

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

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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
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**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
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**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** |