

Early Surgery Not Associated With Reduced Rate of Sleep Apnea or Speech Disorders in Patients With Tongue-Tie

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Key Findings:

- The rate of lingual frenotomies, the surgical release of tissue under the tongue, or tongue-tie, performed for newborns increased from 98 per 10,000 babies in Q1 of 2015 to a peak of 212 per 10,000 babies in Q2 2021 and then trended slightly down to 158 per 10,000 babies by Q4 2024.
- Among children diagnosed with tongue-tie at birth, those who received a lingual frenotomy within six weeks had similar rates of obstructive sleep apnea and speech disorders by age 5 compared to children who did not have a lingual frenotomy, but a slightly higher rate of central sleep apnea (422 per 10,000 babies vs. 307 per 10,000 babies).

Lingual frenotomy, a surgery to release connected tissue beneath the tongue, is frequently performed in newborns diagnosed with tongue-tie or feeding difficulties. Although proponents suggest that early lingual frenotomy may mitigate future risks of speech disorders or sleep-disordered breathing, recommendations around the procedure remain limited.^{1,2} We aimed to understand trends in frenotomy procedures and whether frenotomy performed within six weeks of birth influences the risk of sleep apnea or speech disorders by age 5.

In the first quarter of 2015, lingual frenotomy occurred in 98 per 10,000 babies. The rate rose to a peak of 212 per 10,000 babies in the second quarter of 2021, as seen in Figure 1. The rate then trended down slightly, to 158 per 10,000 babies in the last quarter of 2024.

