NCCC Feeding Pathway
1000-1250g Birth Weight AND ≥ 29 Weeks GA

Patient Name		Birth Weight *(grams)*	

Day of Pathway and Date [1]	Caloric Density of Human Milk [3,4,5] *(Kcal/30 mL)*	Total Enteral Intake *(per kg/day)*	Volume of Feeds [2] *(mL/kg/day)*	Weight 1. *BW (kg)* 2. *Current (If > BW)* 3. *Dosing weight*	Total Daily Feeding Volume *Desired volume (mL/kg/day) x weight*	Individual Feeding Volume [6] **(Given every 3 hours)** *Total daily volume ÷ 8*	Total Fluids [2] *(mL/kg/day)*	TPN / Fluid Changes [2] *(assuming CENTRAL access - for MD/ NP order)*	Comments *Colostrum should be used for Oral Immune Therapy (OIT) for the first week.*
Day 1 /	20	Kcal = 7 Protein = 0.1	10				80	Pro 3 g/Kg/d Lipid 1 g/Kg/d GIR 5.5 - 6	If arterial line in place, consider contribution of protein from fluids
Day 2 /	20	Kcal = 13 Protein = 0.2	↑**20**				90 - 100	Pro 3-3.5 g/Kg/d Lipid 2 g/Kg/d GIR 7 - 8	
Day 3 /	20	Kcal = 27 Protein = 0.4	↑**30** ↑**40 @ 2300**				110 - 120	Pro 3 g/Kg/d Lipid 1.5 g/Kg/d GIR 7 - 8	Consider decreasing electrolytes Days 3-5 in anticipation of transition to clear IVF
Day 4 /	↑**22**	Kcal = 44 Protein = 1.1	↑**50** ↑**60 @ 2300**				120 - 130	Pro 2.5 g/Kg/d Lipid 1 g/Kg/d GIR 7 - 8	Increase HM to 22 Kcal/oz using LHMF
Day 5 /	↑**24**	Kcal = 64 Protein = 2	↑**70** ↑**80 @ 2300**				130 - 140	Pro 2 g/Kg/d Lipid - D/C GIR 5 - 6	Increase HM to 24 Kcal/oz using LHMF
Day 6 /	24	Kcal = 80 Protein = 2.5	↑**90** ↑**100 @ 2300**				140 - 150	Clear IVF via PIV Max D12.5% GIR 3.5 - 4.5	***Discontinue central line, if appropriate.*** Consider custom fluid with electrolytes.
Day 7 /	24	Kcal = 96 Protein = 3.5	↑**110** ↑**120 @ 2300**				150 - 160	Clear IVF via PIV Max D12.5% GIR 2.5-3.5	Consider custom fluid with electrolytes
Day 8 /	24	Kcal = 112 Protein = 3.5	↑**130** ↑**140 @ 2300**					Discontinue IVF	Monitor glucoses as indicated
Day 9 /	24	Kcal = 120-128 Protein = 3.8-4	↑**150** ↑**160 @ 2300**						
Day 10 /	24	Kcal = 128 Protein = 4	160						Add Poly-Vi-Sol 0.25 mL twice daily
Day 14 /									Add Iron 3 mg/kg/day divided twice daily

1. **DAY OF PATHWAY:** Day 1 is considered the day feedings were started. Specify the date in the box provided. Document donor milk assent and fortification discussions as per the "**Pasteurized Human Donor Milk**" guideline.
2. *Individualize initiation, advancement rates, fortification, and total fluids based on patient's weight, age and clinical status.*
3. **CALORIC DENSITY OF HUMAN MILK:** Caloric density to be prepared for that day.
4. If human milk is unavailable or parents decline the use of donor human milk, use a premature 24 Kcal/oz formula (Similac Special Care 24) from Day 1. Document discussions regarding refusal of donor milk in the EMR.
5. **FORTIFICATION:** Continue donor milk until 36 weeks PMA. Fortify human milk feeds with liquid human milk fortifier (HMF).
6. **INDIVIDUAL FEEDING VOLUME:** Calculate by dividing the daily volume by 8**.** *Round this volume to the nearest 0.5 mL.*

NEWBORN CRITICAL CARE CENTER (NCCC) FEEDING GUIDELINES

PURPOSE

The purpose of this guideline is to improve feeding tolerance and to reduce parenteral nutrition days by providing a consistent approach to feeding. ***This guideline does not replace clinical judgment.***

BACKGROUND

- Prolonged fasting causes atrophy of the intestinal mucosa
- Human milk is well tolerated
- Intravenous access (especially central) increases infection risk and prolonged TPN increases cholestasis risk

INITIATION OF FEEDINGS

- Begin feedings with the appropriate feeding pathway per physician order
- Document donor milk assent as per the "**Pasteurized Human Donor Milk**" guideline.
- Infants may feed with umbilical lines in place.
- Human milk, especially mother's own milk, is preferred (colostrum for OIT and early feedings).
- Gavage feedings are given by infusion pump over 60 minutes unless otherwise ordered.

