

Prevalence of Pre-operative Infant Naso-Alveolar Molding for Cleft Lip/Palate & Billing Practices: Analysis of National Database

Anna D Lee BA BS¹; Molly Murphy BS¹; Catherine Alder BS; Jasmine Chaij BA BS¹, Antonio Porras PhD¹, Phuong D Nguyen MD¹; Jason Yu DMD MD¹; Brooke French MD; Kristen Lowe DDS¹; David Mathes MD; David Khechoyan MD¹

¹Children's Hospital Colorado, Department of Pediatric Plastic Surgery

Introduction:

Naso-alveolar molding (NAM) is a pre-operative adjunctive neonatal therapy for cleft lip and palate offered by 39% of all United States (US) cleft treatment teams. The goals of NAM are to minimize the width of the cleft and improve nasal aesthetics before primary cleft lip repair in order to improve surgical outcomes. NAM may be completed by Pediatric Dentists or Pediatric Orthodontists. Despite pre-operative infant orthopedics having been employed since the 1950s, few studies exist that document the true national prevalence of NAM. This study aims to determine the national prevalence of pre-operative NAM and examines the heterogeneity of NAM billing practices.

Methods:

This retrospective study used TriNetX, a national deidentified aggregate database encompassing over 110 million patients across 78 different healthcare organizations. The study period spanned from 1/1/2000 to 11/3/2023. Patients were identified through Current Procedural Terminology (CPT) and Current Dental Terminology (D) codes. Inclusion criteria included patients under 12 months of age who underwent unilateral (CPT-40700) or bilateral (CPT-40701, CPT-40702) cleft lip repair. Using dental and procedural billing codes identified for NAM (CPT-21079, CPT-21080, D-5931, D-5932, D-5936), patients were categorized by the year of their initial cleft lip repair. Patient demographic data were extracted and analyzed through TriNetX, which divided the US into eastern and western regions. Logarithmic interpolation analysis was performed using PRISM software.

Results:

Of the 5,514 patients who met inclusion criteria and had undergone primary unilateral or bilateral cleft lip repair, 128 patients (2.3%) were billed with known procedural or dental codes for NAM. Among all patients, 63.0% (n=3,555) were male and 61.7% (n=3,481) were white. Geographically, 35.7% (n=2,015) patients were from the South of the US.

The incidence of NAM was zero until 2013 and increased to 11 in 2017 and 13 in 2023. The prevalence of NAM was zero in the first 13 years and increased from 0.1% (n=1) in 2014 to 2.3% (n=128) by 2023 ($p < 0.05$).

Conclusion:

This study found only 2.3% of all identified cleft lip/palate patients have been billed with pre-operative NAM based on established medical or dental billing codes, which is significantly lower than expected, if 39% of US cleft teams offer this treatment. This suggests possible inconsistencies in billing practices existing among NAM providers or incomplete capture of patients who paid out-of-pocket. Understanding NAM billing practices is crucial for improving reimbursement rates and increasing patient access to this service.