Here is some helpful information to guide you through the daily routine up in the NICU

**Numbers to know:**
Education Coordinator
Todd Smith: 11111-7033  Ext. 18725

Neo-Peds Lead Therapist
Carla Gianoli-Smith: 11111-7002  Ext. 11634

Charge Person: 11111-7001  Ext. 11904

NICU Therapist Beepers: 11111-7006 & 7007
NICU STAT-Lab & Report Room: Ext. 13815

**Respiratory Therapist Report Times:** 6:30-7:00
**Nursing Report Times:** 7:00-7:30
**Physician Report Times:** 8:00-9:00am & 5:00-6:00pm

**Resident Bedside/Teaching Rounds:** M-W-F  9:30-10:30am

**Keypad Lock Codes:** Breakroom, Clean & Dirty Utilityrooms….1-3-5
Stairwell at end of hall….5-1-2
Our NICU is one of the largest in the world, serving a large geographical area. Our transport teams travel by ground and air, traveling to the upper peninsula, eastward toward Saginaw and Lansing, and southward toward Kalamazoo. Our census can be upward of 80 infants between the intensive care and intermediate units. We have 9 neonatologists and 10 neonatal nurse practitioners that rotate their time between the Blodget and Butterworth campuses. We also have a respiratory care staff that specialize in neonatal, as well as, a group of therapists that rotate between neonatal and pediatrics. We are also a teaching institution serving residents, interns, nursing, and other allied health students. The large patient population and a large specialized staff serves as an ideal clinical learning environment. We hope that our visiting students take full advantage of this by actively interacting with the staff.

When you come in for clinicals, feel free to make your way straight up to the NICU. If you are unsure of the way, you may come into the respiratory care department and have someone bring you up there.

Shift report begins at 6:30am & pm.

Scrubbing is required before touching the babies. It is best to simply leave any rings, bracelets, watches, etc. at home. You won’t be allowed to wear them. Anything with a long sleeve is not allowed, either. Scrub up to your elbows, similar to your O.R./intubation rotation. We will show you which sinks, soaps, brushes, etc. to use. Make sure that you wash or use the alcohol-based handcleaner between babies. Do not bring your favorite pen to use for charting. Each baby will have pens at the bedside for you to use, pens can carry germs from one baby to the next.

Infant care/stim times will be labeled on the respiratory equipment as a 8-2, 9-3, etc. If you are unsure, simply ask the bedside nurse. We will make every attempt to assess and interact with the babies during their stim times. The babies need as much uninterrupted sleep as possible, so it is very important that we be there during those specific times. If pressed for time due to a heavy assignment, the ventilators may be checked before or after, between 7:00 and 10:00, or 1:00 and 4:00. In otherwords, you may have to split vent checks from patient care.

Circuit changes are performed every 7 days. There is a schedule in the STAT Lab, and on the ventilator sheet.
In-line suction catheters are changed every 3-4 days. The whole system with all the suction tubing is to be changed with the ventilator circuit, every 7 days. 3 days later, just the catheter, itself, will be changed. There should be a colored sticker on the thumb port indicating the correct change date. We do measured suctioning to reduce damage to the carina and airways. There should be a card posted on the isolette/crib with the appropriate measurements. Please pay attention to this when doing your patient care.

Transcutaneous CO$_2$/PO$_2$ monitors are to be recalibrated and site changed every 4-6 hours depending upon the patient’s stim times. We primarily use the TcCO$_2$ for trending purposes. The TcPO$_2$ is generally not utilized that often, as we primarily utilize the pulse oximeter to determine changes in oxygenation. Because CO$_2$ diffuses readily across the skin, we can utilize a much lower temperature on our membranes. Usually we run them at 41-41.5 degrees Celcius.

X-rays can be viewed on our digitizer. Films from several days can be viewed on this system. Your patient’s should be viewed sometime during the beginning of the shift. Please ask your preceptor.

If you give medications, you will be required to document this on the bedside medication sheet and on the daily sheet. The sheets can be found in and/or around the teal chart. Any problems, just ask the nurse or your preceptor.

Physician orders and progress notes are found in the burgundy chart. It is important to review this information on a daily basis.

Although, you will have required check-offs to do and you will be learning about respiratory care equipment, the most important part of this rotation will be learning about premature infants.

Widen Your Focus!

Not all of you will be working in children’s hospitals with NICUs, but there will come a day when you are presented with an infant in distress. Whether you work in a small, outlying hospital, an emergency room, or are a parent, it is extremely important for you to learn about the care of infants. What you do or not do can impact the life of that infant for the rest of his/her days. Recognizing what is normal and abnormal for an infant, and recognizing the early, subtle signs of stress can help you intervene before it’s too late. The few hours before a well-trained transport team can arrive is extremely critical to the outcome. You may be put in a situation with inexperienced nursing and physician staff, and as a result, you have an opportunity to make a difference. Pay attention to all aspects of care, ask questions, go on physician rounds, hold the infants, talk to the parents. You get out of this rotation what you put into it!
Developmental care is a concept revolving around the fact that premature infants are still supposed to be in the womb. As a result of being born premature, they are now subject to an environment that is not conducive to the proper development of the infant’s mental and physiologic status.