PROGRESSION OF FEEDINGS

- The bedside nurse will calculate the daily feeding volume and calories according to the appropriate feeding pathway.
- Document fortification discussions with the family as per the "**Pasteurized Human Donor Milk**" guideline.
- Transition of the type of fortification should be conducted as per the "**Guidelines for Transition Off Human Milk Fortified with Prolacta® and Transition Off Human Milk Fortified with HMF**."
- **Daily total fluids per physician order *should include all IV fluids and enteral feedings (including trophic feedings). TPN changes and total fluids listed in pathway are suggestions.***
- Oral medications should usually be avoided until full volume enteral feeds are tolerated.
- Check OG/NG tube placement per nursing protocol. Do not aspirate more gastric content than what is needed to confirm tube placement. **Do not check gastric residuals.**

WHEN TO NOTIFY MD/NP

- An abnormal/concerning abdominal exam including:
    - Abdominal distention (increase in abdominal circumference greater than 2 cm)
    - Visible bowel loops
    - Large or bilious emesis
    - Visible blood in stool
    - Unstable vital signs

DISCONTINUATION OF FEEDINGS

- A maximum of two consecutive feedings may be held by the intern or resident.
- Discontinue feedings only after evaluation by Attending MD, Neonatal Fellow, or Nurse Practitioner.

FEEDING INTERVAL EXCEPTIONS

- Consider continuous feedings (based on MD/NNP order) if infant exhibits persistent hypoglycemia, pathologic reflux, has GI motility/absorption issues (short gut, liver disease etc.) or does not appear to tolerate bolus feedings.

TRANSITION TO ORAL FEEDING

Goals:
- Transition to a safe pleasurable feeding experience.
- Transition to breast milk per the AAP guidelines, with a goal of 6 months of exclusive breast milk.
- Establish direct breastfeeding prior to hospital discharge.

For infants who are not breastfeeding, begin cue based bottle feeding when appropriate (infant medically stable, alert periods for at least 10 minutes, respiratory support equal to or less than 2L HFNC).

NCCC Feeding Pathway
1251 - 1500g Birth Weight OR < 34 Weeks GA with > 1500g Birth Weight

Patient Name | **Birth Weight *(grams)***

Day of Pathway and Date [1]	Caloric Density of Human Milk [3,4,5] *(Kcal/30 mL)*	Total Enteral Intake *(per kg/day)*	Volume of Feeds [2] *(mL/kg/day)*	Weight *1. BW (kg) 2. Current (If > BW) 3. Dosing weight*	Total Daily Feeding Volume *Desired volume (mL/kg/day) x weight*	Individual Feeding Volume [6] **(Given every 3 hours)** *Total daily volume ÷ 8*	Total Fluids [2] *(mL/kg/day)*	TPN / Fluid Changes [2] *(assuming PERIPHERAL access - for MD/ NP order)*	Comments *Colostrum should be used for Oral Immune Therapy (OIT) for the first week.*
Day 1 /	20		20				80	Pro 1.5-2 g/Kg/d Lipid 1 g/Kg/d GIR 4 - 5	
Day 2 /	20		↑**30** ↑**40 @ 2300**				100	Pro 1.5-2 g/Kg/d Lipid 1 g/Kg/d GIR 4 - 5	
Day 3 /	↑**22**	Kcal = 44 Protein = 1	↑**50** ↑**60 @ 2300**				110 - 120	Pro 1.5-2 g/Kg/d Lipid 1 g/Kg/d GIR 3.5 - 4.5	Increase HM to 22 Kcal/oz using LHMF
Day 4 /	↑**24**	Kcal = 64 Protein = 2	↑**70** ↑**80 @ 2300**				110 - 120	Clear IVF Max D12.5% GIR 2.5 - 3.5	Increase HM to 24 Kcal/oz using LHMF. Consider custom IV fluids with electrolytes.
Day 5 /	24	Kcal = 97 Protein = 2.5	↑**90** ↑**100 @ 2300**				130 - 140	Clear IVF Max D12.5% GIR 2.5 - 3.5	Consider custom IV fluids with electrolytes. **** If present, consider discontinuing central line.***
Day 6 /	24	Kcal = 96 Protein = 3	↑**110** ↑**120 @ 2300**					Discontinue IVF	Monitor glucoses as indicated
Day 7 /	24	Kcal = 112 Protein = 3.5	↑**130** ↑**140 @ 2300**						
Day 8 /	24	Kcal = 120 Protein = 3.8	↑**150**						
Day 9 /	24	Kcal = 128 Protein = 4	150 - 160						Add Poly-Vi-Sol 0.25 mL twice daily
Day 14 /									Add Iron 3 mg/kg/day divided twice daily

