



UCNS Neuro-oncology 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

1. Systems thinking, including cost- and risk-effective practice – Systems-based Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Identifies and describes the roles of other team members. Identifies obvious or critical causes of error. 	<ul style="list-style-type: none"> Minimizes unnecessary diagnostic and therapeutic tests. Advocates for cost-conscious utilization of resources. Reports system errors that contribute to patient safety. 	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Leads quality assurance or improvement activities. Initiates care delivery models to mitigate barriers to cost-effective and high-quality care. 	<ul style="list-style-type: none"> Mentors others in quality improvement activities. Mentors others in developing care delivery models.
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Comments: Not Applicable <input type="checkbox"/>				

2. Self-directed learning – Practice-based Learning and Improvement				
<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> Engages in self-reflection when asked to do so. Responsive to feedback when offered. 	<ul style="list-style-type: none"> Welcomes unsolicited feedback. Engages in self-reflection routinely. Receptive to feedback from multiple sources. 	<ul style="list-style-type: none"> Recognizes sub-optimal performance as an opportunity for self-improvement. Consistently incorporates feedback in learning plan. 	<ul style="list-style-type: none"> Demonstrates proficiency in reconciling disparate or conflicting feedback. Continuously self-reflects and incorporates self-improvement opportunities to maximize practice improvement. Seeks 360-degree feedback. 	<ul style="list-style-type: none"> 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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3. Compassion, integrity, accountability, and respect for self and others – Professionalism				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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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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
<ul style="list-style-type: none"> • Demonstrates ability to discuss common ethical principles and identify ethical issues in practice. 	<ul style="list-style-type: none"> • Consistently displays responsiveness to patients that supersedes self-interest. 	<ul style="list-style-type: none"> • Analyzes and manages ethical issues in straightforward clinical situations. 	<ul style="list-style-type: none"> • Analyzes and manages ethical issues in complex clinical situations. 	<ul style="list-style-type: none"> • Demonstrates leadership and mentorship in applying ethical principles. • Active participant on hospital ethics committee.
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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
<ul style="list-style-type: none"> • Develops a therapeutic relationship with patients in uncomplicated situations. • Actively participates in team-based care. 	<ul style="list-style-type: none"> • Manages simple patient/ family related conflicts. • Engages patients in shared decision making. • Consistently demonstrates respect for all team members. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Manages conflict across specialties and systems of care. • Leads team-based patient care activities. 	<ul style="list-style-type: none"> • Engages in scholarly activity regarding teamwork and conflict management. • Is proficient in crucial conversations.
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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
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Effectively gathers information from collateral sources when necessary. • Demonstrates synthesis, formulation, and thought process in documentation. • Demonstrates effective non-verbal communication skills. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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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7. Research and other scholarly activity				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Reads subspecialty-scientific literature. 	<ul style="list-style-type: none"> • Critically evaluates and presents results of published research in the subspecialty at journal club or in a similar setting. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Designs and initiates original research in field of the subspecialty. • Develops an educational curriculum in the subspecialty. 	<ul style="list-style-type: none"> • Publishes original peer-reviewed research. • Serves as a research mentor.
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8. Neurological Assessment and Diagnosis – Patient Care 1				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Performs an oncology-relevant history, physical, and neurological examination. • Recognizes abnormalities of brain imaging. 	<ul style="list-style-type: none"> • Recognizes signs of, and initiates work-up for, neurological deterioration in neuro-oncology patients. • Provides differential diagnosis of brain or spine mass with direct supervision. • Diagnoses neurologic conditions associated with brain or spinal cord tumors with assistance. • Recognizes indications for advanced imaging and other diagnostic studies in tumor evaluation. 	<ul style="list-style-type: none"> • Provides differential diagnosis of brain or spine masses with indirect supervision. • Provides age-appropriate considerations to the differential diagnosis and evaluation plan. 	<ul style="list-style-type: none"> • Independently assesses the neurological function of any individuals of any age and any brain tumor condition and correlates with brain imaging. • Independently interprets diagnostic imaging and provides a differential diagnosis of brain or spinal masses. • Independently applies appropriate diagnostic methods in neuro-oncology, including clinical history and examination, laboratory, neuroimaging, neuropathologic, and other neurodiagnostic procedures in the evaluation. 	<ul style="list-style-type: none"> • Mentors learners in obtaining an oncology-relevant history, physical, and neurological examination.
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9. Treatment and Management – Patient Care 2				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Directs management of patients with neurologic emergencies with direct supervision. • Understands principles of chemotherapy and recognizes toxicities caused by chemotherapeutic and systemic treatment agents. 	<ul style="list-style-type: none"> • Formulates a work-up and treatment plan for patients with brain, skull base, or spinal cord tumors. • Recommends a comprehensive evidence-based treatment plan. • Demonstrates diligence in follow-up of patients' ongoing treatment, including ongoing decision-making based on lab/imaging/other test results. • Describes the role of palliative care for patients with neuro-oncologic illness. • Recognizes clinical dilemmas in the care of patients with neuro-oncologic illness and situations in which an ethics consultation is necessary. • Discusses systemic and chemotherapeutic plans, risks, benefits, 	<ul style="list-style-type: none"> • Identifies and systematically manages cancer-related neurologic disorders. • Demonstrates critical thinking in formulating targeted differential diagnosis, and succinctly communicate a pertinent HPI and differential to colleagues. • Recognizes opportunities to minimize or prevent complications associated with medical, diagnostic, radiological, and surgical procedures in patients with brain, skull base, or spinal cord tumors. • Identifies and manages toxicities/symptoms seen in patients treated with surgery, radiotherapy, and systemic therapies. 	<ul style="list-style-type: none"> • Independently directs management of patients with neurologic emergencies. • Independently integrates palliative care when necessary in the management of patients with neuro-oncologic illness. • Independently formulates a treatment plan for patients with comorbidities or other medical complications (e.g., systemic illness, radiation, chemotherapy). • Incorporates developmental and psychosocial contexts and knowledge of non-neurologic organ systems in developing differential diagnosis and treatment. • Independently prescribes systemic agents and manages 	<ul style="list-style-type: none"> • Leads an interdisciplinary team in managing patients with neurologic emergencies. • Demonstrates sophisticated knowledge of treatment subtleties and controversies in uncommon types of brain tumor and related disorders. • Discusses and provides advanced and experimental therapeutic agents, discuss their risks, benefits, alternatives, and manages all potential complications in experimental clinical trials.

