



**Reference:** B. Alshaikh, K. Yusuf, D. Dressler-Mund, A. A. Mehrem, S. Augustine, J. Bodani, et al., Rates and Determinants of Home Nasogastric Tube Feeding in Infants Born Very Preterm. *J Pediatr*, 2022. 246: p. 26-33.e2.

**url:** <https://pubmed.ncbi.nlm.nih.gov/35301017/>

Welcome to the May 2022 Research Round-up. This month we will look at an article entitled " Rates and Determinants of Home Nasogastric Tube Feeding in Infants Born Very Preterm." This article was published in 2022 in the Journal of Pediatrics. I picked this because my NICUs do not send babies home with NG-Tubes but clearly this is becoming more common, and I was interested in knowing more. Click on the URL above to go to the full text. Remember to download the handouts "Critical Review of the Literature" and the Research Roundups definitions file if you need information on any of the abbreviations used. We will go through this article to better understand what was done and what we can draw from this study.

**Title:** The title accurately describes the study.

**Abstract:** The abstract summarizes the objective, study design, results, and conclusion of the study.

**Background or Introduction:** We once again start with looking at the references, with <2012, or published  $\geq$  2012 as our separation window. For the entire article, there are 40 references; of these, 13 references were published prior to 2012 and 27 published in 2012 or later. The ones that are earlier than 2012 include statistical analyses papers. In the background section, of the 15 articles cited, 5 were published prior to 2012.

The authors begin with a statement of how feeding is challenging for preterm infants, and how it contributes to length of stay. Historically, G-Tubes were placed in infants who struggled to reach full oral feedings; NG-Tube placement has become more common. The authors focus on the more natural environment of home, as well as the cost savings when infants are at home. They then discuss that feeding and swallowing assessments are indicated for "fragile feeders" to determine safety of oral feeding and promote improvement in sucking, coordination, and endurance. They feel that identifying determinants of "home tube feeding" can help recognize at-risk infants sooner, to proceed with early referral to aerodigestive programs and plan for early discharge and family counseling. This leads to their objective statement. The objectives were to identify rates of home NG-tube and G-tube feedings in infants discharged from NICUs in Canada, and to identify factors that may predict "delayed acquisition of oral feeding skills".

**Study Population:** This study was a multi-center retrospective study using data from the Canadian Neonatal Network (CNN), which houses data from tertiary-level NICUs in Canada. The population included infants born <33 weeks gestational age, admitted between Jan 1, 2010, and Dec 31, 2018. At the start of the period there were 25 NICUs; by 2018 there were 31. They excluded major congenital anomalies, deaths, and transfers. They focused on NG-Tube placements and only used G-Tube placements as a comparison. A total of 134,041 infants were admitted during this time to a hospital NICU within the CNN. Of the total, 38,876 were under 33 weeks gestation.

**Methodology:** All data was already transferred to the CNN, so this was a database study. Variables were defined by the CNN manual, as this database is used for multiple studies. They collected birth data, maternal data, and hospital data for analysis.

**Statistical Analysis:** Data analysis included descriptive data for the study population. They looked at the trend of NG-Tube discharge using Cochran-Armitage test. Chi-squares were used, along with students t-test or Wilcoxon rank-sum tests, for determinants. They also used a more sophisticated multiple variable logistic regression model with generalized estimating equation approach to look at how strongly the dependent variables were associated.

**Outcomes/Results:** The primary outcome was rate of home NG-tube feeding (NG-Tube compared to oral feeding). The authors also aimed to examine institutional variation in rates of NG- and G-Tube feedings. The secondary outcome was to identify determinants of the method of feeding on the day of discharge. A large number (25, 644) were excluded for reasons listed by the authors, leaving 13,232 infants in the data set for this study. Recall large numbers will make statistical significance easier to attain. Of these, 12,899 (96.9%) went home orally feeding, 333 (2.5%) with NG-Tubes and 85 (0.6%) with G-Tubes. NG-Tube home feeding was seen more often (4.8%) in the younger infants (<28 weeks gestation). Across the various NICUs, rates ranged from 0% to 12%. NG-Tube discharge increased over the period of the study, but G-Tube placements did not increase. Infants who discharged with NG-Tubes were 5.2 weeks older on average than infants discharging fully orally feeding. Birth factors associated with risk of discharging with NG-Tubes for home included younger gestational age, SGA, poor SNAP-II scores, severe brain injury and longer duration of mechanical ventilation. Of these, BPD was the strongest predictor of home NG-Tube feeding. Females discharged more often with NG-Tubes than males. Hospital factors associated with G-Tubes discharge included NEC and other GI complications, severe brain injury, and BPD. These infants also had longer hospitalizations.

**Discussion/Conclusions:** The authors begin their discussion by recapping their results, and the disparities across NICUs in rates of NG-Tube at discharge. They then go into a lovely discussion about how the existing data are limited for rates of NG-Tubes for discharge; we have even less data on outcomes post-discharge. They then do a very nice review of the challenges faced by infants' post-discharge, with about 40% of infants showing some feeding problems in the first year. The authors compare their study with other outcome studies. Apart from this study showing a lower risk for male infants, most of their results were similar to other studies. They discuss their finding of longer hospital stay and NG-Tube placement. Their hypothesis is that discharge home with NG-Tube appears to be a "last resort" within the network hospitals. The authors make their case that discharge home could be beneficial for parent-infant relationships and cite five studies that support their case.

The authors do an impressive job of describing the strengths and the limitations of their study. These limitations primarily focused on the limitations of retrospective database studies. But they also included the fact that they did not evaluate long-term feeding outcomes. The authors conclude their paper by stating that it might be helpful to identify infants early to help anticipate need for NG-tube feeding at home, to plan and optimize supports to do so.

**Does this fit with your experience:** Yes and no. My hospital does not discharge infants home with NG-Tubes. We are very focused on normal development. In their conclusions, the authors highlight a study that sent infants home in the 35<sup>th</sup> week gestation. I would argue against that – since most infants would not be fully orally fed based on normative data. But I think it is worth considering whether infants who reach 37 or 38

weeks might benefit from home discharge with NG-Tube feedings. I would caution this only be done with a strong medical/therapy support system in place. What about you? What do you think?

**Other:** The authors report conflicts of interest to disclose. The original article has the research approvals listed. Data collection from each participating NICU were approved by each hospital's local Research Ethics Board or Quality Improvement Committee. Specific approval for this study came from the University of Calgary Conjoint Health Research Ethics Board and from the Executive Committee of the CNN