1. **DAY OF PATHWAY:** Day 1 is considered the day feedings were started. Specify the date in the box provided. Document donor milk assent and fortification discussions as per the "**Pasteurized Human Donor Milk**" guideline.
2. *Individualize initiation, advancement rates, fortification, and total fluids based on patient's weight, age and clinical status.*
3. **CALORIC DENSITY OF HUMAN MILK:** Caloric density to be prepared for that day.
4. If human milk is unavailable or parents decline the use of donor human milk, use a premature 24 Kcal/oz formula (Similac Special Care 24) from Day 1. Document discussions regarding refusal of donor milk in the EMR.
5. **FORTIFICATION:** Continue donor milk until 36 weeks PMA. Fortify human milk feeds with liquid human milk fortifier.
6. **INDIVIDUAL FEEDING VOLUME:** Calculate by dividing the daily volume by 8**.** *Round this volume to the nearest 0.5 mL.*

NEWBORN CRITICAL CARE CENTER (NCCC) FEEDING GUIDELINES

PURPOSE

The purpose of this guideline is to improve feeding tolerance and to reduce parenteral nutrition days by providing a consistent approach to feeding. ***This guideline does not replace clinical judgment.***

BACKGROUND

- Prolonged fasting causes atrophy of the intestinal mucosa
- Human milk is well tolerated
- Intravenous access (especially central) increases infection risk and prolonged TPN increases cholestasis risk

INITIATION OF FEEDINGS

- Begin feedings with the appropriate feeding pathway per physician order
- Document donor milk assent as per the "**Pasteurized Human Donor Milk**" guideline.
- Infants may feed with umbilical lines in place.
- Human milk, especially mother's own milk, is preferred (colostrum for OIT and early feedings).
- Gavage feedings are given by infusion pump over 60 minutes unless otherwise ordered.

PROGRESSION OF FEEDINGS

- The bedside nurse will calculate the daily feeding volume and calories according to the appropriate feeding pathway.
- Document fortification discussions with the family as per the "**Pasteurized Human Donor Milk**" guideline.
- Transition of the type of fortification should be conducted as per the "**Guidelines for Transition Off Human Milk Fortified with Prolacta® and Transition Off Human Milk Fortified with HMF**."
- **Daily total fluids per physician order *should include all IV fluids and enteral feedings (including trophic feedings). TPN changes and total fluids listed in pathway are suggestions.***
- Oral medications should usually be avoided until full volume enteral feeds are tolerated.
- Check OG/NG tube placement per nursing protocol. Do not aspirate more gastric content than what is needed to confirm tube placement. **Do not check gastric residuals.**

WHEN TO NOTIFY MD/NP

- An abnormal/concerning abdominal exam including:
    - Abdominal distention (increase in abdominal circumference greater than 2 cm)
    - Visible bowel loops
    - Large or bilious emesis
    - Visible blood in stool
    - Unstable vital signs

DISCONTINUATION OF FEEDINGS

- A maximum of two consecutive feedings may be held by the intern or resident.
- Discontinue feedings only after evaluation by Attending MD, Neonatal Fellow, or Nurse Practitioner.

FEEDING INTERVAL EXCEPTIONS

- Consider continuous feedings (based on MD/NNP order) if infant exhibits persistent hypoglycemia, pathologic reflux, has GI motility/absorption issues (short gut, liver disease etc.) or does not appear to tolerate bolus feedings.

