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FOUNDATION

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# THE BRAIN-PROTECTIVE GUIDE TO INFANT FEEDING



## FEEDING PLAN



I do not want my baby to  
lose greater than 7% of  
their birth weight.

Birth weight \_\_\_\_\_kg

7% wt. loss \_\_\_\_\_kg

$(BW \times 0.93)$

*ex.  $3\text{ kg} \times 0.93 = 2.79\text{ kg}$*

Patient: \_\_\_\_\_  
DOB: \_\_\_\_\_



# FEEDING PLAN FOR MY BABY

Name of baby: \_\_\_\_\_ DOB: \_\_\_\_\_

I wish to get assistance from my nurses, doctors and lactation consultants to achieve my feeding goals without risking my child's health. I am aware that the most common reason an exclusively breastfed (EBF) newborn is rehospitalized is due to problems with insufficient feeding. I am aware that 22% of mothers have been found to have delayed onset of copious milk production, which puts her child at 7-fold risk of complications. I wish to feed my child to optimize my feeding success and minimize the risks of feeding complications. Outlined below are my feeding goals and what I would like to do if problems arise during the course of my child's feeding.

## MY CURRENT RISK FACTORS FOR FEEDING COMPLICATIONS, PATHOLOGICAL JAUNDICE AND/OR REHOSPITALIZATION ARE THE FOLLOWING: [1][2][3]

<p><u>Risk Factors for Feeding Complications:</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> First-time mother</li> <li><input type="checkbox"/> Exclusive breastfeeding</li> <li><input type="checkbox"/> Cesarean section</li> <li><input type="checkbox"/> Complicated/prolonged labor &gt; 12 hrs</li> <li><input type="checkbox"/> History of low milk supply, delayed (&gt;72 hours) or failed lactogenesis II</li> <li><input type="checkbox"/> Pre-term baby (&lt; 37 weeks gestation)</li> <li><input type="checkbox"/> Small-for-Gestational-Age baby/IUGR</li> <li><input type="checkbox"/> Large-for-Gestational Age baby</li> <li><input type="checkbox"/> Diabetes</li> <li><input type="checkbox"/> Hypertension</li> <li><input type="checkbox"/> Obesity</li> <li><input type="checkbox"/> Smoking</li> <li><input type="checkbox"/> Hypothyroidism</li> <li><input type="checkbox"/> Hypopituitarism</li> <li><input type="checkbox"/> Polycystic ovarian syndrome</li> <li><input type="checkbox"/> Prior breast surgery/injury</li> <li><input type="checkbox"/> Minimal growth of breast tissue during pregnancy (breast hypoplasia), tubular or asymmetric breasts</li> <li><input type="checkbox"/> Infertility history</li> <li><input type="checkbox"/> Excessive blood loss during delivery or low blood pressure</li> <li><input type="checkbox"/> Psychosocial considerations that may interfere with nursing</li> <li><input type="checkbox"/> Retained placenta</li> </ul>	<p><u>Risk Factors for Pathological Jaundice or Hyperbilirubinemia:</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> First-time mother</li> <li><input type="checkbox"/> Exclusive breastfeeding</li> <li><input type="checkbox"/> History of low milk supply, delayed or failed lactogenesis II</li> <li><input type="checkbox"/> Rapid or excessive weight loss</li> <li><input type="checkbox"/> Prior history of jaundiced newborn</li> <li><input type="checkbox"/> Male gender</li> <li><input type="checkbox"/> Maternal age <math>\geq</math> 25</li> <li><input type="checkbox"/> Asian race</li> <li><input type="checkbox"/> Jaundice within the first 24 hours</li> <li><input type="checkbox"/> Jaundice before discharge</li> <li><input type="checkbox"/> Pre-term baby &lt; 37 weeks</li> <li><input type="checkbox"/> Gestation 37-38 weeks</li> <li><input type="checkbox"/> Large-for-Gestational Age baby</li> <li><input type="checkbox"/> Small-for-Gestational Age baby</li> <li><input type="checkbox"/> Blood type incompatibility, G6PD deficiency, other hemolytic disease</li> <li><input type="checkbox"/> Cephalohematoma or bruising and swelling on the scalp from birth</li> <li><input type="checkbox"/> Vacuum-delivery</li> <li><input type="checkbox"/> Discharge at 48 hours or less</li> </ul>
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Patient: \_\_\_\_\_  
 DOB: \_\_\_\_\_



