

# NICU rotation

For residents and medical students

Updated on 6/16/2025

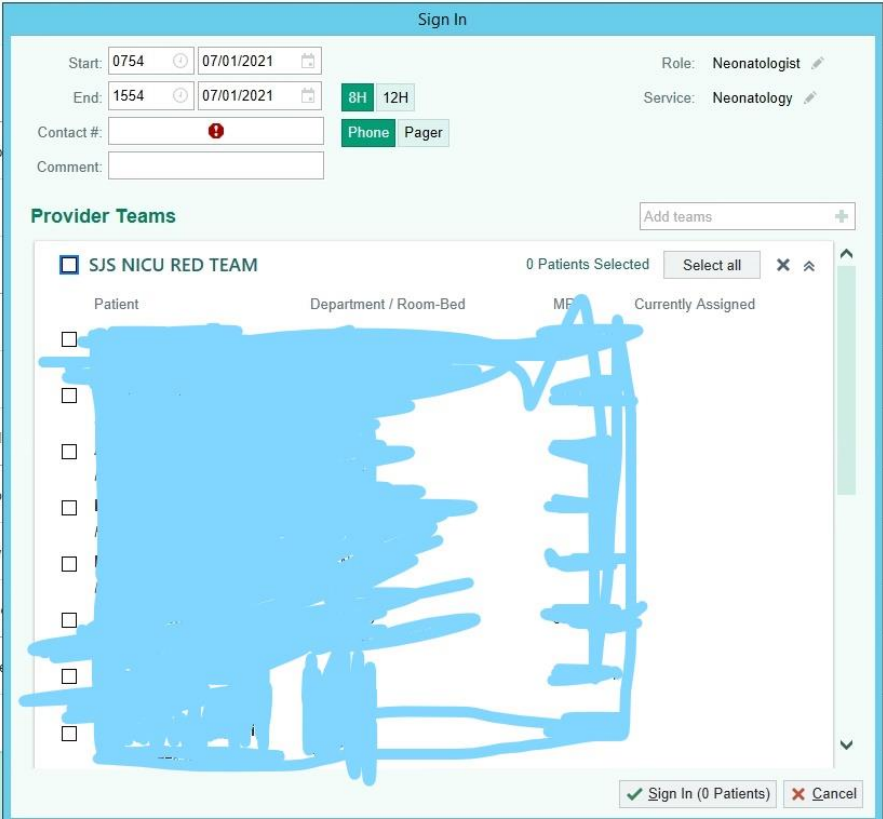
# Rotation requirements

- Carol Jo Vecchie Women's Center - 4th floor
- Please try to get access to EPIC before starting your rotation.

# Resident

- Pediatric residents get a sign-out from the NNP at 7 AM, Please be in the room by 6:55 AM
  - Short call – 7 AM till 5 PM
  - Long call – 7 AM till & PM
- Make sure that you have at least 10 hours off between shifts
- Make sure that you have at least 24 hours off between rotations
- Please make sure to **continuously update** your patients' **discharge summaries**, especially before signing off to the following residents

# Residents must sign in/out with their names for the patients



# Please use the below smart phrases in the NICU

- .DNHP – NICU H&P
- .NICUDISCHARGESUMMARYAPR21
- .NICUSJSDELIVERYATTENDANCENOTE
- .NICUSJSINTUBATION
- .NICUSJSLUMBARPUNCTURE
- .NICUSJSNEWBORNCONSULT
- .NICUSJSPROCEDURENOTE
- .NICUSJSPROGRESSNOTE
- .NICUSJSCIRCUMCISION
- .NICUSJSUMBILICALLINEINSERTION

# Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
7:00 Sign out from NNP	7:00 Sign out from NNP	7:00 Sign out from NNP	7:00 Sign out from NNP	7:00 Sign out from NNP
8:00 Resident Round or Pediatric/NICU M&M	8:00 Journal club (third Tuesday of the month)	8:00 Resident Round	8:00 Pediatric grand round	8:00 Resident Round
9:30 - 12:00 NICU Round	9:30 - 12:00 NICU Round	9:30 - 12:00 NICU Round	9:30 - 12:00 NICU Round	9:30 - 12:00 NICU Round
	14:30 Discharge Round	12:30 MFM/NICU meeting	12:30 - 1500 Resident Core Conferences	

