



ADVANCED PRACTICE PROVIDER ORIENTATION COURSE

Overview

The Advanced Practice Provider (APP) Orientation Course is a resource designed for APPs and healthcare professionals working in the field of neurocritical care. It includes organized resources covering a wide variety of foundational content (neuroanatomy, neuroradiology, and the in-depth neurological examination) as well as disease-specific content for a wide variety of diagnoses encountered in Neurocritical Care. Each topic outlines required foundational content as well as suggested resources for APPs looking for a deeper understanding on neurocritical care content.

Course Structure

This course is comprised of 4 module sections that include review materials for a subset of topic areas. Suggested competencies are included, with mandatory review materials and optional resources. After reviewing all mandatory materials, participants will receive a certificate of completion.

Module Sections

This course includes sections on Neurology Foundations, Critical Care Foundations, Procedures, and Pathology and Disease in Neurocritical Care. Detailed information on the topics and suggested competencies for each module are included in the following pages.

Pricing Options

APP ORIENTATION COURSE PURCHASE OPTIONS

BUNDLE OPTIONS	PRICE	BUNDLE INCLUDES
Bundle #1	NCS Member: \$269.00 Non-Member: \$331.50	<ul style="list-style-type: none">• Pharmacy Orientation Course• Subscription to Neurocritical Care ON CALL• Hard copy of The Pocket Guide to Neurocritical Care
Bundle #2	NCS Member: \$389.00 Non-Member: \$479.00	<ul style="list-style-type: none">• All items included in Bundle #1• Emergency Neurological Life Support (ENLS) - eligible for 15 CE credits upon completion
Bundle #3	NCS Member: \$499.00 Non-Member: \$649.00	<ul style="list-style-type: none">• All items included in Bundle #1• An additional 28.25 CE credits upon completion of associated exams
Bundle #4	NCS Member: \$619.00 Non-Member: \$769.50	<ul style="list-style-type: none">• All items included in Bundle #1• Emergency Neurological Life Support (ENLS) - eligible for 15 CE credits upon completion• An additional 28.25 CE credits upon completion of associated exams

Module 1: Neurology Foundations

Topics:

- Neuroanatomy
- Neuro Exam and Localization – ICU Neuro Exam
- Neuroradiology (CT/MRI/TCD Interpretation)

Suggested Competencies

- ✓ Describe the anatomy of the brain and spinal cord, identifying major external and internal structures, coverings and fluid-filled spaces, and accurately localizing to specific region of injury
- ✓ Describe the anatomy of the brainstem, and demonstrating knowledge of specific functions
- ✓ Identify and describe the function of the cranial nerves
- ✓ Illustrate cerebral arterial and venous vascular anatomy supply
- ✓ Performs a detailed neurologic exam on an awake and oriented patient
- ✓ Performs a detailed neurologic exam on patients with varying levels of consciousness, including the comatose patient
- ✓ Perform rapid assessment and focused exam in neurologic emergency situations
- ✓ Differentiate different types of neuroimaging modalities, selecting appropriate image technique for diagnosis and assessment of neurological injury.

Module 2: Critical Care Foundations and Neurocritical Care Skills

Topics:

- Advanced Hemodynamics
- Cerebral Hemodynamics and Herniation Syndromes
- Multimodality Neuromonitoring
- Airway and Ventilation Management

Suggested Competencies

- ✓ Interpret measurement of systemic, pulmonary arterial and venous pressures, and of cardiac output
- ✓ Justify indications for invasive hemodynamic monitoring
- ✓ Describe stress induced cardiomyopathy, EKG abnormalities, and arrhythmias seen in neurogenic cardiac injury
- ✓ Interpret measurements of cerebral perfusion, intracranial pressure, and brain oxygen monitoring
- ✓ Recognize both clinical and hemodynamic changes seen in two patients at risk for herniation
- ✓ Illustrate appropriate treatment algorithm utilized for cerebral herniation
- ✓ Describe the role of TCD ultrasonography with a focus on vasospasm monitoring in a patient with aneurysmal SAH
- ✓ Analyze ICP waveforms and interpret cerebral compliance
- ✓ Summarize appropriate interventions to implement with a non-patent EVD
- ✓ Identify disease specific considerations with intubation in neurologic injury
- ✓ Summarize warning signs of neuromuscular respiratory failure
- ✓ Compare modes of ventilation and weaning parameters in patients with neurologic injuries

Module 3: Pathology and Disease in Neurocritical Care

Topics:

- Subarachnoid Hemorrhage
- Intracerebral Hemorrhage
- Ischemic Stroke
- Meningitis and Encephalitis
- Seizure and Status Epilepticus
- Traumatic Brain Injury
- Spinal Cord Injury and Compression
- Resuscitation Post Cardiac Arrest- TTM
- Coma
- Metabolic Encephalopathy
- Paroxysmal Sympathetic Hypersensitivity (PSH)
- Toxidromes
- Brain Death
- Neuromuscular Disease
- Neuroendocrine Disorders
- Neuropharmacology- Sedation and Analgesia
- Ethics and Prognostic Assessment

