THE COMPETENCY-BASED LONGITUDINAL CORE CURRICULUM IN MEDICAL NEUROSCIENCE

A. Medical Knowledge

MK1. Describe the normal development of the nervous system, and list the various disorders of neuronal development and fetal maturation that can occur (leukodystrophies, heterotopias, congenital malformations of skull & brain or spine & spinal cord).

MK2. Describe mechanisms of remodeling of the nervous system during development and following neural injury.

MK3. Describe contribution of somatic and mitochondrial genetic disorders to major neurologic diseases, including triplet repeat expansions; describe epigenetic mechanisms that contribute to neurologic diseases.

MK4. Recognize clinical impact of disordered cerebral homeostasis (CSF, blood-brain barrier, brain metabolism).

MK5. Distinguish normal cellular elements of the nervous system from tumor pathology based on histologic features.

MK6. Describe various aspects of molecular and cell biology of neural tissue as they pertain to the underlying pathophysiology of nervous system diseases and the mechanism of action of neurotherapeutic agents.

MK7. Localize neurologic deficits to the most likely sites in the central and/or peripheral nervous system based on mastery of functional neuroanatomy (function of structures, tracts, and nuclei in brain and spinal cord; vascular territories; cranial nerves and skull foramina; spinal roots, plexi, nerves, and muscles; autonomic and enteric nervous systems).
MK8. Identify major nervous system diseases based on gross and microscopic pathology, clinical features, and/or associated CSF findings, comparing and contrasting each of these with their normal counterparts.

MK9. Describe pathophysiology of major diseases resulting from aberrant central and peripheral neurophysiological function (e.g. stupor and coma, epilepsy, movement disorders, sleep disorders, demyelinating diseases, disordered neuromuscular transmission, muscle diseases, channelopathies, neuropathies); explain how EEG, EMG, nerve conduction studies and/or repetitive stimulation studies can aid in diagnosis based on underlying mechanisms of these disturbances.

MK10. Identify neural mechanisms (anatomy, physiology and pharmacology) of attention, consciousness, sleep, emotion, memory, language, praxis, visuospatial function, and other higher cortical functions; describe clinical disturbances related to each.

MK11. Describe clinical features of disturbances in neuroendocrinology and neuroimmunology; explain underlying pathophysiology of these clinical presentations.

MK12. Describe mechanisms of action of neuropharmacological agents, both therapeutic and toxic, that act at CNS, PNS, or ANS; list their indications, contraindications, and major side effects. Be familiar with non-pharmacologic and complementary medicine approaches to treatment of major neurologic disorders.

B. Patient Care:

PC1. Demonstrate competence in the bedside clinical assessment of the nervous system by obtaining a relevant history and performing a complete
neurological examination, including special maneuvers as indicated (meningeal signs, Dix-Hallpike, straight leg raising).

PC2. Delineate the steps one would take to evaluate patients with common neurologic symptoms (e.g. dizziness, visual disturbance, numbness, weakness, balance problem, headache). Specify aspects of history, physical findings, and workup that would help localize and distinguish among diagnostic possibilities.

PC3. Localize symptoms and signs obtained above appropriately and generate a differential diagnosis based on both likelihood and potential treatability of the condition, and thereby determine the appropriate workup and initial management for the patient (bloodwork, CSF, radiologic, and/or electrophysiologic).

PC4. Interpret workup results to determine most likely diagnosis for major, common, or most treatable neurologic diseases. The “major categories” include: infectious, inflammatory and immunologic; traumatic and mechanical; neoplastic; toxic, metabolic, nutritional and regulatory; vascular; congenital/developmental; degenerative; paroxysmal (including pain syndromes); psychopathologic; sleep disorders; and disorders of consciousness.

PC5. List the diagnostic criteria for major neurologic diseases or conditions (e.g. dementia, Parkinson’s disease, multiple sclerosis, epilepsy).

PC6. Using pathophysiologic and epidemiologic knowledge of common neurological diseases or conditions, appropriately outline an evidence-based initial treatment plan which takes into account cultural factors and context.
PC7. Diagnose common disorders affecting the special senses (hearing, vision).

PC8. Identify neurologic emergencies by bedside assessment (history and physical exam) and initiate emergency workup and management (such as immediate referral to ER, immediate consultation with neurologist, ophthalmologist and/or neurosurgeon; radiologic studies, laboratory studies, lumbar puncture, pulmonary function tests/vital capacity; immediate admission to critical care setting).

PC9. Participate as a contributing member of the clinical neurology team in all settings (inpatient, outpatient, and emergency room); participate in the evaluation and care of a minimum number and variety of neurologic patients.

PC10. Describe anatomy of spinal cord within spinal canal and proper technique used to perform lumbar puncture safely; list indications and contraindications for LP.

C. Interpersonal and Communication Skills

ICS1. Present patient data, orally and in writing, in an organized coherent concise fashion, summarizing the pertinent positive and negative features of the history and physical exam to support the concluding localization and differential diagnosis.

ICS2. Interact with patients, colleagues, and staff in a respectful, empathic, and constructive manner.

ICS3. Communicate effectively with patients and their families regarding diagnosis, workup and treatment (this includes informed consent for LP as well as ethical issues such as genetic testing, end-of-life care, brain death and organ donation)
ICS4. Communicate effectively with team members to exchange information for patient care.

D. Practice-Based Learning and Improvement

PBLI1. Utilize current resources (journals and appropriate websites) to keep abreast of recent developments that may assist in the workup and management of patients, or may broaden understanding of the pathophysiologic underpinnings of their disease processes.

PBLI2. Demonstrate willingness and ability to learn from mistakes.

E. Systems-Based Practice

SBP1. Interact with consultants and allied health professionals (physician extenders, social workers) as indicated to benefit patient care and to ensure patient safety within the hospital as well as in the home setting.

SBP2. Recognize impact of financial, ethnic, linguistic, organizational, and other social factors on patient care both locally and globally.

F. Professionalism

P1. Attend to duties responsibly, promptly, and ethically; complete all course requirements in a timely fashion.

P2. Demonstrate honesty and integrity in all interactions with peers, faculty, and staff.

P3. Exhibit respectful, responsible, and ethical behavior toward patients and their families.

P4. Exhibit compassionate treatment of patients and respect for their privacy and dignity.