



INTRODUCTION

- Cleft palate affects ~1 in 1,500 live births. Primary palatoplasty establishes the initial repair of the palate.
- Secondary palatoplasty addresses velopharyngeal dysfunction or oronasal fistulae which directly impacts speech production, quality of life, and long-term functional outcomes that persist or develop after primary surgery.
- Prior studies are limited to single-institution studies, leaving a critical gap in establishing a national benchmark and population-level quality assessment.
- The rate of secondary surgery could serve as a measurable, population-level indicator of primary palatoplasty durability and surgical quality.

SIGNIFICANCE: National trend data can be used to identify system-level quality improvement opportunities and enable institutional benchmarking against national standards.

OBJECTIVE: To define national temporal pattern and short-term outcomes following secondary palatoplasty and benchmark these findings against primary palatoplasty in U.S. cleft palate care.

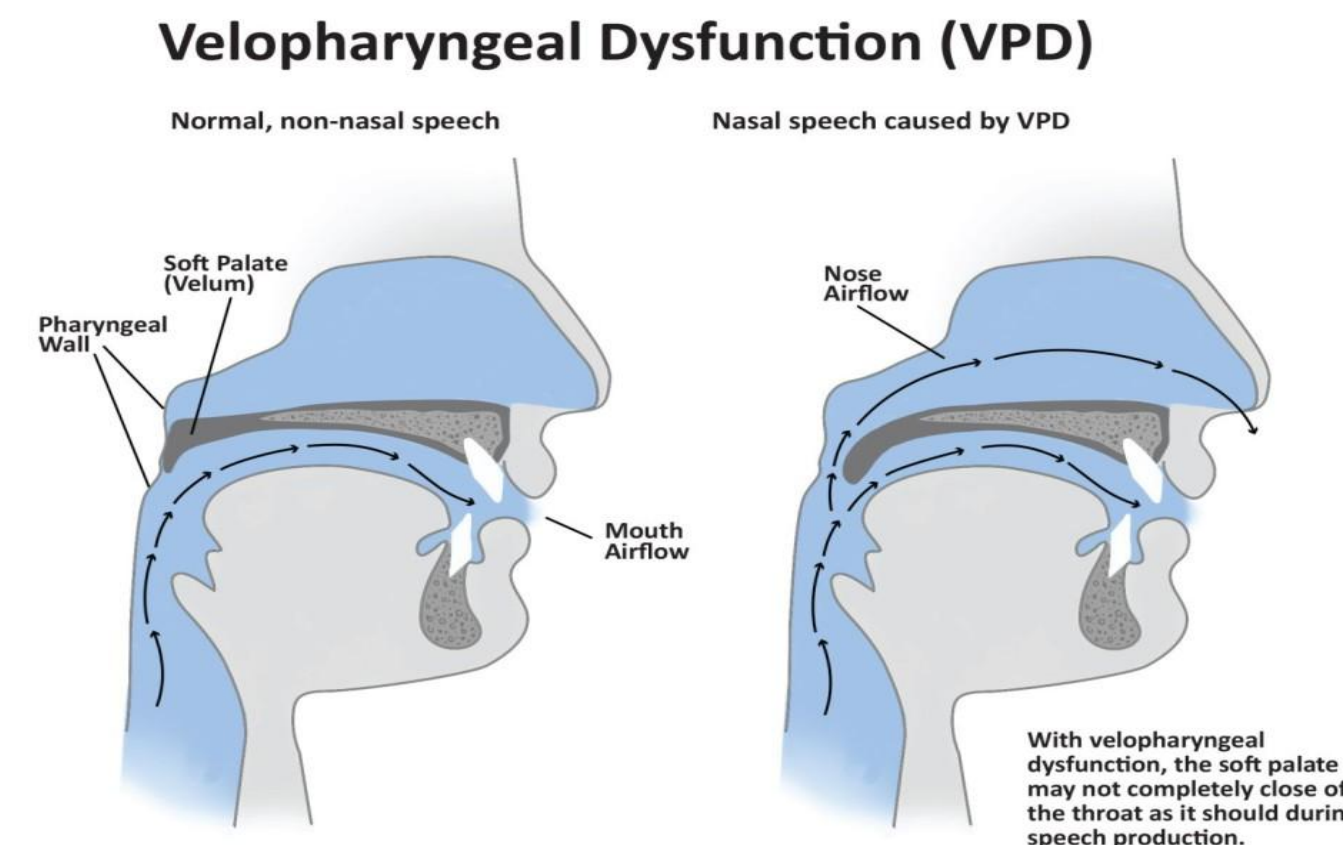


Figure 1. Speech-related nasal air escape resulting from velopharyngeal dysfunction