Lingual Frenotomy Rate by Quarter

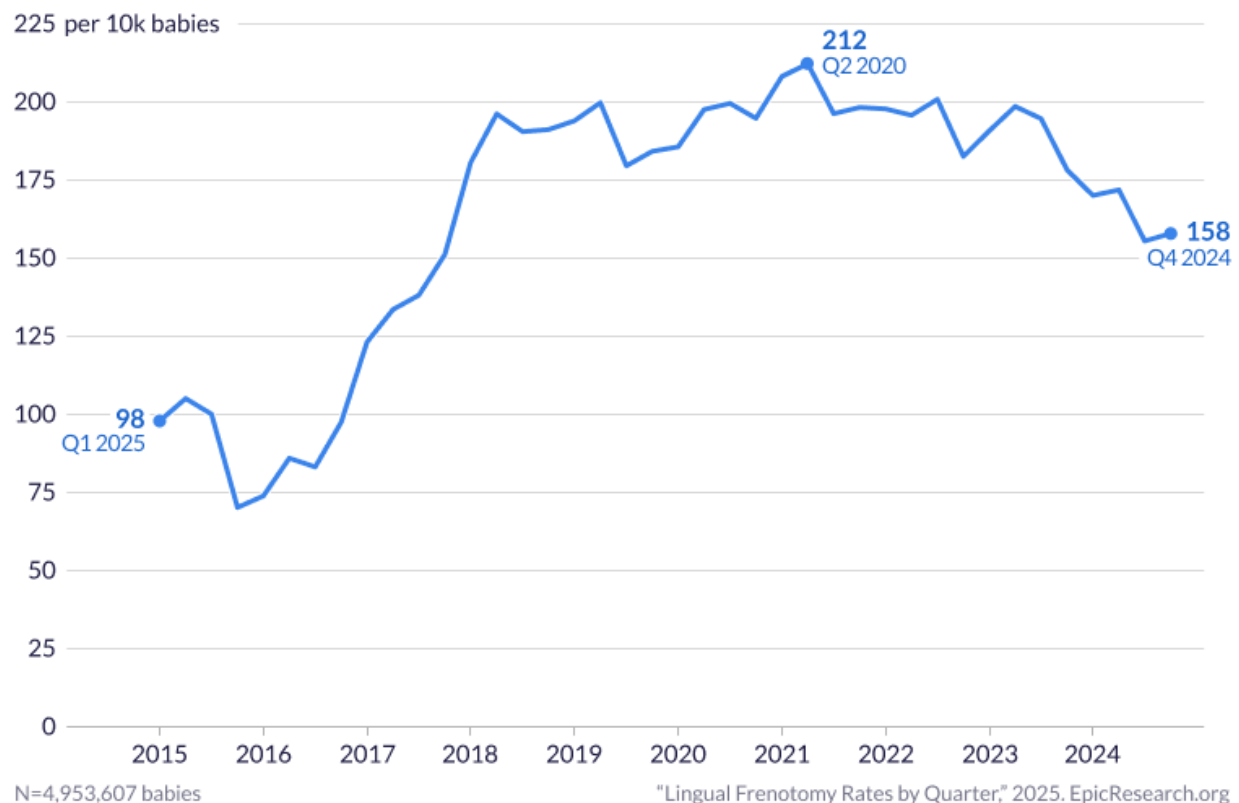
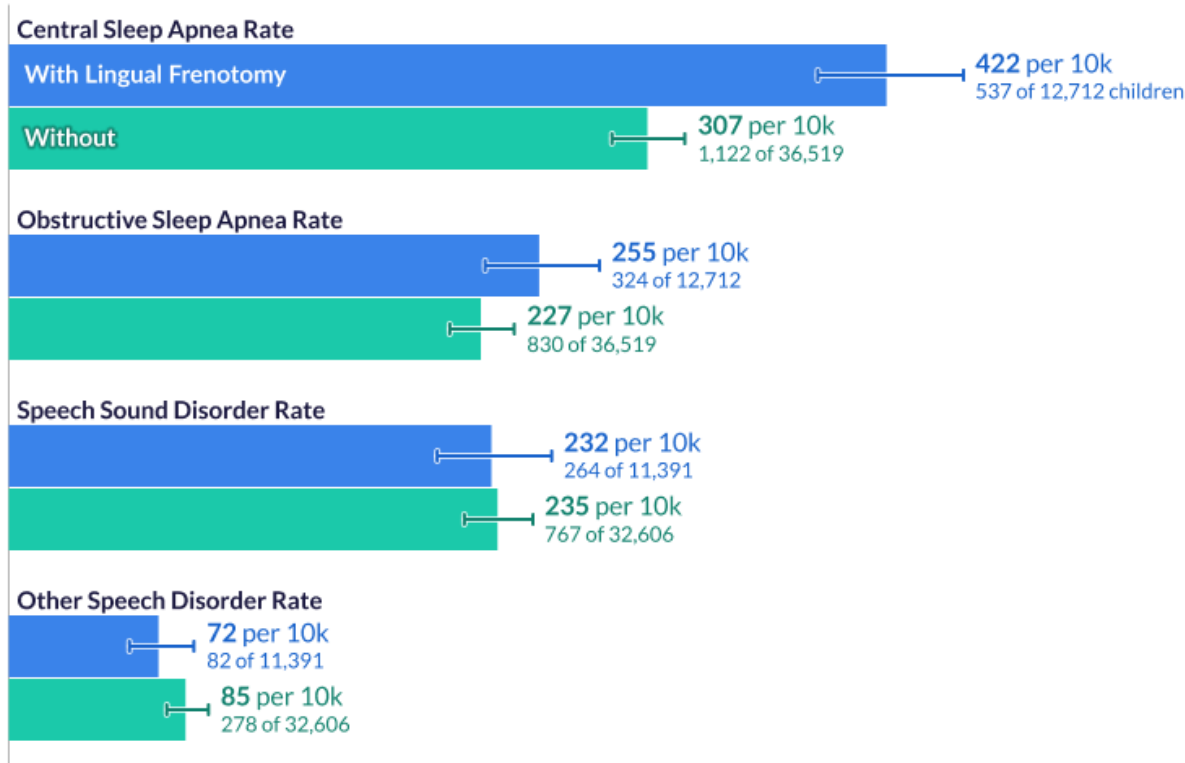


Figure 1. The quarterly rate of newborns who have a lingual frenotomy within six weeks of birth.

Next, we looked at the association between lingual frenotomies and the outcomes of sleep disorders and speech disorders among children who were diagnosed with tongue-tie. We compared patients who did not have surgery to those that did have surgery and included patient sex, social vulnerability, rural-urban classification, and prematurity status in our analysis.

We found that rates of obstructive sleep apnea and speech disorders were not significantly different between the populations, as seen in Figure 2. Children who had a prior frenotomy had slightly higher rates of central sleep apnea (422 per 10,000 babies vs. 307 per 10,000 babies) by their fifth birthday. Limiting the analysis to patients with a diagnosed feeding difficulty showed similar results.

Sleep Apnea and Speech Disorder Rates with and Without Frenotomy



"Sleep Apnea and Speech Disorder Rates with and Without Frenotomy," 2025. EpicResearch.org

Figure 2. The rates of sleep apnea and speech disorders among children diagnosed with tongue-tie at birth by whether they had a lingual frenotomy within six weeks of birth.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 300 million patient records from 1,700 hospitals and more than 40,000 clinics from all 50 U.S. states, Lebanon, and Saudi Arabia. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. Carnino JM, Rodriguez Lara F, Chan WP, Kennedy DG, Levi JR. Speech Outcomes of Frenectomy for Tongue-Tie Release: A Systematic Review and Meta-Analysis. *Ann Otol Rhinol Laryngol*. 2024;133(6):566-574. doi:10.1177/00034894241236234
2. Messner AH, Walsh J, Rosenfeld RM, et al. Clinical Consensus Statement: Ankyloglossia in Children. *Otolaryngol Head Neck Surg*. 2020;162(5):597-611. doi:10.1177/0194599820915457

