * Develops an integrated care plan based on multiple sources and synthesis of complex data * Often recognizes subtle situations that require urgent or emergency care * Generally identifies when additional guidance is needed and appropriate | * Consistently synthesizes complex care plans that reflect all pertinent data * Consistently recognizes situations requiring urgent or emergency care * Consistently seeks additional guidance and/or consultation for complex cases as appropriate | * Appropriately modifies care plans based on patient’s clinical course, additional data, patient preferences, and cost- effectiveness principles * Recognizes disease presentations that deviate from common patterns and require complex decision- making, incorporating diagnostic uncertainty * Manages complex conditions | * Role-models and teaches complex and patient- centered care * Develops customized, prioritized care plans for the most complex patients, incorporating diagnostic uncertainty and cost-effectiveness principles. |
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| **10. Manages patients with progressive responsibility and independence. (General Critical Care issues, e.g., cardiopulmonary arrest, sepsis, shock, hemodynamic instability, hypoxia, multi-organ failure, etc.; Neurocritical Care) – Patient Care 3** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Requires direct supervision in the delivery of critical care * Initiates fundamental management of patients who require urgent or emergency care * Assumes conditional responsibility for patient management decisions | * At times requires direct supervision to ensure safety and quality care of critically ill patients * Conditionally able to temporarily manage problems or common critical care diseases * Generally able to provide emergency care in the ICU * Conditionally able to manage complex patients requiring intensive care with supervision | * Requires indirect supervision to ensure patient safety and quality critical care * Provides appropriate care in the critical care setting under indirect supervision * Provides comprehensive care for single or multiple diagnoses * Initiates management plans for urgent or emergency care * Beginning to demonstrate ability to simultaneously manage multiple critically ill patients * Can independently supervise care provided by other members of a physician-led team | * Independently manages patients in the ICU who have a broad spectrum of clinical disorders, including undifferentiated syndromes * Seeks additional guidance and/or subspecialty consultation as appropriate * Appropriately manages situations requiring urgent or emergency care * Effectively supervises the management decisions of the team in all appropriate clinical settings * Independently manages multiple critically ill patients simultaneously | * Effectively manages unusual, rare, or complex disorders * Ability to triage critically ill patients across a complex health care system * Effectively oversees remote care and/or transfer of critically ill patients at a system level |
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| **Comments:**  **Not Applicable** | | | | |

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| **11. Demonstrates skill in performing, managing, and interpreting invasive procedures. (Procedural, General Critical Care) – Patient Care 4a**  **Required procedures include: Airway Management including Endotracheal Intubation; Basic Critical Care Bronchoscopy; Mechanical Ventilation; Central Venous Access; Arterial Cannulation; Tube Thoracostomy; Lumbar Puncture; Procedural sedation; Interpretation of Pulmonary Artery Data**  **Optional procedures include but are not limited to: Placement of Pulmonary Artery Catheter; placement of Temporary Transvenous Pacemaker; Tracheostomy; Paracentesis; placement of Intracranial Monitoring Devices; etc.** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Able to describe indications for and risks of common invasive procedures * Begins to recognize cases in which invasive procedures are unwarranted or unsafe * Recognizes the need to discuss procedure indications, processes, or potential risks with patients * Understands the informed consent process, and effectively describes risks and benefits of procedures | * Possesses technical skill for safe completion of common invasive procedures with appropriate supervision * Begins to anticipate or prevent common complications * Developing attention to patient safety and comfort when performing invasive procedures * Understands, applies and communicates ethical principles of informed consent for procedures | * Possesses basic technical skill for the completion and interpretation of many common invasive procedures with appropriate indirect supervision * Demonstrates ability to anticipate or prevent common complications * Consistently manages patient safety and comfort when performing invasive procedures * Recognizes appropriate patients, indications, and associated risks in the performance of invasive procedures * Obtains and documents informed consent | * Consistently demonstrates technical skill to successfully and safely perform and interpret invasive procedures * Consistently anticipates or prevents common complications * Maximizes patient comfort and safety when performing invasive procedures * Consistently recognizes appropriate patients, indications, and associated risks in the performance of invasive procedures * Integrates procedures and/or testing results with clinical findings in the evaluation and management of patients * Recognizes procedures and/or testing results that indicate high-risk | * Demonstrates skill to independently perform and interpret complex invasive procedures that are anticipated for future practice * Demonstrates expertise and instructs others in the ability to anticipate or prevent common complications * Demonstrates expertise to teach and supervise others in the performance of invasive procedures * Participates in development of procedural related policies, informed consent documents, and/or educational materials. |

