National Trends in Feeding Interventions for Cleft Palate
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SYNOPSIS
Infants with orofacial clefts usually have feeding difficulties, however some thrive with the use of specialized bottles while others require surgical gastrostomy. A large study examining failure to thrive and feeding tube placement in these infants has not been performed. This study determines national rates of failure to thrive and gastrostomy tube placement among children under 2 years of age with cleft lip and/or palate and identifies specific risk factors for requiring hospitalization and surgical intervention.

FINDINGS: Failure to thrive is a common problem among infants and toddlers with clefts, with rates approaching 20%. Children with gastrointestinal, cardiac, and respiratory co-morbidities are particularly at risk. Gastrostomy tube placement for feeding supplementation may be required in those infants with poor tone, cardiac anomalies, and airway concerns, with those children suffering from reflux symptoms most at risk.

METHODS
A retrospective study was performed using a national pediatric data set. The Kids’ Inpatient Database 2006 samples 3,331,324 pediatric discharges from 3,739 hospitals in 38 states. This database was analyzed for children under 2 years of age with any form of cleft lip and/or palate (International Classification of Diseases, Ninth Revision (ICD-9) codes: 750.0-750.4, 750.9-751.9, 752.0-752.9) and with and without the diagnosis of FTT (ICD-9 codes: 260.3, 260.4, 260.5, 261.5, 773.5, 797.3, 798.3, 783.41). The cohort of children with cleft palate and FTT were analyzed for procedure codes indicating gastrostomy placement during admission (PR: 4311, 4319, 4432). Additional diagnoses and co-morbidities were noted for each patient and a multivariate relative risk analyses performed.

RESULTS
In total, 12,007 children under 2 years of age with cleft lip and/or palate were identified (56% female). Of these, 2,265 (17%) also had the diagnosis of FTT. Children with orofacial clefting and FTT had a g-tube placement rate of 18%, with the overall rate of g-tube placement for any child under 2 years with a cleft being 3%. Children under 1 year of age with isolated cleft palate had a 23% rate of FTT compared to a 13% rate seen in similar infants of the same age without clefting (see Figure 1). G-tube placement rate in infants under 1 year with isolated cleft palate was 1.5%; twice that of infants under 1 year without clefting (0.75%) (see Figure 2).

Odds of FTT among infants with clefts were significantly elevated for those with reflux (OR 4.1, 95% CI: 3.4-4.5), muscular-esophageal anomalies (OR 2.9, 95% CI:2.4-3.5), septal defect (OR 2.9, 95% CI:2.4-3.5), venricular septal defect (OR 2.9, 95% CI:2.4-3.5), muscular-esophageal anomalies (OR 2.4, 95% CI:1.9-2.9), and respiratory problems after birth (OR 2.3, 95% CI:1.9-3.0). Female gender was slightly protective for FTT (OR 0.8, 95% CI:0.7-0.9) (see Figure 3). Elevated odds ratios for g-tube placement in those infants with cleft lip and/or palate and FTT were found in those with congenital diagnoses of reflux (OR 3.9, 95% CI:2.9-4.4), muscular-esophageal anomalies (OR 20.9, 95% CI:4.2-4.8), aneurysmal septal defect (OR 1.7, 95% CI:1.2-2.6), venricular septal defect (OR 1.8, 95% CI:1.2-2.5), and respiratory problems after birth (OR 1.6, 95% CI:1.1-2.4). There was also a two-fold elevation in odds ratios for g-tube placement in a teaching hospital (OR 2.1, 95% CI:1.5-3.0) (see Figure 4).

DISCUSSION (cont.)
Most infants with cleft palate experience dysphagia owing to an inadequate suck, which is necessary for successful nursing or bottle-feeding. If failure to thrive develops in these children, supplementation with nasogastric feeding becomes necessary. This may serve as a temporary measure or may indicate a more significant degree of dysphagia that merits surgical intervention. Complications of gastrostomy include gastroesophageal reflux, sternal infection, formation of granulation tissue, tube dislodgement, subcutaneous fistulae, and oral aversion.2 It is therefore of utmost importance to determine which patients merit surgical intervention versus those that may be able to avoid the risks of gastrostomy tube placement. In this report, a national database was quantitated in an effort to

FIGURE 1
![Graph showing national trends in feeding interventions for cleft palate.]

FIGURE 2
![Graph showing national trends in feeding interventions for cleft palate.]

FIGURE 3
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FIGURE 4
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REFERENCES