I understand the risks of exclusive breastfeeding before onset of copious milk production include increased incidence and severity of jaundice, dehydration, excessive weight loss, hypernatremia, hypoglycemia and possible brain injury if my child gets insufficient breast milk. initial \_\_\_\_\_

I understand the risks of supplementation include insufficient breast milk supply if my child is supplemented without continuing the frequent breastfeeding (or self expression or bilateral breast pumping, if indicated) needed to stimulate milk production and theoretical changes to the gut microbiome. initial \_\_\_\_\_

**1. I wish to: (choose one)**

- Breastfeed while supplementing until my milk comes in, then exclusively breastfeed thereafter
- Exclusively breastfeed from birth
- Extended mixed-feeding with breast milk and formula (combo-feeding)
- Formula-feed exclusively

**2. I want to know the birth weight in kilograms at birth so that I may calculate the 4% and the 7% weight loss thresholds. 4% weight loss at 24 hours and 7% weight loss by 48 hours predicts the development of hyperbilirubinemia (>15 mg/dL), which may require treatment with phototherapy.[4] 7% is also the maximum weight loss recommended by the AAP.[5]**

Birth weight \_\_\_\_\_ kg  
4% weight loss \_\_\_\_\_ kg (BW x 0.96)  
7% weight loss \_\_\_\_\_ kg (BW x 0.93)

(No weight loss threshold protects a newborn from [hypoglycemia](#) and its negative effects on the brain. Only glucose checks and providing sufficient calories protects against hypoglycemia.)[6]

**3. I wish for my child to not lose greater than (select all that apply):**

- 4% by 24 hours
- 7% at any time
- I wish for my child to be supplemented to their satisfaction and lose as little weight as possible (supplementation must occur only after nursing to stimulate milk production)

**4. I wish for my child to be weighed and would like to know the percent weight loss with each weigh in to prevent excessive weight loss. The highest percentile weight loss in vaginally-delivered exclusively breastfed babies is 7% within 24 hours. [7]**

- Twice daily to closely monitor weight loss (*recommended for exclusively breastfed babies*)
- Once daily (*maybe sufficient for combo-fed and formula-fed babies*)

Patient: _____ DOB: _____
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**5. In order to avoid excessive weight loss, I would like assistance with learning how to feed my child on the first day.**

- Manual expression of breasts **before every feeding** to check for presence of milk (Video tutorial <http://newborns.stanford.edu/Breastfeeding/HandExpression.html>)
- Assistance with latch and position
- Assistance with hearing swallows to ensure intake of milk
- Assistance with learning how to pump my milk, especially if baby is sleepy at breast and is not actively breastfeeding every 2- 3 hours on both breasts for at least 10-15 minutes.
- A pre- and post-breastfeeding weight or "weighted feed" to measure the amount my child is gaining in a feeding session after my milk comes in
- I would like education on formula-feeding
- I would like education on combo-feeding

**6. In the event that my child reaches the 4% weight loss threshold by 24 hours, I would like to:**

- Express colostrum/transitional milk and feed it to my child by syringe
- If little to no milk is present, I would like to offer screened and pasteurized donor milk if available and if my child has medical indication for it (prematurity)
- If little to no milk is present, I would like to supplement my child with my preferred formula (see below)
- I would like assistance to assess the breastfeeding before supplementing
- I would like my pediatrician's opinion on supplementation