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|  |  |  | state or adverse prognosis   * Recognizes artifacts and normal variants * Effectively obtains and documents informed consent in challenging circumstances (e.g., language or cultural barriers) * Quantifies evidence for risk-benefit analysis during obtainment of informed consent for complex procedures or   therapies |  |
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| **Comments:**  **Not Applicable** | | | | |

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| **12. Demonstrates skill in performing and interpreting non-invasive procedures and/or testing. (Procedural, General Critical Care) – Patient Care 4b**  **Required procedures include: Non-invasive Positive Pressure Ventilation; Non-invasive Hemodynamic Monitors; Cardioversion; Point of Care Ultrasound** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 Ready for | Level 5 |
| * Recognizes patients for whom non-invasive procedures may not be safe * Has begun to perform or interpret non-invasive procedures and/or testing * Recognizes the need to discuss procedure indications, processes, or potential risks with patients * Engages the patient in the informed consent process when appropriate and/or effectively describes risks and benefits of procedures. | * Possesses sufficient skill to safely perform and interpret non-invasive procedures and/or testing with appropriate supervision * Is attentive to patient safety and comfort when performing non-invasive procedures and/or testing procedures * Applies ethical principles of informed procedural consent when appropriate * Recognizes need to obtain informed procedural consent for procedures when appropriate, but ineffectively obtains it * Balances patient safety with the need to acquire diagnostic data | * Generally recognizes appropriate patients, indications, and associated risks in the utilization of non-invasive procedures and/or testing * Generally integrates procedures and/or testing results with clinical features in the evaluation and management of patients * Can safely perform and interpret selected non- invasive procedures and/or testing procedures with minimal supervision * Inconsistently recognizes high-risk findings and artifacts/normal variants * Obtains and documents informed consent when appropriate | * Consistently recognizes appropriate patients, indications, limitations, and associated risks in utilization of non-invasive procedures and/or testing * Consistently performs and interprets non- invasive procedures and/or testing in a safe and effective manner * Integrates procedures and/or testing results with clinical findings in the evaluation and management of patients * Recognizes procedures and/or testing results that indicate high-risk state or adverse prognosis * Recognizes artifacts and normal variants * Effectively obtains and documents informed consent in challenging circumstances (e.g., language or cultural barriers) | * Demonstrates skill to independently perform and interpret complex non-invasive procedures and/or testing * Demonstrates expertise to teach and supervise others in the performance of advanced non-invasive procedures and/or testing |

**Comments:**

**Not Applicable**

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| **13. Demonstrates skill in bedside interpretation of Neurocritical Care-specific procedural data. (Procedural, Neurocritical Care) – Patient Care 4c**  **Required Procedures include: Bedside EEG; Transcranial Dopplers, Basic Intracranial Neuromonitoring (including but, not limited to, intracranial pressure and waveforms, cerebral perfusion pressure, brain tissue oxygen monitoring, brain temperature, etc.), Evoked Potentials, NCV/EMG, Neuroimaging (including, but not limited to CT, MRI, angiography, and perfusion imaging)**  **Optional Procedures include: Advanced Intracranial Neuromonitoring (including, but not limited to, cerebral blood flow, microdialysis, spreading depolarizations, etc.)** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Begins to interpret procedural data under supervision * Recognizes cases in which procedures are unwarranted or unsafe | * Possesses adequate skill to interpret core neurocritical care procedural data with supervision * Conditionally recognizes critical monitoring data and initiates appropriate basic therapy | * Possesses basic skill for the interpretation of common NCC specific procedural data with appropriate supervision * Generally manages patient safety and comfort during procedures * Generally recognizes appropriate patients, indications for, and associated risks of procedures | * Consistently demonstrates skill to successfully and safely interpret NCC specific procedural data * Consistently recognizes appropriate patients, indications, and associated risks of procedures and assess them in context of potential value of procedural data * Integrates procedures and/or testing results with clinical findings in the evaluation and management of patients * Recognizes procedures and/or testing results that indicate high-risk state or adverse prognosis * Recognizes artifacts and normal variants | * Demonstrates skill to independently interpret complex NCC procedural data that are anticipated for future practice * Demonstrates expertise to teach and supervise others in the interpretation of procedural data |