TRANSITION TO ORAL FEEDING

Goals:
- Transition to a safe pleasurable feeding experience.
- Transition to breast milk per the AAP guidelines, with a goal of 6 months of exclusive breast milk.
- Establish direct breastfeeding prior to hospital discharge.

For infants who are not breastfeeding, begin cue based bottle feeding when appropriate (infant medically stable, alert periods for at least 10 minutes, respiratory support equal to or less than 2L HFNC).

NCCC Feeding Pathway
> 1500g AND ≥ 34 Weeks GA

Patient Name _____ **Birth Weight *(grams)*** _____

Day of Pathway and Date [1]	Caloric Density of Human Milk [3,4,5] *(Kcal/30 mL)*	Total Enteral Intake *(per kg/day)*	Volume of Feeds [2] *(mL/kg/day)*	Weight *BW (kg)*	Total Daily Feeding Volume *Desired volume (mL/kg/day) x weight*	Individual Feeding Volume [6] **(Every 3 hours)** *Total daily volume ÷ 8*	Total Fluids [2] *(mL/kg/day)*	IV Fluids [2,7] *(assuming PERIPHERAL access - for MD/ NP order)*	Comments *Colostrum should be used for Oral Immune Therapy (OIT) for the first week.*
Day 1 /	20	Kcal = 13-15 Protein = 0.2-0.4	20				80	D10% GIR 4.3	
Day 2 /	20	Kcal = 34-37 Protein = 0.5-1	↑**35** ↑**50 @ 2300**				100	D10% - D12.5% GIR 3.5 - 4.5	Consider custom IVF with electrolytes if indicated
Day 3 /	↑**22**	Kcal = 59 Protein = 0.9-1.7	↑**65** ↑**80 @ 2300**				110	D10% - D12.5% GIR 2 - 2.5	Increase to 22 kcal. See below for fortification instructions.
Day 4 /	22 or ↑**24**	Kcal = 81-88 Protein = 1.2-2.3	↑**95** ↑**110 @ 2300**				130	D10% - D12.5% GIR 1.5 - 2	Increase to 24 kcal. See below for fortification instructions.
Day 5 /	22 or 24	Kcal = 96-112 Protein = 1.4-2.7	↑**125** ↑**140 @ 2300**					Discontinue IV fluids	Monitor glucoses as indicated
Day 6 /	22 or 24	Kcal = 118-128 Protein = 1.8-3.4	↑**150** ↑160 @ 2300						Consider increasing feeds to 160 mL/kg/d for infants < 2000g
Day 14 /									Consult dietitian for appropriate MVI and Fe supplementation

1. **DAY OF PATHWAY:** Day 1 is considered the day feedings were started. Specify the date in the box provided. Document donor milk assent and fortification discussions as per the "**Pasteurized Human Donor Milk**" guideline.
2. *Individualize initiation, advancement rates, total fluids, and fortification based on patient's weight, age and clinical status.*
3. Infants < 36 weeks GA should usually receive donor milk. Those ≥ 36 weeks that are at an increased risk of NEC should be considered for donor milk (Examples: hx of NEC/SIP, gastroschisis, intestinal atresia, other intestinal anomalies, congenital heart disease) and may need a modified feeding advanced per the discretion of the clinical team.
4. **IF < 2000g:** Fortify human milk to max 24 kcal/oz with liquid HMF. If human milk is unavailable or family declines the use of donor human milk, initiate feeds with 22 kcal/oz formula (Neosure) and fortify to max 24 kcal/oz. Document discussions regarding refusal of donor milk in the EMR.
5. **IF < 36 weeks and ≥ 2000g:** Fortify human milk feeds with 22 kcal/oz formula powder (Neosure) to max 22 kcal/oz. If human milk is unavailable or family declines the use of donor human milk, initiate feeds with 22 kcal/oz formula (Neosure). Document discussions regarding refusal of donor milk in the EMR.
6. **IF ≥ 36 weeks and > 2000g:** If using this pathway for an infant ≥ 36 weeks whose clinical status precludes oral feeds, consider initiating/continuing feeds with unfortified human milk or term formula.
7. **INDIVIDUAL FEEDING VOLUME:** This is calculated by dividing the daily volume by 8**.** *Round this volume to the nearest 1 mL.*
8. If infant has a **CENTRAL LINE**, consider discontinuing when infant is tolerating at least 100 mL/kg/day of enteral feeds.

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