**7. In the event that my child reaches 7% weight loss at any time, I would like to:**

- Express colostrum/transitional milk and feed it to my child by syringe / spoon
- If little to no milk is present, I would like to offer screened and pasteurized donor milk if available and if my child has medical indication for it (prematurity)
- If little to no milk is present, I would like to supplement my child with formula
- I would like assistance to assess the breastfeeding before supplementing
- I would like my pediatrician's opinion on supplementation
- I would like a "weighted feed" to be done
- I would like an immediate glucose check

(Note: > 7% weight loss has been associated with the development of pathological hyperbilirubinemia and hypernatremia, which can cause brain injury and developmental disabilities)[4][8]

Patient: _____ DOB: _____
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8. **If I am exclusively breastfeeding**, to protect my baby's brain from insufficient milk intake, I would like my child to be monitored:

- Once daily transcutaneous bilirubin checks (or serum bilirubin test if necessary) (the [ABM](#) has cited that 10-18% of EBF newborns experience starvation jaundice from insufficient intake of milk)[9]
- Glucose monitoring per hospital protocol for high-risk babies (hypoglycemia in healthy, full-term, exclusively breastfed babies has been shown to occur in 1 in 10 babies overall and 1 in 4 first-born babies in the first 48 hours)[10]

9. **If my child appears hungry and unsatisfied at the breast:**

- I would like an immediate glucose checks and supplementation to maintain a normal glucose above 50 mg/dL. (Note: 47 mg/dL is the only prospectively validated glucose level that has been shown to protect newborns from developing long-term developmental delay. [11] The Pediatric Endocrine Society recommends a threshold of > 50 mg/ dL in the first 48 hours and > 60 mg/dL thereafter)
- I would like assistance with manual expression to evaluate for presence of milk
- I would like to supplement with my own breast milk first
- I would like to supplement with screened and pasteurized donor milk if available to my child
- I would like to supplement with formula
- I would like to supplement until my child is satisfied and no longer crying or lethargic (15 mL at a time)
- I would like to supplement only after nursing sessions to continue stimulation of milk production.

\*The size of the newborn stomach at birth has been found to be 20 mL, much larger than the volumes per feed previously published by the Academy of Breastfeeding Medicine.[12]

10. **If I am supplementing, I would like to supplement by:**

- Syringe
- Spoon
- Supplemental nursing system
- Bottle (slow-flow, nursing-friendly preferred if breastfeeding)

11. **If I am supplementing, I would like to supplement with:**

- Screened and pasteurized donor milk if available to my child
- Elemental formula
- Hydrolyzed formula
- Standard formula

12. **Other preferences:**

Patient: _____ DOB: _____
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- No pacifiers
- I want a pacifier for my baby and understand the possibility of nipple confusion or decreased desire to suckle directly at the breasts
- Rooming-in with my baby
- Option to sleep during the day / night by sending my child to the nursery so I may recover from delivery for the safety of my baby
- No bed-sharing while breastfeeding to avoid suffocation.
- I do not want to be left alone while breastfeeding in bed, while recovering to avoid accidental suffocation.
- I do not want to be left alone while doing skin-to-skin, while recovering to avoid accidental suffocation (falling asleep, immobility, pain medication effect)

I wish to feed my child in the best way that I can and to reach my feeding goals without risking any harm and rehospitalization. Please help me reach my feeding goals and help protect my child from the dangers of underfeeding.