# What do you need for the rotation....

- **NICU Resident/NNP Guidelines (PDF)**
  - Ask Elisia Hopkins or Amber Davis, neonatology office specialists, about the PDF.
- **Rounding sheet**
  - Present on the desk in the purple working area in the NICU or in the conference room where the residents sit

[illegible]

The bedside nurse starts with overnight events and social concerns.



Then, your presentation should be in the following format ...

# Age in days and gestational age (GA)

- Age in days
  - Example: 2 days old, 5 days old ...
- Corrected Gestational Age (cGA) or Post Conceptual Age (PCA) or Postmenstrual Age (PMA)
  - Example: A newborn is born at 30 weeks and 5 days. The newborn is 4 days old. The newborn's cGA is 31 weeks and 2 days
    - PS: Epic may have a different calculation

# Apnea, Bradycardia and Desaturation

- Bedside nurse
- Charted in epic
  - Summary → Apnea/Bradycardia tab
  - Flowsheets → PICU/NICU VS → Apnea and Bradycardia

The screenshot shows the 'Summary' tab in the Epic EMR system. The left sidebar contains navigation options: Summary, Chart Review, Results Review, Problem List, Intake/Output, Flowsheets, Notes, Growth Chart, Care Everywhere, Manage Orders, and History. The main content area is titled 'Apnea/Bradycardia' and includes a 'Select Font Size' dropdown. Below this, there is a section for 'Apnea/Bradycardia Events (last 14 days)'. The table below lists the events with columns for Date/Time, Apnea, Apnea (secs), Bradycardia Rate, Bradycardia (secs), Event SpO2, Color Change, Intervention, Activity Prior to Event, Position Prior to Event, Choking, and New Intervention.

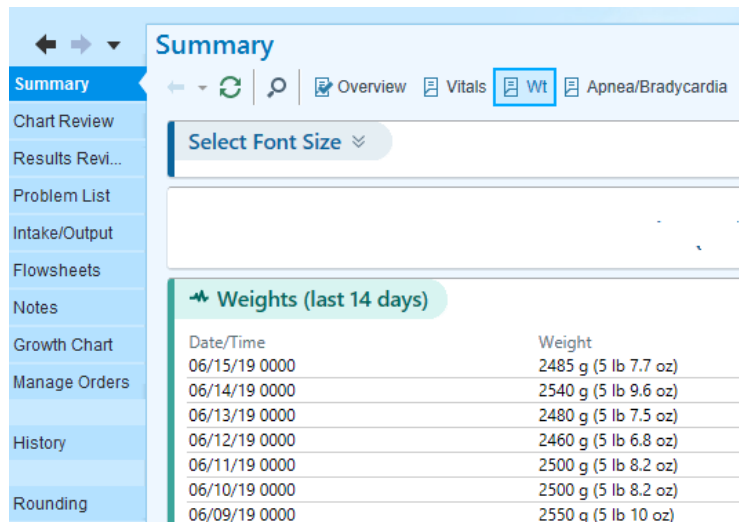
Date/Time	Apnea	Apnea (secs)	Bradycardia Rate	Bradycardia (secs)	Event SpO2	Color Change	Intervention	Activity Prior to Event	Position Prior to Event	Choking	New Intervention
06/11/19 0540	Apnea (no respirations for 20 sec)	20 secs	68	20 secs	—	Dusky/Pale	Vigorous tactile stimulation/Other (Comment)	Active alert	Supine	No	None

Event SpO2: wasn't picking up at time of event at 06/11/19 0540  
Intervention: bagging at 06/11/19 0540

