

Categorizing Weight Loss in Breastfed Infants: A Good First Step

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One of the most gratifying public health trends over the past 50 years in the United States has been the increasing rate of breastfeeding among newborn infants. In 1965, it was estimated that <30% of neonates born in the United States were breastfed; by 2011, the percentage of infants who were at least partially breastfed had risen to 79%.^{1,2} A major focus of contemporary care during the birth hospitalization is the management of breastfed infants. Although much effort is centered on the provision of optimal instruction and support to mothers initiating breastfeeding, an equally important goal is to appropriately diagnose and manage newborns with breastfeeding difficulties.

The results of the study by Flaherman et al in this issue of *Pediatrics* provide much needed data for both of these efforts.³ Using a large database and an elegant methodology, Dr Flaherman and her colleagues have constructed nomograms that describe weight loss in breastfed infants during the first few days of life. With the nomograms, clinicians can plot the percent weight loss for a neonate at a specific age and determine, with precision, whether this percentage is normal for a breastfed newborn (eg, at the 50th percentile) or excessive (eg, ≥ 95 th percentile). Although these assessments have been done informally for many years in newborn nurseries, the new nomograms provide much-needed rigor.

These nomograms effectively create “reverse” growth charts for breastfed infants during the first few days of life. With their nomograms, Flaherman et al have, literally, normalized weight loss in breastfed infants. The data can be

used to allay the anxiety of a new mother. For instance, rather than informing a mother that her breastfed infant, born by vaginal delivery, is “down 7%” at 48 hours of life, the same information can be rephrased as “normal” (ie, at the 50th percentile on the nomogram), much as we assure parents of older children that weight gain is normal by using standard growth charts.³ More important, using the nomograms, neonates with significant breastfeeding problems may be identified because their weight loss is ≥ 95 th percentile for age or because the trajectory of weight loss is atypical.

It is reassuring that many of the results of the analysis by Flaherman et al are consistent with data from previous studies. For example, these investigators found that the nadir in weight for neonates at the 50th percentile on their nomograms occurred at ~ 60 hours of age.³ This is similar to data from MacDonald et al and Marchini and Stock, who reported that the nadir occurred on the third day of life.^{4,5}

The nomogram data for weight loss in neonates born by cesarean delivery are jarring, with Flaherman et al reporting that 25% of these newborns have a weight loss $\geq 10\%$.³ It is important to note that in the current data analysis, many of the study infants who were born by vaginal delivery were discharged before their nadir in weight.³ Because no data were collected on newborns after hospital discharge, the true prevalence of weight loss $\geq 10\%$ in their vaginal delivery population was not determined and was almost certainly higher than the rate they report.

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Opinions expressed in these commentaries are those of the author and not necessarily those of the American Academy of Pediatrics or its Committees.

www.pediatrics.org/cgi/doi/10.1542/peds.2014-3354

DOI: 10.1542/peds.2014-3354

Accepted for publication Oct 24, 2014

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

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FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

FUNDING: No external funding.

POTENTIAL CONFLICT OF INTEREST: The authors have indicated they have no potential conflicts of interest to disclose.

COMPANION PAPER: A companion to this article can be found on page e16, online at www.pediatrics.org/cgi/doi/10.1542/peds.2014-1532.

Flaherman et al suggest that their data on weight loss can be used to diagnose and manage breastfeeding problems in a fashion similar to how the “Bhutani nomogram” is used to manage infants with hyperbilirubinemia.³ Unfortunately, this is not a perfect analogy. The Bhutani nomogram was designed to identify newborns at risk for developing a significantly elevated bilirubin level (eg, ≥ 17 mg/dL at 84 hours of life), so that follow-up can be planned and therapy initiated to prevent the bilirubin rising to levels known to be dangerous.⁶ There is no such evidence-based and clinically relevant outcome for defining abnormal weight loss in breastfed infants. Flaherman et al classified weight loss in breastfed newborns as “excessive” when it was $\geq 10\%$ of birth weight.³ Although this definition is widely used clinically, it is somewhat arbitrary.⁷ “Excessive” weight loss might best be defined as the percent weight loss at which interventions (eg, formula supplementation) should be initiated to prevent short- and long-term harm to the breastfed infant while continuing to promote long-term breastfeeding. Whether these goals are best realized if interventions are initiated when an infant has lost $<10\%$ of his or her birth weight or

not until the weight loss is substantially $>10\%$, is largely unknown.

Perhaps a better analogy for the weight loss nomograms is the 2011 guideline for management of newborn hypoglycemia.⁸ In the guideline, detailed guidance for identifying and treating neonates with a glucose level <45 mg/dL is provided even though, as explicitly stated by the guideline authors, the clinical relevance of this cutoff value for defining hypoglycemia is not clear.⁸ Similarly, although it is likely that the weight loss nomograms will be widely used by clinicians managing breastfed infants during their birth hospitalization, whether this use will lead to better outcomes is currently unknown. Rather than a criticism of the study by Flaherman et al, this is an acknowledgment of the need for more research. The next step is to use the nomograms to characterize weight loss in a group of newborns and link specific patterns of weight loss with relevant outcomes.

REFERENCES

1. Centers for Disease Control and Prevention. Breastfeeding Report Card, 2014. Available at: <http://www.cdc.gov/breastfeeding/pdf/2014breastfeedingreportcard.pdf>. Accessed October 10, 2014
2. Ryan AS, Pratt WF, Wysong JL, Lewandowski G, McNally JW, Krieger FW. A comparison of breast-feeding data from the National Surveys of Family Growth and the Ross Laboratories Mothers Surveys. *Am J Public Health*. 1991;81:1049–1052
3. Flaherman VJ, Schaefer EW, Kuzniewicz MW, Li SX, Walsh EM, Paul IM. Early weight loss nomograms for exclusively breastfed newborns. *Pediatrics*. 2015;135(1). Available at: www.pediatrics.org/cgi/content/full/135/1/e16
4. Marchini G, Stock S. Thirst and vasopressin secretion counteract dehydration in newborn infants. *J Pediatr*. 1997;130(5):736–739
5. Macdonald PD, Ross SR, Grant L, Young D. Neonatal weight loss in breast and formula fed infants. *Arch Dis Child Fetal Neonatal Ed*. 2003;88(6):F472–F476
6. Bhutani VK, Johnson L, Sivieri EM. Predictive ability of a predischarge hour-specific serum bilirubin for subsequent significant hyperbilirubinemia in healthy term and near-term newborns. *Pediatrics*. 1999;103(1):6–14
7. Chantry CJ, Nommsen-Rivers LA, Pearson JM, Cohen RJ, Dewey KG. Excess weight loss in first-born breastfed newborns relates to maternal intrapartum fluid balance. *Pediatrics*. 2011;127(1). Available at: www.pediatrics.org/cgi/content/full/127/1/e171
8. Adamkin DH; Committee on Fetus and Newborn. Postnatal glucose homeostasis in late-preterm and term infants. *Pediatrics*. 2011;127(3):575–579

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Pediatrics 2015;135:e174

DOI: 10.1542/peds.2014-3354 originally published online December 1, 2014;

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