I have additional concerns and requests:

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Respectfully,

Signature

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Mother's name

Disclaimer: This document does not replace in-person physician evaluation and treatment. This document is meant to inform parents of the most recent data regarding infant feeding and to increase their knowledge on how to protect their newborns from hyperbilirubinemia, dehydration, hyponatremia, hypoglycemia and extended or repeat hospitalizations due to complications from underfeeding. Earlier supplementation may be needed for babies who are premature or have medical conditions. It is recommended that a parent seeks evaluation by a pediatrician for any concerns regarding the health and safety of her baby if they arise.  
initial \_\_\_\_\_

Note: Many errors can be made when using pounds and ounces for weight. You can convert pounds and ounces to kilograms with the following equation: (Weight in lbs + ounces/16) divided by 2.2 = weight in kilograms. Or go to the following weight converter:

[http://www.retrowow.co.uk/retro\\_britain/old\\_money/pounds\\_to\\_kilograms.html](http://www.retrowow.co.uk/retro_britain/old_money/pounds_to_kilograms.html)

**TRACKING BABY TO PROTECT THE BRAIN**

Patient: _____ DOB: _____
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Hours/ Time	Birth	12 hrs	24 hrs	36 hrs	48 hrs	60 hrs	72 hrs
Glucose (Normal > 50 mg/dl)							
Bilirubin* (see chart)							
Weights# (kg)/% loss							

\*To calculate the bilirubin risk category, please go to <http://bilitool.org> or the see last page.

#To calculate the percent weight loss, go to <https://www.newbornweight.org>.

**Percent weight loss = (Birth weight - current weight)/birth weight x 100%)**

## HOW TO SUPPLEMENT AFTER NURSING TO CONTINUE THE STIMULATION NEEDED FOR MILK PRODUCTION

*Please consult with a lactation consultant, nurse or breastfeeding educator to optimize breastfeeding technique. Medical necessity for supplementation is primarily based on the judgment of a pediatrician, who is the only person qualified to protect your child's brain from underfeeding. **However, the person with the ultimate authority over supplementation is the mother.** Early limited supplementation after nursing has been shown to DOUBLE the rates of exclusive breastfeeding at 3 months for underfed babies, relative to those who are not supplemented.[13]*

1. **Manually express your breasts to check for presence of breast milk.**
2. Breastfeed your baby with optimal latch and positioning for 20-30 minutes every 2-3 hours while assisting your baby through manual expression of your breasts. (see Stanford Video Tutorial)
3. If your child needs supplementation, you may do so with either expressed breast milk, donated screened and pasteurized breast milk, if available, or formula. This can be done through the following methods.
  - a. Supplementing 12 mL at a time with a periodontal syringe slipped into the corner of baby's mouth while baby is latched at the breast.
  - b. Supplementing 15 mL at a time with a supplemental nursing system, a tube taped to the nipple or slipped into the mouth while baby is latched at the breast.
  - c. Bottle-feeding 15 mL at a time, ideally through a slow-flow, nursing-friendly bottle.
4. Burp baby after each 15 mL feeding to prevent gas and regurgitation.
5. Supplement until indications for supplementation and newborn distress are resolved.

Please note that wet and dirty diaper counts are not tracked on this feeding plan because they have not been shown to have any correlation with actual breast milk intake or prevention of excessive weight loss.[14] It is important to track eliminations on the hospital records to be sure your baby is eliminating normally.

### CLINICAL SIGNS OF NEWBORN HYPOGLYCEMIA which causes brain injury if uncorrected

Patient: _____ DOB: _____
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(< 50 mg/dL per the [Pediatric Endocrine Society Guidelines, March 2015](#)) *From Early to Late*

- 10% of EBF babies and 23% of first-born EBF babies have hypoglycemia with no symptoms
- Jitteriness or shakiness, especially with hands
- Prolonged and unsatisfied nursing (>45 minutes)
- Baby wants to nurse constantly, heightens after 24 hours of life
- Inconsolable and high-pitched crying despite nursing
- Low body temperature
- Having weak muscle tone
- Being very sleepy or difficult to arouse
- Falling asleep at breast after a few suckles or needs constant stimulation for a satisfactory breastfeeding session
- Seizures (eyes rolling back in head or jerking rhythmic motions)
- Blueness of skin, usually starting around the mouth
- Poor breathing or cessation of breathing

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[1] [Recognizing and Treating Delayed or Failed Lactogenesis II](#). Nancy M. Hurst, RN, DSN, IBCLC. *J Midwifery Womens Health*. 2007;52(6):588-594.