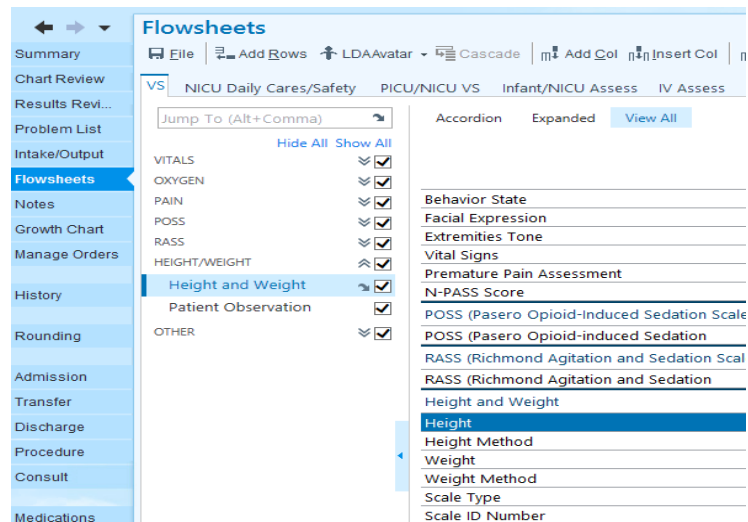
The screenshot shows the 'Flowsheets' menu in the Epic EMR system. The menu is open, showing options: Summary, Chart Review, Results Review, Problem List, Intake/Output, Flowsheets (highlighted), Notes, Growth Chart, Care Everywhere, Manage Orders, and History. The 'Flowsheets' sub-menu is open, showing options: VS, PICU/NICU VS (selected), and Infant/NICU. Below these, there is a 'Jump To (Alt+Comma)' dropdown. The 'Vitals' section is expanded, showing a list of vital signs with checkboxes: Apnea and Bradycardia, Oxygen Therapy, Art Line (1), Invasive Hemodynam..., ICP/Pressure, CPP Calculations by ..., and RASS (Richmond Agit...).

# Weight

- Current weight in grams (gms)



Date/Time	Weight
06/15/19 0000	2485 g (5 lb 7.7 oz)
06/14/19 0000	2540 g (5 lb 9.6 oz)
06/13/19 0000	2480 g (5 lb 7.5 oz)
06/12/19 0000	2460 g (5 lb 6.8 oz)
06/11/19 0000	2500 g (5 lb 8.2 oz)
06/10/19 0000	2500 g (5 lb 8.2 oz)
06/09/19 0000	2550 g (5 lb 10 oz)



VS	NICU Daily Cares/Safety	PICU/NICU VS	Infant/NICU Assess	IV Assess
Jump To (Alt+Comma)				
Hide All Show All				
VITALS				
OXYGEN				
PAIN				
POSS				
RASS				
HEIGHT/WEIGHT				
Height and Weight				
Patient Observation				
OTHER				

Behavior State
Facial Expression
Extremities Tone
Vital Signs
Premature Pain Assessment
N-PASS Score
POSS (Pasero Opioid-induced Sedation Scale)
POSS (Pasero Opioid-induced Sedation)
RASS (Richmond Agitation and Sedation Scale)
RASS (Richmond Agitation and Sedation)
Height and Weight
Height
Height Method
Weight
Weight Method
Scale Type
Scale ID Number

# Compare weights

- Change per day

- Example

- The newborn gained 30 gms compared to yesterday's weight
    - The newborn lost 10 gms compared to yesterday's weight

- Change from birth or per week

- Example

- The newborn gained 30 gms compared to birth weight
    - The newborn gained 200 gms over a week

- You compare the weight to birth weight for the first week of life then per week

- Always calculate the % of weight loss compared to birth weight

- **= [(birth weight - actual weight) / birth weight] \* 100**

- Example

- Newborn A has a birth weight of 2.6 Kg but current weight is 2.35 Kg. Calculate % of weight loss since birth.
    - $[(2.6 - 2.35) / 2.6] \times 100 = 9.6\%$