**Not Applicable**

**Comments:**

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| **14. Requests and provides consultative care. (Neurocritical Care, General Critical Care) – Patient Care 5** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Responds to questions or concerns of others when acting as a consultant or utilizing consultant services * Utilizes consultant services when appropriate for patient care * Demonstrates collaboration and professionalism when acting as a consultant * Identifies the need to request appropriate consultations | * Conditionally manages patients as a consultant to other physicians/health care teams * Usually identifies competing risks of recommendations made on complex critically ill patients * Generally formulates a clinical question for a consultant to address | * Provides consultation services for patients with clinical problems requiring basic risk assessment * Consistently recognizes the need to request appropriate consultations * Asks meaningful clinical questions that guide the input of consultants * Recognizes neurological comorbidities in critically ill patients * Consistently recognizes competing risks of recommendations made on complex critically ill patients | * Provides consultation services for patients with basic and complex clinical problems requiring detailed risk assessment * Demonstrates the ability to appropriately request consultative services * Appropriately integrates recommendations from other consultants in order to effectively manage patient care * Provides appropriate recommendations to consultants seeking input regarding neurological and neurosurgical disorders in critically ill   patients | * Provides consultation services for patients with very complex clinical problems requiring extensive risk assessment * Seamlessly integrates appropriate consultative services into all aspects of patient care. * Models management of discordant recommendations from multiple consultants |
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| **Comments:**  **Not Applicable** | | | | |

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| **15. Possesses Clinical knowledge – Medical Knowledge 1** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Possesses fundamental medical knowledge, with culturally appropriate modifiers, required to initiate patient care | * Possesses sufficient scientific, socioeconomic, and behavioral knowledge required to provide care for common medical conditions and basic preventive care | * Possesses the scientific, socioeconomic, and behavioral knowledge required to provide care for common critical care conditions, including basic emergency and   acute care | * Possesses the scientific, socioeconomic, and behavioral knowledge required to provide care for complex conditions and comprehensive critical care | * Possesses the scientific, socioeconomic, and behavioral knowledge required to successfully diagnose and treat medically uncommon, ambiguous, and complex   conditions |
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| **Comments:**  **Not Applicable** | | | | |

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| **16. Knowledge of diagnostic testing and procedures – Medical Knowledge 2** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Possesses foundational knowledge to apply diagnostic testing and procedures to patient care | * Conditionally interprets basic diagnostic tests accurately * Begins to integrate the concepts of pre-test probability and test performance characteristics into patient care decisions | * Consistently interprets basic diagnostic tests accurately * Needs limited assistance to understand the concepts of pre-test probability and test performance characteristics * Fully understands the rationale and risks associated with common procedures | * Interprets complex diagnostic tests accurately while accounting for limitations and biases * Knows the indications for, and limitations of, diagnostic testing and procedures * Understands the concepts of pre-test probability and test performance characteristics * Teaches the rationale and risks associated with common procedures and anticipates potential complications of   procedures | * Anticipates and accounts for subtle nuances of interpreting diagnostic tests and procedures * Pursues knowledge of new and emerging diagnostic tests and procedures |
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| **Comments:**  **Not Applicable** | | | | |

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| **17. Scholarship – Medical Knowledge 3** | | | | |
| Level 1 | Level 2 | Level 3 | Level 4 | Level 5 |
| * Has foundational understanding of scientific inquiry and scholarly productivity * Beginning to develop the skills necessary to effectively disseminate knowledge in the subspecialty | * Performs a literature search using relevant scholarly sources to identify pertinent articles * Is aware of basic statistical concepts, conditionally identifies methodological flaws * Communicates fundamental details of scientific work, including his or her own scholarly work; working towards consistent presentational skills * Begins to engage in critical thinking regarding clinical practice, quality improvement, patient safety, education, or research | * Identifies areas worthy of scholarly investigation and formulates a plan under supervision of a mentor * Critically reads scientific literature and identifies major methodological flaws and inconsistencies within or between publications * Understands and is able to apply basic statistical concepts, and can identify potential analytic methods for data or problem assessment * Effectively presents at journal club, quality improvement meetings, clinical conferences, and/or is able to effectively describe and discuss his or her own scholarly work or research | * Formulates ideas worthy of scholarly investigation * Collaborates with other investigators to design and complete a project related to clinical practice, quality improvement, patient safety, education, or research * Critiques specialized scientific literature effectively * Dissects a problem into its many component parts and identifies strategies for solving * Uses analytical methods of the field effectively * Presents scholarly activity at local or regional meetings, and/or submits an abstract summarizing scholarly work to regional/state/ national meetings, and/or publishes non-peer- reviewed manuscript(s) (reviews, book chapters) | * Independently formulates novel and important ideas worthy of scholarly investigation * Leads a scholarly project advancing clinical practice, quality improvement, patient safety, education, or research * Obtains independent research funding * Critiques specialized scientific literature at a level consistent with participation in peer review * Employs optimal statistical techniques * Teaches analytic methods in chosen field to peers and others * Effectively presents scholarly work at national and international meetings * Publishes peer-reviewed manuscript(s) containing scholarly work (clinical practice, quality improvement, patient |

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| **Comments:**  **Not Applicable** | | | | |