METHODS

Study Design

Retrospective cohort study

Data Source

American College of Surgeons (ACS) NSQIP-Pediatric Database, 2012 to 2023

Study Cohorts

Two distinct cohorts were defined using Current Procedural Terminology (CPT) codes:

Primary Palatoplasty (n = 17,841): Age <24 months with CPT codes 42200, 42205, 42210

Secondary Palatoplasty (n = 8,368): Age ≥18 months with CPT codes 42215, 42220, 42225-42227

Outcomes

Primary: Temporal trends in secondary palatoplasty volume
Secondary: 30-day complications, readmission, reoperation, prolonged length of stay (LOS >2 days)

Analysis

Cohort extractions and analysis were performed using R program, trends in proportion were assessed using Cochran-Armitage Test ($P < 0.05$)

RESULTS

KEY FINDINGS:

- Secondary palatoplasty volumes declined** relative to primary repairs over time (aOR 0.96/year, $p < 0.001$), despite substantial expansion of participating hospitals.
- 30-day outcomes were low and comparable** (primary vs. secondary): complications 0.2% vs. 0.1%, readmission 2.3% vs. 1.5%, prolonged LOS (>2 days) 11.5% vs. 10.2%, and reoperation 0.9% vs. 1.2%.

Temporal Trends: Primary & Secondary Volumes with Secondary:Primary Ratio
NSQIP-Pediatric 2012–2023