Use birth weight until the newborn  
attains birth weight or passes it

# Total fluids in ml/kg/day

- Total fluid (ml/kg/day) = total enteral volume (ml/kg/day) + total parenteral volume (ml/kg/day)

# Total Enteral Volume

Newborn could be

- NPO
- Receiving expressed breast milk and/or donor breast milk and/or formula
- Fortified or not fortified
- Oral and/or feeding tube
- Don't forget to mention if breastfeeding was attempted



# Total Enteral Volume

- Ad lib (as needed)
  - You get the total enteral volume in 24 hours from Epic's Intake/Output tab, and divide this number by weight.
    - Example: A 2.5 kg newborn ate 500 ml in the last 24 hours. The volume is  $500 \text{ ml} / 2.5 \text{ kg} = 200 \text{ ml/kg/day}$ .
- Oral and feeding tube
  - You get the total enteral volume in 24 hours from Epic's Intake/Output tab and divide this number by weight.
  - You get the total enteral volume in 24 hours from the Intake/Output tab that was given orally, divide this number by the total enteral volume, and multiply it by 100, which is the percent of oral intake.
    - Example: A newborn weighs 1.35 kg and eats 216 ml in the last 24 hours. 100 ml was administered orally. Total oral intake is:  $(100/216)*100 = 46\%$ 
      - **PS: Always use birth weight until the newborn gains it**

# Neonatal Enteral Nutrition Guidelines

## NEONATAL ENTERAL NUTRITION GUIDELINES EFFECTIVE 01/07/2019

Minimal clinical requirements for initiation of enteral feeding are usually as follows:

- Stable cardio-respiratory status
- Absence of bilious or non-bilious emesis
- Absence of significant abdominal distention
- Absence of clinically significant patent ductus arteriosus
- Absence of umbilical arterial catheter
- At least 24 to 48 hours from last dose of ibuprofen/indomethacin

### Feeding Advancement Schedule:

Dosing Weight (grams)	Initial Volume Advancement Volume	When to Advance	Initial Product	Fortification
< 1250	20 ml/kg/day (q3h)	<750 gm: hold at 20 ml/kg x2 days, then advance daily 750 – 1249 gm: advance daily	MBM or DBM	Prolacta +6 (at 80 ml/kg)
1250 – 1499	20 ml/kg/day (q3h)	Advance daily	MBM or DBM	Fortify to 24 kcal/oz w/Similac HPCL (at 80 – 100 ml/kg)
1500 – 2499	30 ml/kg/day (q3h)	Advance daily	MBM or DBM if <33 <sup>0/7</sup> weeks GA or Similac Special Care 24 High Protein Formula	MBM or DBM: fortify to 24 kcal/oz w/Similac HPCL or Similac Special Care 24 High Protein Formula (at 80 – 100 ml/kg)
≥ 2500	≤ 40 ml/kg/day (q3h)	Advance daily	MBM	GA at birth <37 <sup>0/7</sup> weeks: fortify to 24 kcal/oz with Similac HPCL or GA at birth ≥37 <sup>0/7</sup> weeks: fortify per RD recommendation (at 80 – 100 ml/kg)
			NeoSure 22 kcal/oz (if GA at birth <37 <sup>0/7</sup> weeks) or Similac Advance 19 kcal/oz formula (if GA at birth ≥37 <sup>0/7</sup> weeks)	Increase calorie concentration per RD recommendation

*Note: Above guidelines should not replace clinical judgment.*

### General Enteral Nutrition guidance:

1. Use birthweight as dosing weight until birthweight is regained, then use current weight.
2. Do not fortify and advance feeding volume on the same day.
3. Initial enteral feeding goal is 150 – 160 ml/kg/day (preterm infants) or 170 – 180 ml/kg/day (term infants) unless contraindicated.
4. If patient does not tolerate bolus feedings consider continuous or transpyloric feeds.
5. Donor breast milk: Use for all infants with birthweight <1500 gm and at physician discretion for infants with birthweight ≥1500 gm born <33<sup>0/7</sup> weeks GA. Transition from donor breastmilk to formula at about 34<sup>0/7</sup> weeks PMA per RD recommendation.