When you do your day-to-day patient care in the NICU, be aware of not only what you do, but how you do it. Study how experienced nursing staff interact with the infants, and please ask questions.

A premature infant does not have the ability to control the muscles in the iris, as a result, the infant cannot focus and is extremely photo-sensitive. Shielding the infant’s eyes with a cover or your hand when assessing can reduce physiologic stress and the chances for bradycardia, apnea, and/or desaturation.

Hearing is well developed at early gestation, but the premature infant’s brain cannot filter out sounds. As a result, they may become overwhelmed with the stimulation and become stressed. Make every attempt to keep a soft voice and keep your actions very quiet.
The sense of smell and taste is extremely well developed in the infant. An infant in a closed isolette can smell his lactating mother from several feet away! The sense of taste is on the same order of intensity. So, be careful about perfumes and other personal hygiene products, as these smells are extremely potent to the infants. Be careful about the alcohol-based hand cleaners, as well. Make sure your hands are dry before handling the infant.

The premature infant’s brain has not developed enough to habituate or anticipate stimuli. As a result, all sensory stimuli can be interpreted as intense, and can easily stress the infant.

When a premie is stimulated, one of the common reactions is for the infant to extend the arms and legs. In the womb, when the fetus pushes out, the walls of the womb give resistance and the extremities naturally fall back up against the body. Out of the womb, however, this is not the case. As a result, we must give those borders and/or hold the extremities against the body to calm the infant down. They have very well developed extensor muscles, but underdeveloped flexors, so when the push out, they don’t always bring their extremities back in. Simply bring the knees upward and fold the arms so the hand are up by the face, then gently hold the premie in this position. After a few seconds, the premie will calm down again. Do NOT stroke the head, arms, etc. It’s way to stimulating.

When you are finished with your care, please make sure that the blanket rolls/bumpers are properly wrapped around the body and that the infant is properly wrapped in the “fetal” position, but with the head upward, not with the chin on the chest. Proper airway mechanics must be paid attention to.
Please help us help them

Everyone wins!
The best way to answer these questions is by asking the right people. These questions are designed to make the student utilize critical thinking skills and interact with the NICU staff.

1. Besides vitals, how can one identify a premature infant under stress?
2. How are premature infant responses to stimuli, such as sound, light, smell, touch, and taste different from a term infant?
3. How does nasal cannula flow influence the premature respiratory system? How is it different from CPAP?
4. What types of respiratory care interventions are associated with intracranial (IVH, GMH) hemorrhages, periventricular leukomalacia (PVL), and/or long-term brain damage in the premature infant? What precautions should one take to reduce these complications?
5. Why should one assess the abdomen as part of the routine respiratory care assessment in the NICU? What should one be looking for?
6. If there is an airway leak around an endotracheal tube, what criteria determine whether or not the premature infant will be reintubated with a larger tube? What are the potential long-term hazards of reintubating with a larger endotracheal tube?
7. If one notices that a premature infant is upset and is wildly extending and moving his/her extremities, what simple technique can be done to calm the infant?
8. Which is associated with retinopathy of prematurity (ROP), FiO$_2$ or PaO$_2$? Why?
9. Which is associated with chronic cystic lung disease or bronchopulmonary dysplasia, FiO$_2$ or PaO$_2$? Why?
10. What are the potential pulmonary complications associated with a prolonged patent ductus arteriosus (PDA)?
11. Roughly how long does it take for the typical premature infant to drop his/her SpO$_2$ from say 100% down to 80%? How is this different from an adult, and why? What precautions might one take prior to any interventions/procedures in light of this?
12. In what ways is the surfactant produced by a premature infant different from a term infant?
13. What is the potential association between indomethicin (indocine) and necrotizing enterocolitis (NEC) in the premie?
14. What are the potential benefits of using a water seal or bubble CPAP system over ventilator CPAP in the premature infant?
15. Why is nasal patency critical to an infant? How does one check for it?
16. Why are there specific stimulation/care times for premature infants in the NICU?
17. In what way are premie blood gas normals different from pediatric or adult normals? Why?
18. Whether ventilating a premie using a time-cycled, pressure-limited mode or a volume mode, what should your target tidal volume range be (in ml/kg)?
19. Why is fine-tuning the flow and inspiratory time so critical when ventilating infants? How is this performed?
20. How is chronic pulmonary hypertension associated with prolonged, unstable SpO₂ and/or chronic cystic lung disease in the infant?
21. What is surfactant inactivation? What things can cause it?
22. What is considered the most critical time for the development of intracranial hemorrhages?
23. What is NEC? What causes it? How is it treated? What are the early or initial signs and symptoms during physical examination?
24. Why is it important to note the cardiac point of maximal impact (PMI) when auscultating the heart and lungs of an infant?
25. Nearly all premature infants have intercostals and/or subcostal retractions, to some degree. Why? What are the characteristics associated with respiratory distress in the premature infant?