ROTATION DESCRIPTION

ROTATION TITLE
Neurosurgery (PGY2)

PURPOSE
The neurosurgery rotation provides the opportunity for the PGY2 resident to refine their knowledge base and pharmacotherapeutic skills while optimizing care for critically ill patients. The resident will assume patient care responsibility, demonstrate mastery of pharmacotherapy for the most commonly encountered neurological diseases and explore pharmacotherapy for those that are less frequent, comprehensively review major guidelines and critically evaluate landmark trials, and assume responsibility in the education of team members.

LEARNING EXPERIENCE DESCRIPTION
This rotation will provide exposure to various surgical and medical neurological diseases. The pharmacy resident is expected to provide comprehensive pharmaceutical care for the neurocritical care team, including prospective drug utilization review, recommendations to optimize pharmacotherapy, and coordinating pharmaceutical services when deemed necessary. In addition, the resident is expected to serve as a pharmacy liaison to the neurosurgical step-down team and, at a minimum, check in daily with the medical intern/resident and/or physician extenders to assess the need for pharmacotherapy services and individually review medication profiles twice weekly for major pharmacotherapeutic concerns.

The neurocritical care team consists of a neurosurgeon(s), neurointerventionalist(s), neurointensivist(s), critical care pharmacist, critical care nurse(s), dietician, neurosurgery resident(s), and various medical students/interns/residents/fellows. The resident will spend five days a week with the neurocritical care team. The team begins at 0600 – 0630 AM in the neuro-intensive care unit for radiology rounds. Medical rounds, led by the neurointensivist, generally begin at 0800 – 0830 AM in the neuro-intensive care unit and can last until 1200 – 1300 PM. Afternoon check-out rounds begin at 1600 – 1700 PM in the neuro-intensive care unit conference room. The resident is expected to attend both radiology and medical rounds, while afternoon check-out rounds are not mandatory, but may be necessary at times to assist with continuity of care.

The preceptor will round with the resident several times the first week of rotation or until such time as the resident demonstrates and/or communicates that he/she is comfortable rounding solo. After that time, the preceptor will occasionally round with the resident if requested by the resident or the attending physician or if deemed necessary by the preceptor to provide appropriate patient care or to observe the resident's progress. However, the preceptor will be available to address any questions either being directly visible in the intensive care unit or immediately accessible via pager.

Residents will discuss patients briefly with the preceptor prior to rounds, if feasible, and in greater detail after rounds. The resident will lead or participate in topic discussions and literature evaluation at least twice weekly. When students are also on rotation, the resident will assist in supervision and education of the student, and will provide input for the student's evaluation.

LEARNING EXPERIENCE ACTIVITIES

The following activities are required during the neurocritical care rotation for a PGY1 pharmacy resident. Activities directly related to RLS objectives evaluated on this rotation are noted.

1. **Collect and interpret data to apply to patient care, including the following activities:**
   - **a.** Apply medical publications to evidence-based patient care.
     (CC R2.4.3; 2.5.1; 2.5.2; 2.6.1; E2.1.2; 2.1.3; 2.1.4; 2.1.5; 2.1.6; PCT R2.4.3; 2.6.1; 2.6.2; 3.1.9)
   - **b.** Interpret and integrate relevant subjective and objective information in disease state management.
     (CC R2.4.3; 2.4.4; 2.5.1; 2.5.2; 2.6.1; PCT R2.4.1; 2.4.2; 2.4.3; 2.6.1; 2.6.2)
   - **c.** Appropriately assess all drug information questions and formulate a timely, detailed, yet concise response.
     (CC E2.1.1; 2.1.2; 2.1.3; 2.1.6; 2.17; 3.1.3; PCT R3.1.9; 3.1.11)
   - **d.** Obtain or review a medication history for all patients being followed clinically.
     (CC R2.4.3; E1.3.1; 1.3.2; PCT R2.4.1; 2.4.3)
   - **e.** Review, monitor, and modify therapeutic regimens considering the following components: adherence, interactions, adverse drug reactions, efficacy, toxicity, appropriate drug and dosing, and duplicate therapy.
     (CC R2.4.3, 2.5.1; 2.5.2; 2.6.1; 2.9.1; 2.9.2; 2.9.3; PCT R2.4.2; 2.4.3; 2.6.1; 2.6.2; 2.11.1; 2.11.2)
   - **f.** Prepare and maintain a monitoring system for each patient, and use this tool to present a patient in a concise and organized manner.
     (CC R2.4.3; 2.9.3; PCT R2.4.1; 2.4.3)
   - **g.** Quickly assess and interpret appropriate information to effectively participate in medical emergencies, such as cardiac, respiratory, or brain codes.
     (CC R2.4.4; 5.1.1)

