Neonatal ICU Rotation Description

Mayo Clinic
Hospital Pharmacy Services

Rotation Summary

**Rotation Title:** Neonatal Intensive Care Unit  
**Rotation Length:** 4 weeks

**Primary Preceptors Names:** Brandi Smith, Kent Johnson  
**Phone:** 5-5972  
**Hours:** 0700-1700

**General Description:**

The Mayo Eugenio Litta Children’s Hospital is a “Hospital within a Hospital” based at the Saint Marys campus in Rochester. The Children’s Hospital is a 130-bed hospital that includes a General Care Area, Pediatric Intensive Care Unit, Neonatal Intensive Care Unit (level II and level III), Pediatric Transplant Unit, and a Pediatric Infusion Therapy Center.

The Neonatal Intensive Care Unit (NICU) is a 56-bed unit allowing for care of level II and level III neonates. Thirty beds are located at Saint Mary’s Hospital which house level II and level III neonates. In addition, 26 beds are located at Rochester Methodist Hospital and house primarily level II neonates. A majority of the patients in the NICU are low birth weight or very low birth weight. Neonates with congenital surgical issues and congenital medical issues are also cared for in the NICU. Many babies are transported to the NICU from Rochester Methodist Hospital shortly after their premature birth; however, we do also admit babies born at other outside hospitals. The Medical Neonatal Service is the primary service for all patients in the NICU.

Comprehensive pharmacy services that are provided to the patients on the NICU Service include: pharmacokinetic services, pharmaceutical care, pharmacy clinical rounds, fluid, electrolyte, and TPN calculations, as well as a satellite pharmacy that provides a majority of medication doses to nursing in a ready-to-administer form.

**Disease States:**

The resident will develop a knowledge base in the following NICU disease states and topic areas:

- Respiratory Distress
- Apnea of Prematurity
- Bronchopulmonary Dysplasia
- Persistent Pulmonary Hypertension
- Transient Tachypnea of the Newborn
- Hypotension
- Patent Ductus Arteriosus
- Benzyl Alcohol Intoxication
- Neonatal seizures
- Intraventricular Hemorrhage
- Hypoxic/Ischemic brain injury
- Jaundice, hyperbilirubinemia, and kernicterus
- Necrotizing Enterocolitis
- Common Neonatal Infections
- Meconium Aspiration/Ileus
- NICU Pharmacokinetics
- Nutrition (IV and enteral feeds, hypoglycemia, calculation of TPN)
- Retinopathy of Prematurity
- Pain Management
- Common NICU medications

**Goals Selected:**

R1.4: Demonstrate ownership of and responsibility for the welfare of the patient by performing all necessary aspects of the medication-use system.

- R1.4.1: Display initiative in preventing, identifying, and resolving pharmacy-related patient-care problems.

R1.5: Provide concise, applicable, comprehensive, and timely responses to requests for drug information from
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patients and health care providers.

- R1.5.1: Discriminate between the requesters’ statement of need and the actual drug information need by asking for appropriate additional information.
- R1.5.2: Formulate a systematic, efficient, and thorough procedure for retrieving drug information.
- R1.5.3: Determine from all retrieved biomedical literature the appropriate information to evaluate.
- R1.5.4: Evaluate the usefulness of biomedical literature gathered.
- R1.5.5: Formulate responses to drug information requests based on analysis of the literature.
- R1.5.6: Provide appropriate responses to drug information questions that require the pharmacist to draw upon his or her knowledge base.
- R1.5.7: Assess the effectiveness of drug information recommendations.

R2.1: As appropriate, establish collaborative professional relationships with members of the health care team.

- R2.1.1: Implement a strategy that effectively establishes cooperative, collaborative, and communicative working relationships with members of interdisciplinary health care teams.

R2.2: Place practice priority on the delivery of patient-centered care to patients.

- R2.2.1: Choose and manage daily activities so that they reflect a priority on the delivery of appropriate patient-centered care to each patient.

R2.4: Collect and analyze patient information.