Always try to follow the feeding protocol (advancement and fortification per dosing weight and considering gestational age)

It is present in the Resident Manual

PS: In certain situations, the rounding neonatologist deviates from the protocol

# Enteral nutrition - calories

- Breast milk calories are 20 Kcal/oz
  - PS: The actual breast milk calories are unknown
- Fortification could be 22 Kcal/oz, 24 Kcal/oz, 26 Kcal/oz, 28 Kcal/oz, 30 Kcal/oz
  - Sometimes we add prolacta cream to increase the calories more
  - 2.5 Kcal per 1 ml of prolacta cream - approximately 2 Kcal/oz
- Calculation in Kcal/kg/day
  - 20 kcal → 1 oz → 30 ml
  - Multiply the enteral fluid volume (in ml/kg/day) by calories and divide by 30 ml
    - Baby B is 12 days old. He is a former 29-weeker. He gets 120 ml/kg/day of prolacta 26 Kcal/oz. His calories are:
    - $(120 \times 26) / 30 = 104$  Kcal/kg/day

# Parenteral volume

- Intravenous fluid options
  - D5W or D10W
  - D5 ¼ NS or D10 ¼ NS
  - Total Parenteral Nutrition (TPN)
  - Others
- Central line (PICC line, Umbilical lines, Broviac)
  - Add heparin
- Start total parenteral volume between 60 ml/kg/day and 100 ml/kg/day, depending on the initial diagnosis, gestational age, and weight

# Parenteral volume - calculation

- Glucose concentration

- Dextrose in percent = glucose in gms in 100 ml
- Example: D5 = 5% = 5 gms of glucose in 100 ml

- Calories from dextrose

- **1 gm CHO gives 3.4 Kcal**
- $(\text{Dextrose\%} \times \text{total fluid in ml/kg/day}) / 100 \text{ ml of water} = \# \text{ in gm/kg/day}$
- $\# \text{ in gm/kg/day} \times 3.4 \text{ Kcal/gm} = \text{calories from dextrose}$ 
  - Example
    - The newborn is 2.5 kg on D10 water at 80 ml/kg/day. Calculate the calories from dextrose
    - D10 = 10 gms in 100 ml of water
    - $10 \times 80/100 = 8 \text{ gm/kg/day} \rightarrow 8 \times 3.4 = 27 \text{ Kcal/kg (CHO)}$

# Glucose Infusion Rate (GIR)

- Every infant on continuous infusion that has dextrose should have a GIR calculated and presented during the round
  - $[\text{Dextrose\%} \times \text{fluid intake (ml/kg/day)}] / 144 = \text{GIR in mg/kg/min}$
  - $(\text{Dextrose\%} \times \text{current IV rate}) / 6 / \text{weight} = \text{GIR in mg/kg/min}$ 
    - Start GIR between 4 and 6 mg/kg/min
    - Advance by 1 to 2 mg/kg/min daily
    - Maximum 12 mg/kg/min
    - Monitor GIR by accucheck

# Intralipid

- Every 1 gms of intralipid gives 10 Kcal.
  - Dietary fat: 9 Kcal/gm - the fat in intralipid has a glycerol molecule attached, which adds 1 Kcal/gm
- Intralipid used in TPN is between 0.5 and 3 gms/kg/day
- Calories
  - Number of gm/kg/day x 10 = calories from intralipid
    - Example
      - The newborn weighs 0.98 kg. He is on 2.5 gm/kg/day intralipid. Calculate the calories from lipids?
      - $2.5 \text{ gm/kg/day} \times 10 = 25 \text{ kcal/kg}$