2. **Build and apply his or her fund of knowledge:**
   - **a.** Display understanding of the role of pharmacists in the institutional setting.
     (CC E2.1.1)
   - **b.** Apply knowledge of general principles involved with the management of critically ill patients. Clearly understand and discuss the following topics:
     (CC R2.4.3; 2.5.1; 2.5.2; 2.6.1; PCT R2.4.3; 2.6.1; 2.6.2)
     - **i.** Pharmacokinetics and pharmacodynamics
     - **ii.** Antibiotic management
     - **iii.** Venous thromboembolism prophylaxis and management
     - **iv.** Stress ulcer prophylaxis
     - **v.** Nutrition support
     - **vi.** Fluid, electrolyte, and acid/base management
     - **vii.** Pain, sedation, and paralytic management
     - **viii.** Vasoactive and intotropic medications
     - **ix.** Hemodynamic and physiologic principles
     - **x.** Ventilator principles

c. Apply knowledge of pathophysiology, signs and symptoms, diagnosis, and pharmacotherapy of specific disease states. Clearly understand and discuss at the following topics:
(CC R2.4.3; 2.5.1; 2.5.2; 2.6.1; PCT R2.4.3; 2.6.1; 2.6.2)

- **i.** Hospital acquired/ventilator associated pneumonia
- **ii.** Hypovolemic/cardiogenic/distributive shock
- **iii.** Multiorgan dysfunction syndrome
- **iv.** Spontaneous intracranial hemorrhage
- **v.** Subarachnoid hemorrhage
- **vi.** Ischemic stroke
- **vii.** Traumatic brain injury
- **viii.** Spinal cord injury
- **ix.** Cerebral salt wasting
- **x.** Syndrome of inappropriate diuretic hormone
- **xi.** Diabetes insipidus
- **xii.** Brain tumors
- **xiii.** Arteriovenous malformation
- **xiv.** Cerebral venous sinus thrombosis
- **xv.** Status epilepticus
- **xvi.** Meningitis/Ventriculitis
- **xvii.** Brain/Spinal abscess
- **xviii.** Neurosurgical antibiotic prophylaxis
- **xix.** Intracranial hypertension
- **xx.** Paroxysmal sympathetic storming
- **xxi.** Other pre-approved topic

d. Demonstrate technical drug knowledge including pharmacokinetics, mechanism of action, administration, adverse reactions, contraindications, interactions, and formulations.
(CC R2.4.3; 2.5.1; 2.5.2; PCT R2.4.3)

e. Understand patient safety initiatives as they apply to improving patient care.
(CC R1.2.1; 1.3.1; PCT R1.3.1; 1.3.2; 3.2.6)

3. Design and implement a pharmacotherapeutic plan:

a. Develop medication management plans to ensure positive patient outcomes, therapeutic endpoints, and cost-effectiveness.
(CC R2.4.3; 2.5.1; 2.5.2; 2.6.1; 2.8.2; PCT R2.4.3; 2.6.1; 2.6.2; 2.11.1; 2.11.2)

b. Implement a reasonable patient care plan using problem-solving skills, contacting health care professionals, following up as needed and reassessing plans.
(CC R1.3.1; 2.7.1; 2.8.1; 2.8.2; 2.9.1; 2.9.2; PCT R1.3.1; 2.7.1; 2.8.1; 2.10.1; 2.11.1; 2.11.2)

c. Understand the importance of continuity of care between levels of service.
(CC 2.7.1; 2.10.1; PCT R2.7.1; 2.10.1)

d. Identify medication errors and adverse drug reactions.
(CC R2.4.3; 2.9.1; E1.3.1; 1.3.2; PCT R2.4.3; 3.2.6)

4. **Improve communication skills:**
   - **a.** Communicate effectively and professionally with patients, family members, and health care professionals.

   (CC R1.3.1; E3.1.1; E3.1.2; 3.1.3; 3.1.4; PCT R1.3.1)
   - **b.** Effectively present oral/written communications, including patient consultations, drug information responses, and progress notes.

   (CC R1.3.1; 3.1.1; 3.1.2; 3.1.3; 3.1.4; 3.1.5; E3.1.1; 3.1.3; 3.1.4; PCT R1.3.1; 2.12.2)
   - **c.** Seek and provide conflict resolution promptly.