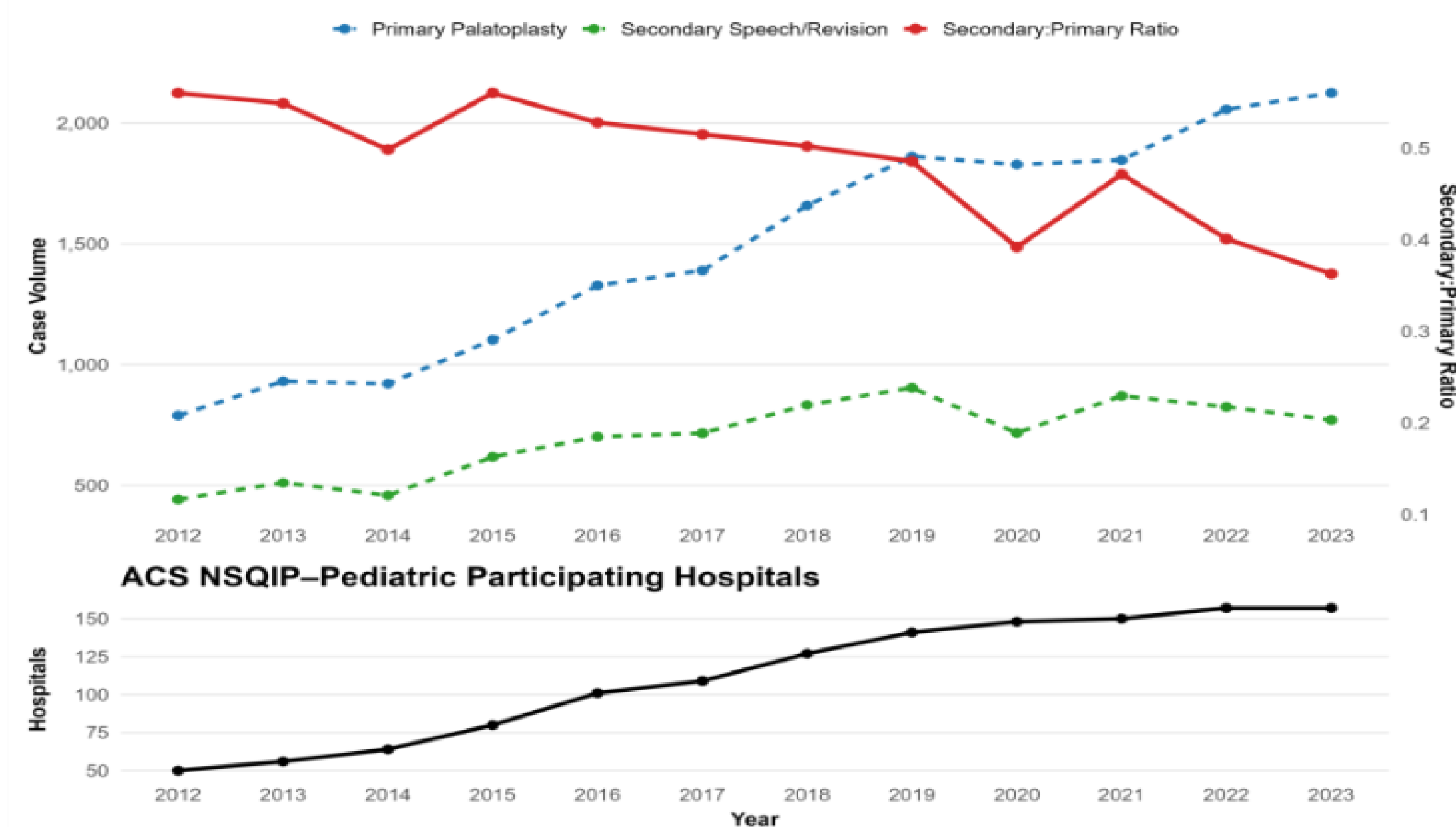


Table 1. 30-Day Outcomes of Primary and Secondary Palatoplasty

Outcomes	Primary	Secondary
Any Complications (%)	36 (0.2)	8 (0.1)
SSI/ Wound Complications (%)	0 (0.0)	0 (0.0)
Bleeding/ Transfusion (%)	0 (0.0)	0 (0.0)
Readmission (%)	410 (2.3)	129 (1.5)
Reoperation (%)	157 (0.9)	100 (1.2)
LOS >2 days (%)	2,051 (11.5)	853 (10.2)

Table 2. Baseline Characteristics of Primary and Secondary Palatoplasty Cohorts

Characteristics	Primary	Secondary
N	17,841	8,368
Age, days (median [IQR])	366.0 (312.0, 423.0)	2,589 (1780.8, 3813.2)
Female, n (%)	8,309 (46.6)	3929 (47)
ASA ≥ 3, n (%)	3068 (17.2)	1357 (16.2)
OR Time, min (median [IQR])	132.0 (96.0, 178.0)	90.0 (60.0, 133.0)

CONCLUSIONS

The declining secondary-to-primary ratio over time, despite rising primary case volume, suggests improvements in primary repair quality, durability, and coordinated cleft care (aOR 0.96/year, $p < 0.001$).

- These findings provide a national reference** against which institution can assess their own secondary palatoplasty rates, a key quality metric in cleft care.
- Secondary palatoplasty is safe** and remains an essential component of U.S. cleft care, with 30-day outcomes comparable to primary repair.
- NSQIP-Pediatric** is a valuable tool for population-level, longitudinal quality monitoring in pediatric cleft surgery.

DISCUSSIONS & LIMITATIONS

- Despite rising primary repair volumes, secondary palatoplasty remains a consistent component of cleft care.
- The observed decline in secondary procedures likely reflects improvements in surgical techniques and perioperative care.
- The comparable short-term outcomes support the continued role of secondary palatoplasty when clinically indicated.
- Although using data from 2012 to 2023 enables trend analysis, evolving practice patterns may limit contemporary applicability.
- Future analyses with more recent data and functional outcomes may strengthen transparency, interpretation, and clinical application.

REFERENCES

- ACS = American College of Surgeons
- aOR = Annual Odds Ratio
- ASA = American Society of Anesthesiologists
- CPT = Current Procedural Terminology
- IQR = Interquartile Range
- LOS = Length of Stay
- NSQIP = National Surgical Quality Improvement Program