- R2.4.1: Collect and organize all patient-specific information needed by the pharmacist to prevent, detect, and resolve medication-related problems and to make appropriate evidence-based, patient-centered medication therapy recommendations as part of the interdisciplinary team.
- R2.4.2: Determine the presence of any of the following medication therapy problems in a patient's current medication therapy: (1) Medication used with no medical indication; (2) Patient has medical conditions for which there is no medication prescribed; (3) Medication prescribed inappropriately for a particular medical condition; (4) Immunization regimen is incomplete; (5) Current medication therapy regimen contains something inappropriate (dose, dosage form, duration, schedule, route of administration, method of administration); (6) There is therapeutic duplication; (7) Medication to which the patient is allergic has been prescribed; (8) There are adverse drug or device-related events or potential for such events; (9) There are clinically significant drug-drug, drug-disease, drug-nutrient, or drug-laboratory test interactions or potential for such interactions; (10) Medical therapy has been interfered with by social, recreational, nonprescription, or nontraditional drug use by the patient or others; (11) Patient not receiving full benefit of prescribed medication therapy; (12) There are problems arising from the financial impact of medication therapy on the patient; (13) Patient lacks understanding of medication therapy; (14) Patient not adhering to medication regimen.
- R2.4.3: Using an organized collection of patient-specific information, summarize patients’ health care needs.

R2.6: Design evidence-based therapeutic regimens.

- R2.6.1: Specify therapeutic goals for a patient incorporating the principles of evidence-based medicine that integrate patient-specific data, disease and medication-specific information, ethics, and quality-of-life considerations.

R2.7: Design evidence-based monitoring plans.

- R2.7.1: Design a patient-centered, evidence-based monitoring plan for a therapeutic regimen that effectively evaluates achievement of the patient-specific goals.

R2.8: Recommend or communicate regimens and monitoring plans.

- R2.8.1: Recommend or communicate a patient-centered, evidence-based therapeutic regimen and corresponding monitoring plan to other members of the interdisciplinary team and patients in a way that is systematic, logical, accurate, timely, and secures consensus from the team and patient.

R2.9: Implement regimens and monitoring plans.

- R2.9.1: When appropriate, initiate the patient-centered, evidence-based therapeutic regimen and monitoring plan for a patient according to the organization's policies and procedures.
- R2.9.2: Use effective patient education techniques to provide counseling to patients and caregivers, including information on medication therapy, adverse effects, compliance, appropriate use, handling, and medication administration.

R2.10: Evaluate patients’ progress and redesign regimens and monitoring plans.
R2.10.1: Accurately assess the patient’s progress toward the therapeutic goal(s).
R2.10.2: Redesign a patient-centered, evidence-based therapeutic plan as necessary based on evaluation of monitoring data and therapeutic outcomes.

R2.11: Communicate ongoing patient information.
- R2.11.1: When given a patient who is transitioning from one health care setting to another, communicate pertinent pharmacotherapeutic information to the receiving health care professionals.
- R2.11.2: Ensure that accurate and timely medication-specific information regarding a specific patient reaches those who need it at the appropriate time.

R2.12: Document direct patient care activities appropriately.
- R2.12.1: Appropriately select direct patient-care activities for documentation.
- R2.12.2: Use effective communication practices when documenting a direct patient-care activity.
- R2.12.3: Explain the characteristics of exemplary documentation systems that may be used in the organization’s environment.

### Activities:

<table>
<thead>
<tr>
<th>Activities:</th>
<th>Goals/Objective:</th>
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<tbody>
<tr>
<td>Review all patients’ histories upon admission to the NICU.</td>
<td>R2.4</td>
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<tr>
<td>- Identify significant maternal issues that impact the baby’s condition.</td>
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<td>- Identify conditions for which baby may be at risk upon admission to NICU.</td>
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<td>- Identify current medical problems that require drug therapy.</td>
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<td>- Obtain an accurate history of medications given to mom and baby during labor, delivery, and resuscitation when appropriate.</td>
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<td>- Obtain pertinent normal and abnormal laboratory values.</td>
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| Evaluate initial medication therapy regimen for appropriateness. | R2.4 |
| - Know the pharmacology of each drug used. | |
| - Know the indication for each drug used. | |
| - Assess drug selection given the patient’s medical problem list, gestational age, contraindications, and drug interactions. | |
| - Evaluate dose given the patient’s organ function, age, gestational age, weight, and potential drug interactions. | |
| - Determine if route and method of administration is optimal for baby’s needs. | |
| - Evaluate regimen for therapeutic duplications or omissions. | |