   (CC R1.2.1; E3.1.2)

5. **Document appropriately:**
   - **a.** Any addendum to the medication history should be noted in the chart on the discharge portion of the medication reconciliation form.

   (CC R2.11.1; PCT R2.13.2)
   - **b.** Progress notes should be written in order to enhance communication; topics include pharmacokinetics, direct thrombin inhibitors, and any other pertinent pharmacotherapeutic recommendation.

   (CC R2.11.1; PCT R2.13.2)
   - **c.** All interventions must be documented in eMeds.

   (CC R2.11.1; PCT R2.13.2)
   - **d.** Medication errors and adverse drug reactions must be reported in patient safety net (PSN).

   (CC R2.9.1; 2.9.3; 2.11.1; PCT R2.13.2; 3.2.6)

6. **Display professional behavior and attitude:**
   - **a.** Demonstrate and accept responsibility.

   (PCT R1.1.1; 3.1.3; 1.1.4)
   - **b.** Demonstrate intellectual curiosity, initiative, integrity, and cooperation.

   (PCT R1.1.1; 3.1.2; 3.1.3; 1.1.4)
   - **c.** Give advance notification of illness or schedule conflict.

   (CC R1.2.1)
   - **d.** Dress appropriately and conduct oneself in a manner consistent with professional standards.

   (PCT R3.1.2; 3.1.3; 1.1.4)
   - **e.** Effectively use his/her time.

   (PCT R1.1.1; E7.4.1)
   - **f.** Follow through on assigned tasks in a conscientious manner.

   (CC E2.1.7)
   - **g.** Maintain confidentiality and an awareness of ethical and legal standards.
   - **h.** Display respect and empathy for patients and other health care professionals.
   - **i.** Establish trust, confidence, and rapport with patients and the interdisciplinary team.

   (CC R2.8.1; PCT R2.1.1; 2.8.1)
   - **j.** Embrace life-long learning and plans for future continuing education.

   (PCT R1.1.1)

REQUIREMENTS OF LEARNING EXPERIENCE

Required hours

Generally, the resident will need to be present from 0600 AM to 1700 PM. These hours may vary based on the resident's efficiency, activities occurring that day, and non-rotation activities. The resident shall alert the preceptor if they anticipate they will exceed the resident work hours set forth in the ACGME policy on resident work hours.

Required meetings

Daily rounds
Neurosurgery Case Conference: Thursday at 0800 – 1000 AM (CSB 429)
Cerebrovascular Case Conference: Thursday at 1000 – 1100 AM (CSB 429)
Pharmacy Resident Seminar: Monday at 1300 – 1400 PM
Pharmacy Resident RITE: Friday at 1200 – 1300 PM
Critical Care Pharmacy Journal Club (as announced)
Pharmacy Grand Rounds: Wednesday at 1200 – 1400 PM (as required)
Med-U-Way: 3rd Thursday each month at 1200 – 1300 PM (as desired)
All additional required activities (per residency requirements)

Required presentations

The resident will prepare and deliver at least one brief topic presentation to the medical staff or supervise a student's presentation if applicable. In addition, the resident will present informally to the preceptor throughout the rotation, and, if a student is present, supervise student presentations.

Required readings

A packet of relevant articles will be provided, however, the reading material may vary depending on topics discussed and the resident's demonstration of knowledge.

ROTATION PRECEPTOR

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METHOD OF EVALUATION

Evaluation of residents will be based on the learning experience objectives outlined by the Residency Program Director (RPD). The RPD will identify the specific goals and objectives on which the resident will be evaluated (available in E-Value). The preceptor and resident will review the resident's customized plan and the learning experience introduction document on the first day of rotation. Feedback will include, but not be limited to, verbal and written mid-point and end of rotation evaluations.

The resident will receive formal written and verbal evaluation approximately two weeks after starting the rotation and within 3 days of completing the rotation, usually on the final day of the rotation. The final evaluation will reflect the goals and objectives identified for the rotation in E-value. Evaluations will incorporate feedback from the interdisciplinary team when available. In addition, the preceptor will make every attempt to provide informal feedback to the resident throughout the month. The resident is encouraged to seek feedback at any time.

The resident is expected to provide verbal feedback to the preceptor regarding any areas of the rotation that could be improved to enhance the rotation, both for the month and in the future, at the midpoint and final evaluations. Interim feedback is welcome.