Department of Critical Care Medicine
Neurocritical Care Rotation

Description:
The neurocritical care (NCC) rotation is designed to introduce trainees to individualized, precision-guided, evidence-based, NCC. Trainees will deepen their knowledge and skills, via exposure to patients with a variety of disorders including post cardiac arrest, neuro-trauma (TBI & SCI), neuro-vascular disorders (SAH, ICH, IS), refractory and super-refractory status epilepticus, among others. Focus will be placed on understanding precision-guided, evidence-based management of patients with neurological emergencies; pathophysiology, detection (via multimodal neuromonitoring) and prevention/management of secondary brain injury; neuroprognostication and related considerations; death by neurologic criteria; and organ donation.

Trainees will integrate into the NCC team comprised on three staff neurointensivists, the NCC fellow and/or NCC nurse practitioner. They will also have the opportunity to work with the on call SEND physician on an ad hoc basis. Trainee responsibilities will be comprised of both clinical and educational NCC consults, presenting 1-2 agreed upon NCC talks (e.g. case presentation, journal club, topic review, etc.) and completion of educational assignments based on learning objectives.

Duration: 1 block
- NOTE: Flexibility exists within the rotation to allow for scheduling of other learning opportunities that may be available through one's home training program (e.g. periodic half days of clinic, research responsibilities, etc.). The rotation will also honor any and all educational sessions scheduled by the trainees home program.

Requirements:
The NCC rotation is distinct from a neurotrauma ICU (i.e. FMC C pod) rotation and is NOT considered a substitute. The rotation is open to trainees from any training background (e.g. critical care, neurology, neurosurgery, stroke, neuroanesthesia, etc.) who are interested in learning the about aforementioned topics due to a relevance to their future careers. Interested trainees must:
- be post-graduate year 3 or above AND
- have completed their training program's ICU requirements

The rotation can only accommodate one trainee at a time. Interested trainees should contact Dr. Julie Kromm a minimum of 4 months in advance of their desired block to discuss their interest and personal objectives informed by career goals. Based on objectives and the NCC schedule a rotation outline will be created for approval by the trainees program director, then shared with the NCC service in advance.

General Objectives:
In addition to learning about precision-guided, evidence-based management of specific neurological emergencies, trainees must indicate an area of focus that includes one or both of the following:

1) Neuroprognostication, Death by Neurologic Criteria, and Organ/Tissue Donation Considerations
   By the end of the rotation, trainees choosing this area of focus will
   - Define and understand the concept and importance of the self-fulfilling prophecy.
   - Review commonly used neuroprognostication scores and be able to describe their utility and limitations.
   - Understand and apply a multimodal approach to neuroprognostication including:
     - Review and exclusion of confounders

        - Clinical assessment comprised of pertinent historical details and examination findings
        - Describing supporting evidence, indications, logistical considerations, and limitations of pertinent investigations including
            - Neuroimaging modalities: CT, MR, etc.
            - Electrophysiological modalities: EEG, evoked potentials, event related potentials, etc.
            - Chemical biomarkers
    - Understand and declare death by neurologic criteria.
    - Review other clinical considerations surrounding neuroprognostication including but not limited goals of care, breaking bad news, organ/tissue donation considerations, etc.

2) Multimodal Neuromonitoring
   By the end of the rotation, trainees choosing this area of focus will
    - Comprehend and apply knowledge regarding neurophysiology as it pertains to the use of multimodal neuromonitoring in the management of NCC conditions including but not limited to:
        - Monro-Kelly Doctrine, Intracranial Compliance and Intracranial Pressure
        - Cerebral Perfusion Pressure
        - Cerebral Blood Flow
            - Flow-Metabolic Coupling
            - Cerebral Autoregulation
        - Fick Principle
        - Cerebral Metabolism
            - Aerobic
            - Anaerobic
        - CSF production, circulation and absorption
    - Understand and apply the physiologic basis, indications, contraindications, limitations, placement/location, technology, interpretation and removal/discontinuation of the following invasive and non-invasive monitoring techniques
        - ICP monitoring
            - Invasive – intraparenchymal and intraventricular monitors
            - Non-invasive – optic nerve sheath diameter measurements, TCD
        - Autoregulation monitoring
        - Cerebral oxygenation monitoring
            - Invasive - PbtO2 monitors, jugular oximetry
            - Non-invasive - regional oximetry
        - Cerebral blood flow monitoring
            - Thermal diffusion flowmetry
            - TCD
        - Electrophysiology
        - Cerebral microdialysis

Assessment:
A summative ITAR will be completed by NCC team members and SEND physicians based on the trainees NCC consults, presentations and assignments.

Contact:
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