# Omegaven

- It is 11 Kcal/gms
- Always dosed at 1 gms/kg
- Used for any infant with direct hyperbilirubinemia more than 2
- Calories
  - Number of gm/kg/day x 11 = calories from Omeven
  - Example
    - The newborn weighs 1.25 kg and is on 1 gm/kg/day Omeven. Can you calculate the calories from Omeven?
    - $1 \text{ gm/kg/day} \times 11 = 11 \text{ kcal/kg}$



# Protein

- Every 1 gms of protein gives 4 Kcal
- Protein used in the TPN ranges between 2 and 4 gms/kg
- Calories
  - Number of gm/kg of protein x 4 Kcal = calories
    - Example
      - The newborn weighs 1.2 Kg. He is on TPN with 3 gms/kg protein. How do you calculate calories from protein?
      - $3 \text{ g/kg} \times 4 \text{ Kcal/g} = 12 \text{ kcal/kg}$

# Urine output

- Get the total urine volume in 24 hours and divide it by weight and by 24 hours  
= urine output in ml/kg/hr
  - Example
    - Newborn weighs 2.5 kg. His urine in the last 24 hours measured 150. Calculate urine output?
    - $150 / 2.5 = 60 / 24 = 2.5 \text{ ml/kg/hr}$
- If the infant is on IVF, we measure the total amount of urine
- If the Infant is NOT on IVF, we measure the total amount of void

# Stool output

- You will find a number of stools in the Input/Output tab
- For more details about stools, you will find this information in the flowsheet under NICU/NURSERY I/O
- If an infant has a stoma in place, you should calculate the output in ml/kg/day
  - Divide the total output in 24 hours by the weight

Flowsheets (completed rows are filtered out)

Summary | Chart Review | Results Review | Problem List | Intake/Output | **Flowsheets** | Notes | Growth Chart | Manage Orders | History | Rounding | Admission | Transfer | Discharge | Procedure | Consult | Medications | Patient Label ...

VS | PICU/NICU VS | NICU Daily Cares/Safety | Blood Admin | IV Assess | **NICU/NURSERY I/O** | Infant/NICU Assess

Jump To (Alt+Comma) | Print Breast Milk Labels | Hide All | Show All

Expanded | View All

	2140	2246
Weights		
Weight		
Estimated Dry Weight		
Drug Calculation Weight		
BSA (Calculated - sq m)		
Birth Weight		
Percent Weight Change Since Birth		
Intake		
Breast Feeding Occurrence		
Wt Gained At Breast Feeding (gm)		
Amt Maternal Breast Milk/bottle		
Amt Formula/Bottle (mL)		
Amt Maternal Breast Milk/Gavage		
Amt Formula/Gavage (mL)		
Amt Donor Breast Milk/Bottle		
Amt Donor Breast Milk/Gavage		
I.V.		
Blood		
Other		

Intake

breast milk ☒ Start: 05/20/19 0853

Nutrition ☒

dextrose 10 % with s... ☒ Start: 06/22/19 1130

fluconazole (DIFLUCA... ☒ Start: 06/14/19 1700

gentamicin (GARAMY... ☒ Start: 06/20/19 2230

cefePime (MAXIPIME... ☒ Start: 06/20/19 2100

Output ☒

Stool ☒

Urine ☒

Emesis ☒

Unmeasured ☒

NG/OG Tube (cm) Or... ☒

# Medications

- List all the medications that the patient is receiving

# Assessment

- Try to explain the major problems that the infants have in 1 sentence
- For example
  - This is a 3-day-old infant at 32w6d PMA with initial respiratory failure requiring CPAP, who now has comfortable respiratory effort in room air, and hypoglycemia requiring increased GIR and umbilical line placement.

# Plan

- System based
  - CV/Resp: Continuous CR and pulse oximetry monitoring, follow murmur clinically for now.
  - FEN/GI: Advance feeds of breast milk or donor milk 30 ml/kg/day, change TPN to D12 at 80 ml/kg/day, monitor electrolytes, glucose, and I/Os
  - HEME: serial CBC and bilirubin levels as needed
  - ID: no concern for infection, monitor clinically, send Urine CMV

The rotation description can be found in Dropbox

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