[2] [Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation. Subcommittee on Hyperbilirubinemia](#). *Pediatrics*, July 2004, 114 (1): 297-316

[3] [Predicting Nonhemolytic Neonatal Hyperbilirubinemia](#). Norman, M, et al. *Pediatrics*. 2015 Dec;136(6):1087-94. doi: 10.1542/peds.2015-2001. Epub 2015 Nov 9.

[4] [Bodyweight loss in predicting neonatal hyperbilirubinemia 72 hours after birth in term newborn infants](#). Wen-Chieh Yang et al., *BMC Pediatrics* 2013, 13:145

[5] [Breastfeeding and the Use of Human Milk](#). AAP Breastfeeding Section, *Pediatrics*, March 2012, Volume 129 (3): e827-e841.

[6] [Late-Onset Hypoglycemia in Term Newborns With Poor Breastfeeding](#). Laura M. Seske, et al. *Hospital Pediatrics* Sep 2015, 5(9) 501-504

[7] [Early weight loss nomograms for exclusively breastfed newborns.](#), Flaherman VJ et al. *Pediatrics*. 2015 Jan;135(1):e16-23.

[8] [Moderate hypernatremic dehydration in newborn infants: retrospective evaluation of 64 cases](#). Uras N et al. *J Matern Fetal Neonatal Med*. 2007 Jun;20(6):449-52.

[9] [ABM Clinical Protocol #22: Guidelines for Management of Jaundice in the Breastfeeding Infant Equal to or Greater Than 35 Weeks' Gestation](#) BREASTFEEDING MEDICINE 2010. 5 (2): 87-93

[10] [Study of Asymptomatic Hypoglycemia in Full Term Exclusively Breastfed Neonates in First 48 Hours of Life](#). Purnima Samayam, et al. *J Clin Diagn Res*. 2015 Sep; 9(9): SC07–SC10. Published online 2015 Sep 1.

[11] [Neonatal Glycemia and Neurodevelopmental Outcomes at 2 Years](#). Christopher J.D. McKinlay, Ph.D., et al. *N Engl J Med* 2015;373:1507-18. DOI: 10.1056/NEJMoa1504909

[12] [Neonatal stomach volume and physiology suggest feeding at 1-h intervals](#). Bergman NJ. *Acta Paediatr*. 2013 Aug;102(8):773-7. [13] [Effect of early limited formula on duration and exclusivity of breastfeeding in at-risk infants: an RCT](#). Flaherman, V.J., et al. (2013). *Pediatrics*, 2013. 131: 1059–1065.