Data Definitions

Term	Definition
Study period	Children born between Q1 2015 and Q1 2020
Study population	Inclusion: • Children with an outpatient face-to-face visit both - o Within the first six weeks after birth - o At or after fifth birthday

	- Children with a birth record in Cosmos Exclusion: - Children with a lingual frenotomy after six weeks but before the fifth birthday - Children who had a labial frenotomy - Children with one of these diagnoses anywhere in their chart: - Cerebral palsy: ICD-10-CM G80* - Down syndrome: ICD-10-CM Q90* - Prader-Willi syndrome: ICD-10-CM Q87.11 - Birth injury to the skull or face: ICD-10-CM P13.0*, P13.1*, or P15.4* - Pierre Robin Sequence: ICD-10-CM Q87.0 - Beckwith-Wiedemann Syndrome: ICD-10-CM Q87.3 - Sickle cell: ICD-10-CM D37.0*, D37.1*, D37.2*, D37.4*, D37.5*, D37.6*, D37.7*, D37.8*, or D37.9*
Outpatient face-to-face visit	An encounter with a type of Emergency, Office Visit, Well Child, Follow-up, Telemedicine, Urgent Care, Walk-In, Routine Prenatal, Postpartum Visit, or Fetal Care Consult
Exposures	Lingual frenotomy: - A procedure mapped to CPT code 41010 or 40819 - A procedure whose name includes "frenotomy," "frenectomy," "frenulectomy," "frenulotomy," or "PR incision of tongue fold" and does not include "lip," "labial," "penis," or "penile"
Outcomes	Sleep apnea or speech disorders diagnosed by the fifth birthday
Labial frenotomy	A procedure mapped to CPT code 40806 or whose name includes "frenotomy," "frenectomy," "frenulectomy," or "frenulotomy" and "lip" or "labial"
Sleep apnea	Obstructive sleep apnea: ICD-10-CM code G47.33 Central sleep apnea: ICD-10-CM code G47.30, G47.31, G47.34, G47.35, G47.36, or G47.37
Speech disorders	Speech sound disorder: ICD-10-CM code F80.0 Exclude children with any of the following diagnoses anywhere in their chart from consideration in this outcome: - F80.4 or F7[0-9] (hearing and intellectual disability) - F80.1 – Expressive language disorder - F80.2 – Mixed receptive-expressive language disorder - R47.0 – Dysphasia (difficulty speaking) - R47.81 – Slurred speech
Matching	Legal sex RUCA: Metropolitan, Micropolitan, Small Town, Rural Social Vulnerability Index quintile Prematurity: Gestational age < 37 weeks Diagnosis frenotomy is indicated for: - Ankyloglossia (tongue-tie): ICD-10-CM code Q38.1 - Feeding difficulties (of the newborn): ICD-10-CM code P92.2, P92.5, or P92.9 - Other feeding problems: ICD-10-CM code P92.3 or P92.8
Model specifications	Risk ratio Patients with a labial frenotomy were excluded from both populations.

Table 1: Lingual Frenotomy Rate by Quarter

	2015				2016				2017			
Lingual Frenotomies/10k Babies	97.9	105.1	100.1	70.2	73.9	86.0	83.2	97.5	123.2	133.6	138.2	151.2

	2018				2019				2020			
Lingual Frenotomies/10k Babies	180.7	196.2	190.5	191.2	194.0	199.8	179.6	184.2	185.7	197.6	199.6	194.8

	2021				2022							
Lingual Frenotomies/10k Babies	208.2	212.3	196.3	198.3	197.8	195.8	200.9	182.6				

	2023				2024							
Lingual Frenotomies/10k Babies	190.8	198.6	194.7	178.3	170.1	171.9	155.5	157.9				

Table 2: Sleep Apnea and Speech Disorder Rates with and Without Frenotomy

	Rate Of Outcome	95% CI Low	95% CI High
Central Sleep Apnea			
With Frenotomy	4.22%	3.89%	4.59%
Without Frenotomy	3.07%	2.90%	3.25%
Obstructive Sleep Apnea			
With Frenotomy	2.55%	2.29%	2.84%
Without Frenotomy	2.27%	2.12%	2.43%
Speech Sound Disorder			
With Frenotomy	2.32%	2.06%	2.61%
Without Frenotomy	2.35%	2.19%	2.52%
Other Speech			
With Frenotomy	0.72%	0.58%	0.89%
Without Frenotomy	0.85%	0.76%	0.96%