	and alternatives with supervision. • Understands the uses, limitations, and toxicities of radiation therapy.	• Provides age-appropriate treatments. • Determines and prescribes appropriate chemotherapies and dosages.	related toxicities/complications.					
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10. Consultative Care – Patient Care 3				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> Requests consultations from a neurologic subspecialist or other specialty for additional evaluation or management under attending physician's guidance. 	<ul style="list-style-type: none"> Provides consultations to a neurologic subspecialist or other specialty for additional evaluation or management under attending physician's guidance. Asks meaningful clinical questions that guide the input of consultants. Communicates assessment and recommendations to the specialty team requesting the consultation. Appropriately integrates recommendations from other consultants in order to effectively manage patient care. Presents appropriate neuro-oncologic history, examination findings and diagnostic results to guide multidisciplinary treatment plans. 	<ul style="list-style-type: none"> Provides consultations to a neurologic subspecialist or other specialty for additional evaluation or management with a greater degree of independence. Collaborates with other oncology specialists to identify and manage toxicities/symptoms seen in patients treated with surgery, radiotherapy, and systemic therapies. Provides consultation for patients with basic and complex clinical problems requiring detailed risk assessment. Determines treatment plans in a multidisciplinary team setting with supervision. 	<ul style="list-style-type: none"> Serves as an expert consultant in incorporating tumor biology, immunology, anatomy or physiology into patient care. Independently utilizes medical neuro-oncologic therapeutics, including appropriate chemotherapy, targeted and novel therapies, and therapy for commonly associated medical complications in pediatric and adult neuro-oncology patients Independently provides or directs comprehensive multidisciplinary team treatment plans for any individuals of any age and brain or spine tumor condition. 	<ul style="list-style-type: none"> Provides consultation services for other healthcare team members and for patients with very complex clinical problems requiring extensive risk assessment. Effectively mitigates discordant recommendations from multiple consultants and discusses risks, benefits, and alternatives of each recommendation to reach a comprehensive treatment plan for any individuals of any age and condition.