| Develop a drug therapy-monitoring plan. | R2.6 R2.7 |
| - Determine parameters (objective and subjective) to monitor for efficacy and/or toxicity. | |
| - Determine how often each monitoring parameter should be reviewed. | |
| - Define acceptable endpoints for therapy. | |

| Evaluate the outcomes of implementing the pharmacotherapeutic regimen and modify as needed based on continuous evaluation of data. | R2.4 R2.10 |
| - Gather data as called for in the monitoring plan | |
| - Compare values of each parameter to the desired values | |
| - Modify the pharmacotherapeutic regimen as necessary based on evaluation of data | |
| - Document outcomes of implementing the pharmacotherapeutic regimens and modifications to the regimen | |

| Assess and monitor fluid, electrolyte, and parenteral nutrition therapy. | R2.6 R2.7 |
| - Determine appropriate volume intake, electrolyte requirements, and nutritional needs when applicable. | |
| - Evaluate parenteral nutrition therapy for physical incompatibilities, appropriate fluid intake, caloric intake, and daily intake of electrolytes, vitamins, trace elements, fat, and protein. | |
| - Participate in writing, checking, and processing neonatal IV fluid and parenteral nutrition orders on a daily basis as time permits. | |

| Pharmacokinetic consultation on any medications monitored by serum levels | R2.6 R2.7 |
| - Gentamicin, Vancomycin, Phenobarbital, Caffeine, etc. | |
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**Documentation**
- Review all monitors for the neonatal intensive care unit
- Document all of the above activities in P-Care
- Document all therapeutic interventions in P-Care
- Document all patient progress notes in P-Care
- Document clinical activities in the Electronic Medical Record per Hospital Policy

**Attend NICU service rounds daily. Contribute to drug therapy decisions, bring forth medication-related issues, provide drug information, and provide informal medication education as the need arises or is requested.**

**Research therapeutic issues as requested by the NICU staff, nurses, or preceptors.**

**Participate in NICU Code 45 activities as appropriate.**

**Attend Friday Morning Pediatric Grand Rounds**

**Preceptor Interaction:**
- Meet with preceptor on a regular basis (4-5 times per week) to review NICU patients. Review past medical history, history present illness, and pertinent laboratory data as it relates to disease state and therapeutic drug monitoring, evaluate initial drug therapy, identify potential medication related issues, develop monitoring plan for medication therapy, report on parameters being following in monitoring plan, discuss potential modification of therapy base on results of monitoring, identify medication therapy endpoints and patient progress towards reaching the endpoints.
- Present at least one 30 minutes inservice to the pharmacy staff or NICU Service. As an alternative, may develop a specific pharmacy/medication project that pertains to the NICU Service and their patients.
- Meet with the preceptor at the midpoint of the rotation for a verbal evaluation and near the end of the rotation for a written evaluation, using Resitrak.

**Evaluation Strategy**
ResiTrak will be used for documentation of formal evaluations. For evaluations, resident and preceptor will complete the evaluations separately. The preceptor and the resident will meet to discuss the evaluations. This discussion will provide feedback for both the resident and preceptor on their performance.

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<thead>
<tr>
<th>What type of evaluation</th>
<th>Who</th>
<th>When</th>
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<tbody>
<tr>
<td>Verbal</td>
<td>Preceptor, Resident</td>
<td>Mid-Rotation</td>
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<tr>
<td>Summative</td>
<td>Preceptor, Resident</td>
<td>End of learning experience</td>
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<tr>
<td>Summative Self-evaluation</td>
<td>Resident</td>
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<td>Resident</td>
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