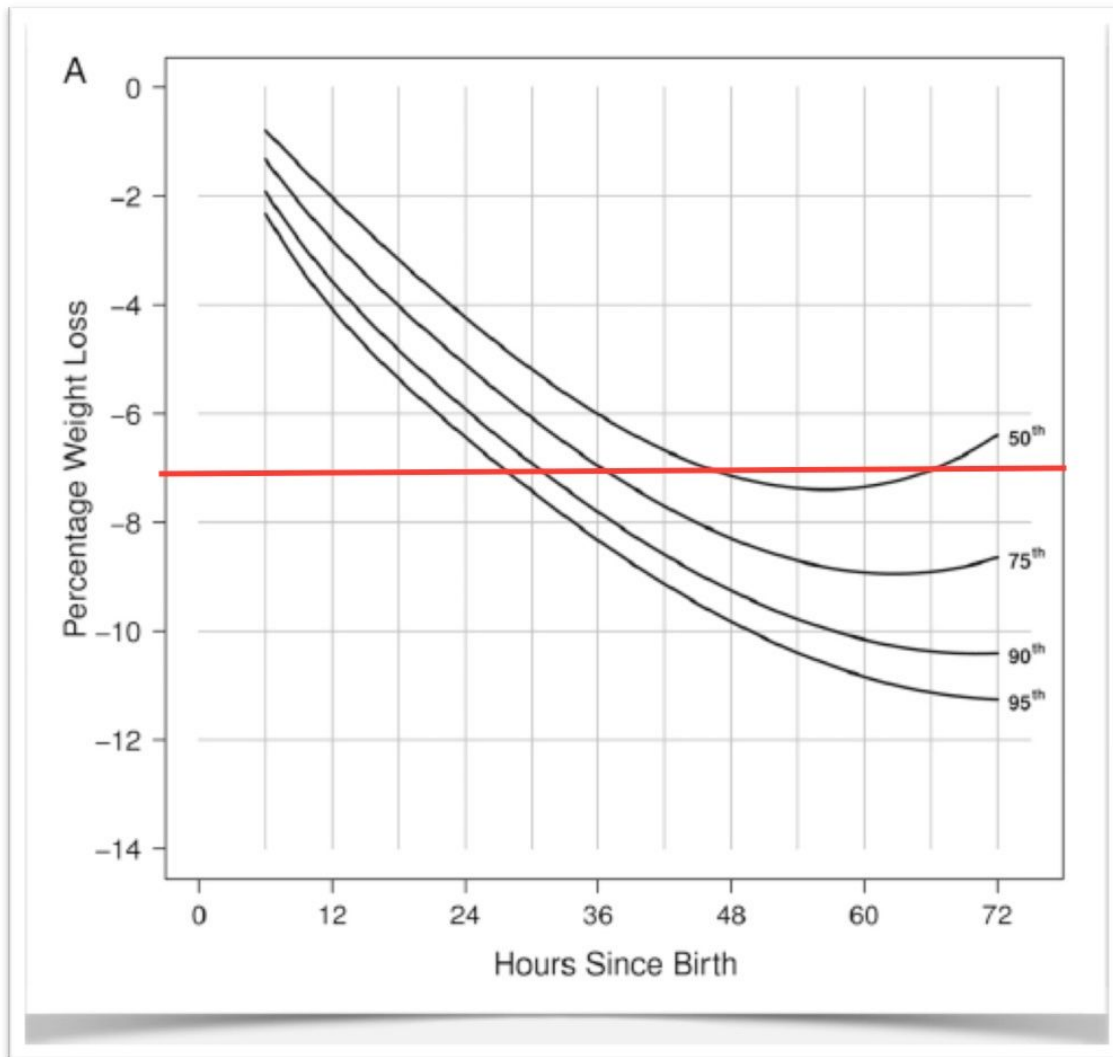
[14] [Newborn Wet and Soiled Diaper Counts and Timing of Onset of Lactation as Indicators of Breastfeeding Inadequacy](#). Laurie A. Nommsen-Rivers, PhD, et al. *J Hum Lact* 24(1), 2008

Patient: _____
DOB: _____



## WEIGHT LOSS NOMOGRAM FOR EXCLUSIVELY BREASTFED VAGINALLY-DELIVERED NEWBORNS [7]

(Red line indicates 7% threshold)



To calculate the newborn weight loss percentage, go to <https://www.newbornweight.org>