	<ul style="list-style-type: none"> Summarizes and discusses multidisciplinary treatment plans with supervision in medical records and to patients. 							
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11. Management of Primary Nervous System Tumors – Medical Knowledge 1				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Demonstrates comprehensive knowledge in various manifestations of primary nervous system tumors and related complications. • Demonstrates the knowledge of the basic principles of neuropathology, common pathological diagnosis and therapies, and the indications for and common complications of drugs. • Demonstrates understanding of the basic principles and the ethical conduct of experimental clinical trials. 	<ul style="list-style-type: none"> • Develops in-depth knowledge in treatment of primary nervous system tumors. • Describes the radiological and clinical features of CNS tumors. • Explains risks and benefits of neurosurgical procedures, radiation and chemotherapy for brain and spinal cord tumors. • Demonstrates knowledge of the mechanisms of action and pharmacokinetics of cytotoxic chemotherapy agents, targeted therapies and cancer immunotherapy. • Demonstrates knowledge of genetic markers that impact prognosis. • Demonstrates critical review of the literature as it pertains to patient care. 	<ul style="list-style-type: none"> • Describes the genetics of brain tumors and genetic markers that impact prognosis. • Describes the risks, screening, incidence, and management of late effects from chemotherapy and radiation. • Applies knowledge in use of blood products and growth factor support, and neuro-oncologic complications of bone marrow transplantation. • Applies knowledge of treatment related changes to interpretation of neuroimaging and patient management. • Describes acute and chronic complications associated with cytotoxic chemotherapy agents, targeted therapies and cancer immunotherapy. 	<ul style="list-style-type: none"> • Demonstrates comprehensive knowledge of the psychological aspects of the patient-physician relationship, and the importance of personal, social, and cultural factors in disease processes and their clinical expression. • Independently utilizes medical neuro-oncologic therapeutics, including appropriate chemotherapy, targeted and novel therapies, and therapy for commonly associated medical complications in pediatric and adult neuro-oncology patients. • Critically utilizes the results of clinical trials and published guidelines in clinical practice. • Independently able to assess and manage patients of any age on 	<ul style="list-style-type: none"> • Independently utilizes and educates healthcare team members about medical neuro-oncologic therapeutics, including appropriate chemotherapy, targeted and novel therapies, and therapy for commonly associated medical complications in pediatric and adult neuro-oncology patients. • Independently develops and initiates therapeutic experimental protocols.

	<ul style="list-style-type: none"> • Demonstrates the ability to evaluate appropriate patients for enrollment into clinical trials. 	<ul style="list-style-type: none"> • Demonstrates knowledge in clinical trial designs and appropriate objectives and endpoints in therapeutic protocols. • Demonstrates knowledge of the epidemiology of primary CNS tumors. 	experimental therapeutic protocols.					
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Comments:								Not Applicable <input type="checkbox"/>

12. Metastatic Cancer to the Nervous System – Medical Knowledge 2				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Demonstrates comprehensive knowledge in various manifestations of metastatic cancer to the nervous system. 	<ul style="list-style-type: none"> • Develops in-depth knowledge in treatment of metastatic cancer to the nervous system. • Describes the radiological and clinical features of metastatic cancer to the nervous system. • Explains risks and benefits of neurosurgical procedures, radiation and chemotherapy for brain and spinal cord metastases. 	<ul style="list-style-type: none"> • Describes the risks, screening, incidence, and management of late effects from chemotherapy and radiation. • Applies knowledge of treatment related changes to interpretation of neuroimaging and patient management. • Describes acute and chronic complications associated with cytotoxic chemotherapy agents, targeted therapies and cancer immunotherapy. 	<ul style="list-style-type: none"> • Independently utilizes medical neuro-oncologic therapeutics, including appropriate chemotherapy, targeted and novel therapies, and therapy for commonly associated medical complications in neuro-oncology patients or as they apply to pediatric and adult neuro-oncology. 	<ul style="list-style-type: none"> • Independently utilizes and educates healthcare team members about medical neuro-oncologic therapeutics, including appropriate chemotherapy, targeted and novel therapies, and therapy for commonly associated medical complications in pediatric and adult neuro-oncology patients.
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13. Cancer-related Neurologic Disorders – Medical Knowledge 3				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> • Demonstrates comprehensive knowledge in various manifestations of cancer-related neurologic disorders. • Demonstrates the knowledge of the basic principles of toxic, nutritional and metabolic encephalopathy. 	<ul style="list-style-type: none"> • Develops in-depth knowledge in cancer-related neurologic disorders, CNS and systematic infections. • Explains risks of neurological complications associated with neurosurgical procedures, radiation and chemotherapy. • Demonstrates knowledge of the mechanisms of action of therapeutics used in palliative and end-of-life care. 	<ul style="list-style-type: none"> • Describes the risks, screening, incidence, and management of late effects from chemotherapy and radiation in cancer-related neurologic disorders. • Advances knowledge in use of blood products and growth factor support, and neuro-oncologic complications of bone marrow transplantation. • Describes acute and chronic complications associated with cancer-related neurologic disorders. 	<ul style="list-style-type: none"> • Demonstrates comprehensive knowledge of the psychological aspects of the patient-physician relationship, and the importance of personal, social, and cultural factors in disease processes and their clinical expression. • Independently utilizes medical neuro-oncologic therapeutics, including appropriate chemotherapy, targeted and novel therapies, and therapy for commonly associated medical complications in neuro-oncology patients or as they apply to in cancer-related neurologic disorders. • Independently manages patients during survivorship and at the end of life. 	<ul style="list-style-type: none"> • Independently utilizes and educates healthcare team members about medical neuro-oncologic therapeutics, including appropriate chemotherapy, targeted and novel therapies, and therapy for commonly associated medical complications in neuro-oncology patients or as they apply to in cancer-related neurologic disorders. • Consistently demonstrates sophisticated knowledge of cancer-related neurologic disorders and educate trainees in the clinical learning environments.
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Comments:

Not Applicable