

What are the Current Trends in and Timing of Bilateral Cochlear Implantation among Children, Adults, and Older Adults in the United States?



HEALTH
UNIVERSITY OF UTAH

¹Mana Espahbodi, MD; ²Patti Trautwein, MA, AuD; ²Terry Zwolan, PhD, CCC-A;

¹Neil S. Patel, MD; ¹Richard K. Gurgel, MD, MSCI

¹Department of Otolaryngology, University of Utah, Salt Lake City, UT

²Cochlear®, Lone Tree, CO

Introduction

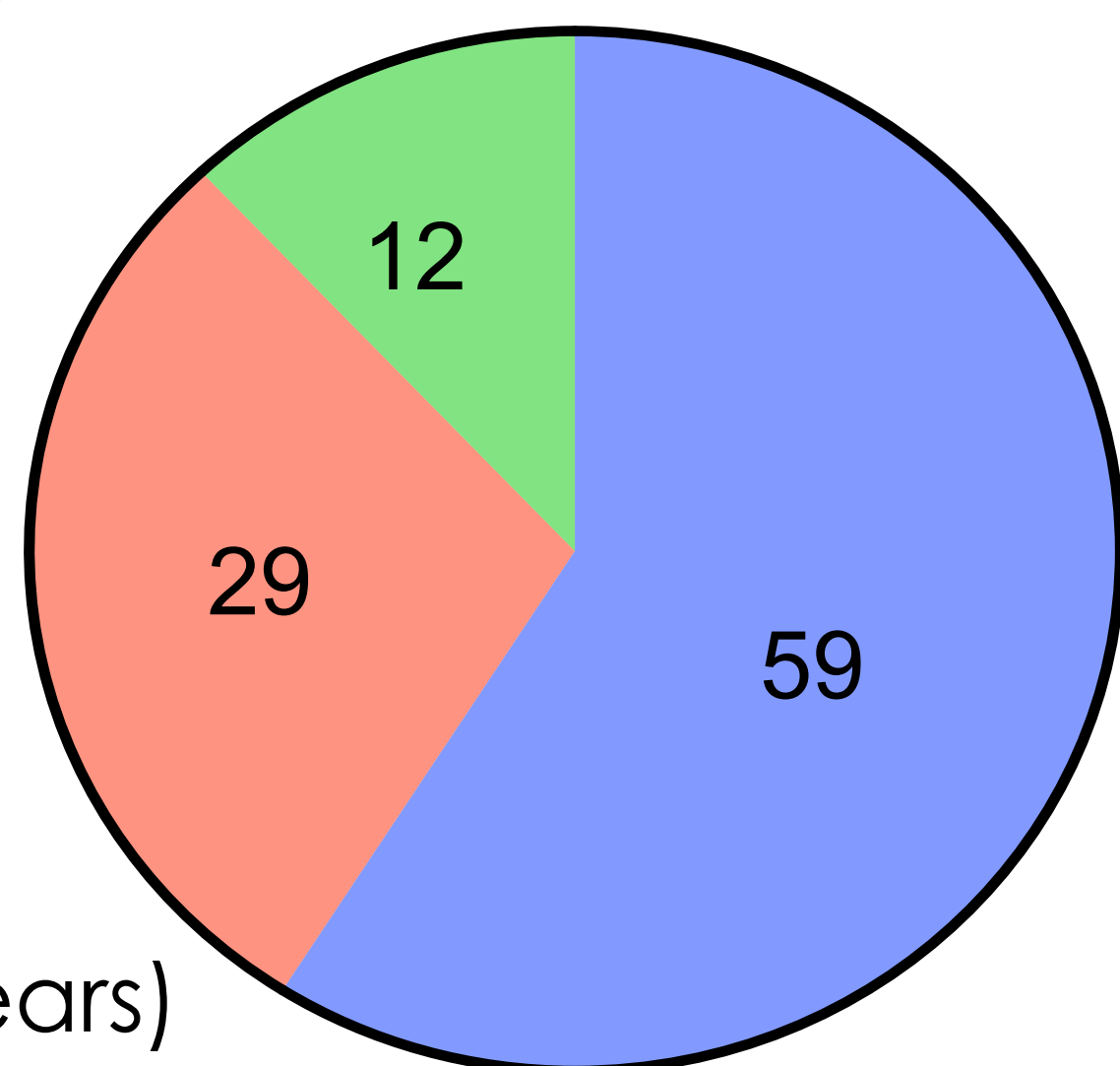
- Bilateral cochlear implantation (CI) = standard of care for bilateral severe-profound sensorineural hearing loss
- Bilateral CI can occur simultaneously (on the same date) or sequentially (on different dates)
- Trends in bilateral CI have not been well described
- **Study objective** → To determine the trends in bilateral simultaneous compared to bilateral sequential CI in children, adults, and older adults in the United States