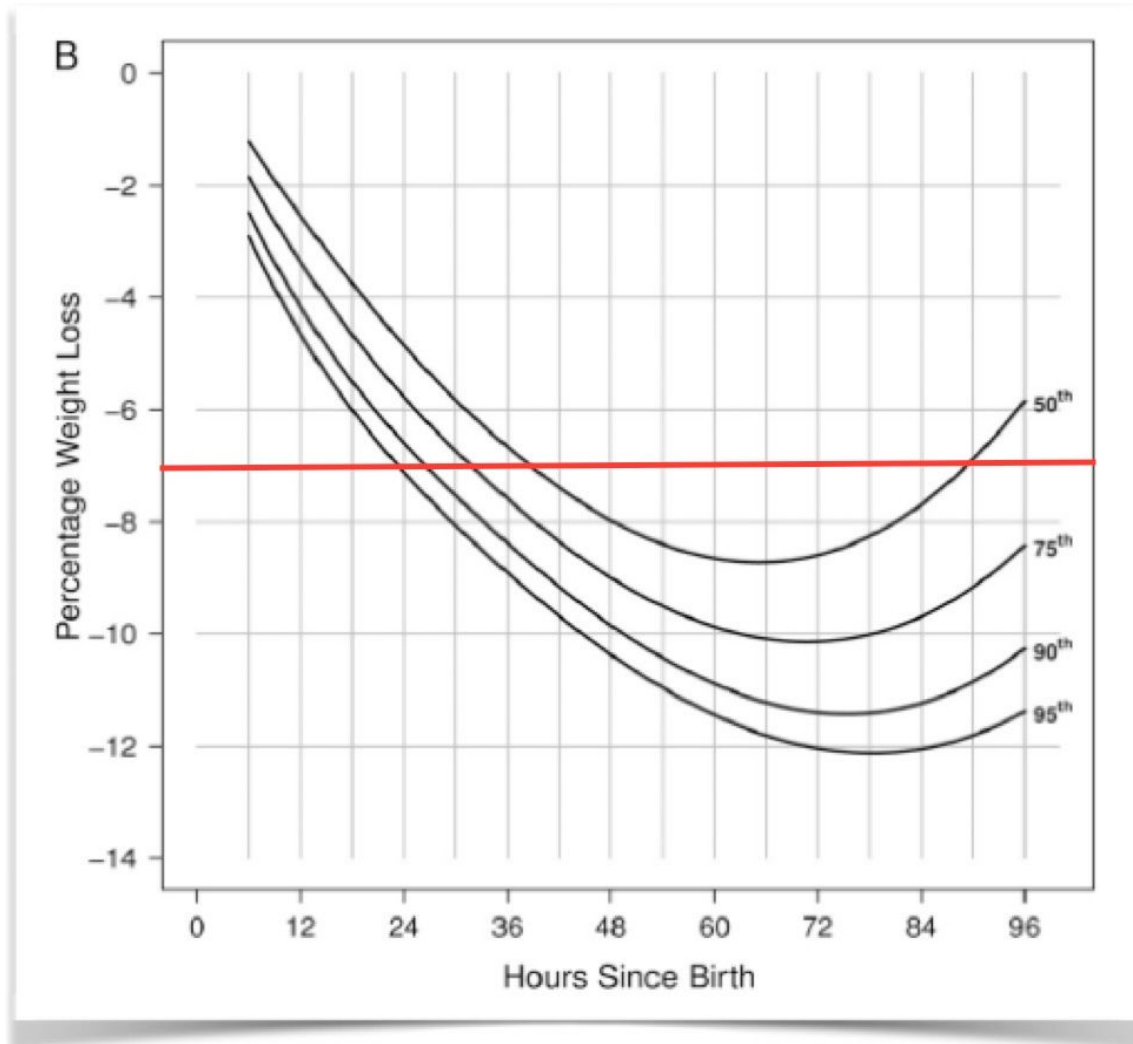
Note: This weight loss nomogram has not been tied to clinical outcomes. Therefore, a child at the 50% percentile can still experience complications like hyperbilirubinemia and hypoglycemia. Every child has their own tolerance for weight loss. A child that is crying inconsolably and displaying signs of distress may in fact require supplementation sooner than 7%.