Suggested Competencies

- ✓ Manage one patient presenting with SAH and hypertension, with a focus on pre-aneurysm securement
- ✓ Manage one patient presenting with coagulopathy related ICH, applying appropriate pharmacological reversal agents
- ✓ Manage two patients with AIS syndromes, providing rapid evaluation and determination of eligibility for acute stroke interventions, including pharmacologic treatments and endovascular approaches
- ✓ Manage two patients with AIS, providing a detailed neurological exam with a focus on localization of stroke symptoms and common clinical presentations of large vessel occlusions
- ✓ Manage one patient presenting with AIS who received IV alteplase and developed hemorrhagic transformation within 24 hours, with a focus on appropriate reversal of IV alteplase

- ✓ **Manage one patient presenting with AIS who develops malignant cerebral edema, with a focus on medical management with hyperosmolar therapies and decompressive hemicraniectomy**
- ✓ **Interpret CSF profiles for bacterial meningitis, viral meningitis, herpes encephalitis, and subarachnoid hemorrhage**
- ✓ **Prescribe antibiotics for suspected meningitis based on patient characteristics**
- ✓ **Identify first and second line AEDs for utilization in critical care environment, understanding dosing and adverse effects**
- ✓ **Manage one patient in status epilepticus with appropriately selection and up titration of anti-epileptic drugs**
- ✓ **Justify the role of continuous electroencephalographic (cEEG) monitoring in a patient presenting with status epilepticus. Differentiate between common vasoactive agents used in NCC to maintain blood pressure, identifying advantages and disadvantages of each agent**
- ✓ **Summarize common analgesic medications used to control pain, including possible adverse effects of these medications**
- ✓ **Determine medications used for induction of rapid sequence intubation**
- ✓ **Evaluate non-contrasted head CT on two patients presenting with TBI, identifying presence of subdural or epidural hemorrhage**
- ✓ **Manage one TBI patient with a focus on ICP management**
- ✓ **Summarize the Canadian C-Spine Rule and/or NEXUS Criteria and need for further cervical spine imaging**
- ✓ **Summarize the ASIA/ISCoS Exam and Grade on a patient presenting with spinal cord injury, anticipating rehabilitation and recovery needs**
- ✓ **Demonstrate cervical spine stabilization and clearance of cervical collar**
- ✓ **Describe the neurologic benefit of temperature management in the post cardiac arrest patient population**
- ✓ **Compile a list of physiologic changes and potential side effects/complications associated with TTM**
- ✓ **Identify methods of shivering management during TTM**
- ✓ **Manage two patients undergoing TTM, identifying appropriate timeline of neurologic prognostication techniques and participate in neuro prognostication discussions following cardiac arrest**
- ✓ **Differentiate between coma, persistent vegetative state, and locked-in-syndrome.**

- ✓ Identify potentially reversible metabolic, toxic, and neurologic causes of coma
- ✓ Summarize common etiologies of metabolic encephalopathy
- ✓ Manage one patient with acute metabolic encephalopathy, with a focus on laboratory investigation and interpretation
- ✓ Describe the proposed pathophysiology of PSH
- ✓ Identify common causes of PSH
- ✓ Summarize symptomatology and pharmacologic treatment strategies for the management of PSH Perform one brain death evaluation with clinical team, including clinical exam and apnea test
- ✓ Summarize the role of ancillary testing in the determination of brain death
- ✓ Manage one patient with a Neuromuscular disease
- ✓ Determine the indications for intubation of a patient with acute neuromuscular respiratory failure
- ✓ Summarize treatment of MG and/or GBS and what factors contribute to the decision of IVIG vs Plasmapheresis
- ✓ Manage a patient with hyponatremia, based on laboratory investigation and clinical presentation, differentiate between SIADH and CSW with appropriate treatment algorithm
- ✓ Summarize potential causes of Central DI and based on laboratory investigation, manage a patient in DI
- ✓ Plan for a family meeting involving surrogate decision-makers
- ✓ Describe the shared decision-making process for a family meeting
- ✓ Describe challenges and pitfalls in neuro-prognostication and self-fulfilling prophecy
- ✓ Identify a toxidrome classification based on a constellation of clinical examination findings
- ✓ Manage a patient with at least one toxidrome

Module 4: Recommended Procedures in the Neurocritical Care Environment

Topics:

- Recommended Procedures in the Neurocritical Care Environment
- Bedside Ultrasound

Suggested Competencies

- ✓ Demonstrate the following to hospital preceptor or program director:
 - Arterial line placement
 - Midline placement
 - Peripherally Inserted Central Catheter (PICC) placement
 - Central line placement (subclavian, internal jugular, femoral vein)
 - Lumbar puncture
 - Lumbar drain
 - Bronchoscopy
 - Endotracheal intubation and insertion of artificial airway
 - Chest tube placement
 - Intracranial device insertion (ventriculostomy, intraparenchymal catheter, jugular bulb placement, PbO₂ sensor probe)
- ✓ Utilize bedside ultrasound to assess the following:
 - Volume status/fluid responsiveness – IVC
 - Optic nerve sheath diameter
 - Cardiac: EF, pericardial effusion, tamponade
 - Lung: pleural effusions, pulmonary edema, pneumothorax
 - Line placement