Patient: \_\_\_\_\_  
DOB: \_\_\_\_\_



## WEIGHT LOSS NOMOGRAM FOR EXCLUSIVELY BREASTFED CESAREAN DELIVERED NEWBORNS [7]

(Red line indicates 7% threshold)



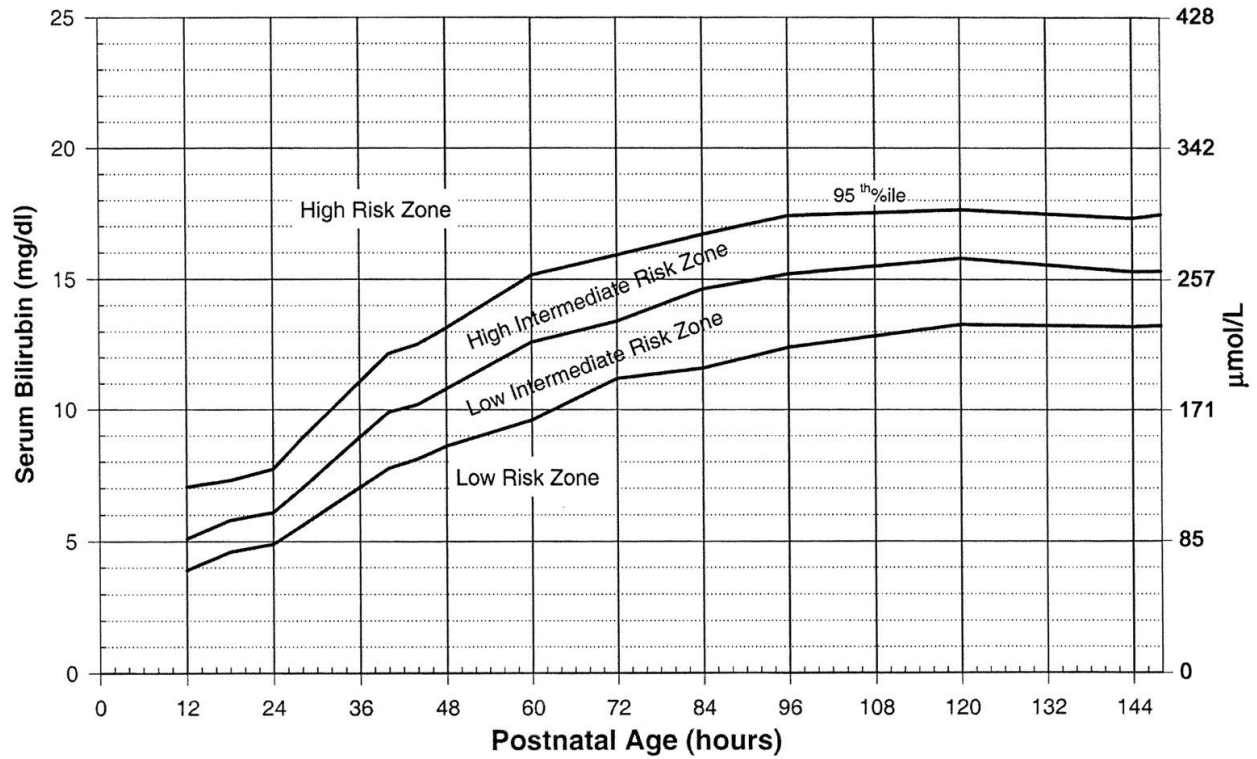
To calculate the newborn weight loss percent, go to <https://www.newbornweight.org>

Note: This weight loss nomogram has not been tied to clinical outcomes. Therefore, a child at the 50% percentile can still experience complications like hyperbilirubinemia and hypoglycemia. Every child has their own tolerance for weight loss. A child that is crying inconsolably and displaying signs of distress may in fact require supplementation sooner than 7% weight loss.

Patient: \_\_\_\_\_  
DOB: \_\_\_\_\_



# SERUM BILIRUBIN NOMOGRAM BY HOUR



\*To calculate the bilirubin risk category on the Bhutani nomogram, please go to <http://bilitool.org>

Patient: \_\_\_\_\_  
DOB: \_\_\_\_\_