Methods

- Bilateral CI device registration in the United States from a single manufacturer was reviewed from 2005 – 2023
 - Manufacturer has an estimated 60% of the global market share¹
- Descriptive and comparative (paired-samples T test) statistical analysis performed

Results

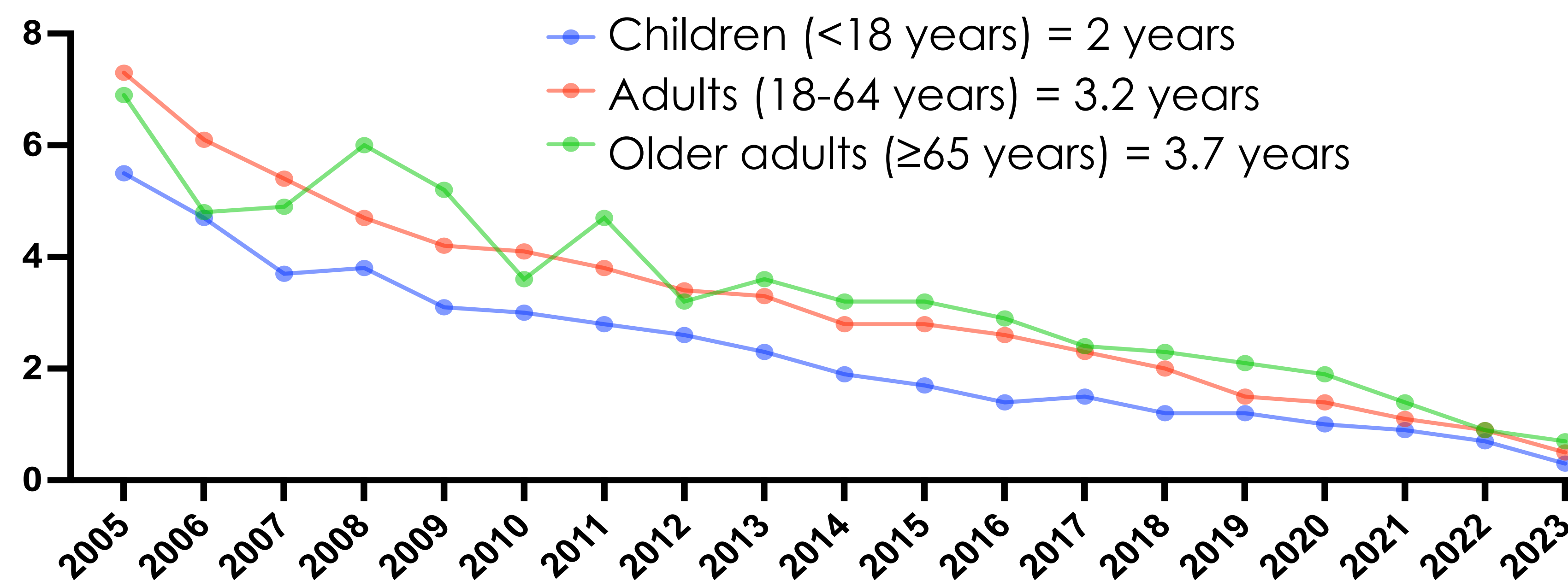
Percentage Undergoing Bilateral CI by Age Group



- 25,650 patients undergoing bilateral CI

- Children (<18 years)
- Adults (18-64 years)
- Older adults (≥65 years)

Average Delay (years) for Bilateral Sequential CI



Significant decrease over time: when comparing 2005-2009 to 2020-2023, mean difference (95%CI) = 4.1 (2.6-5.6) years, **p = 0.007**

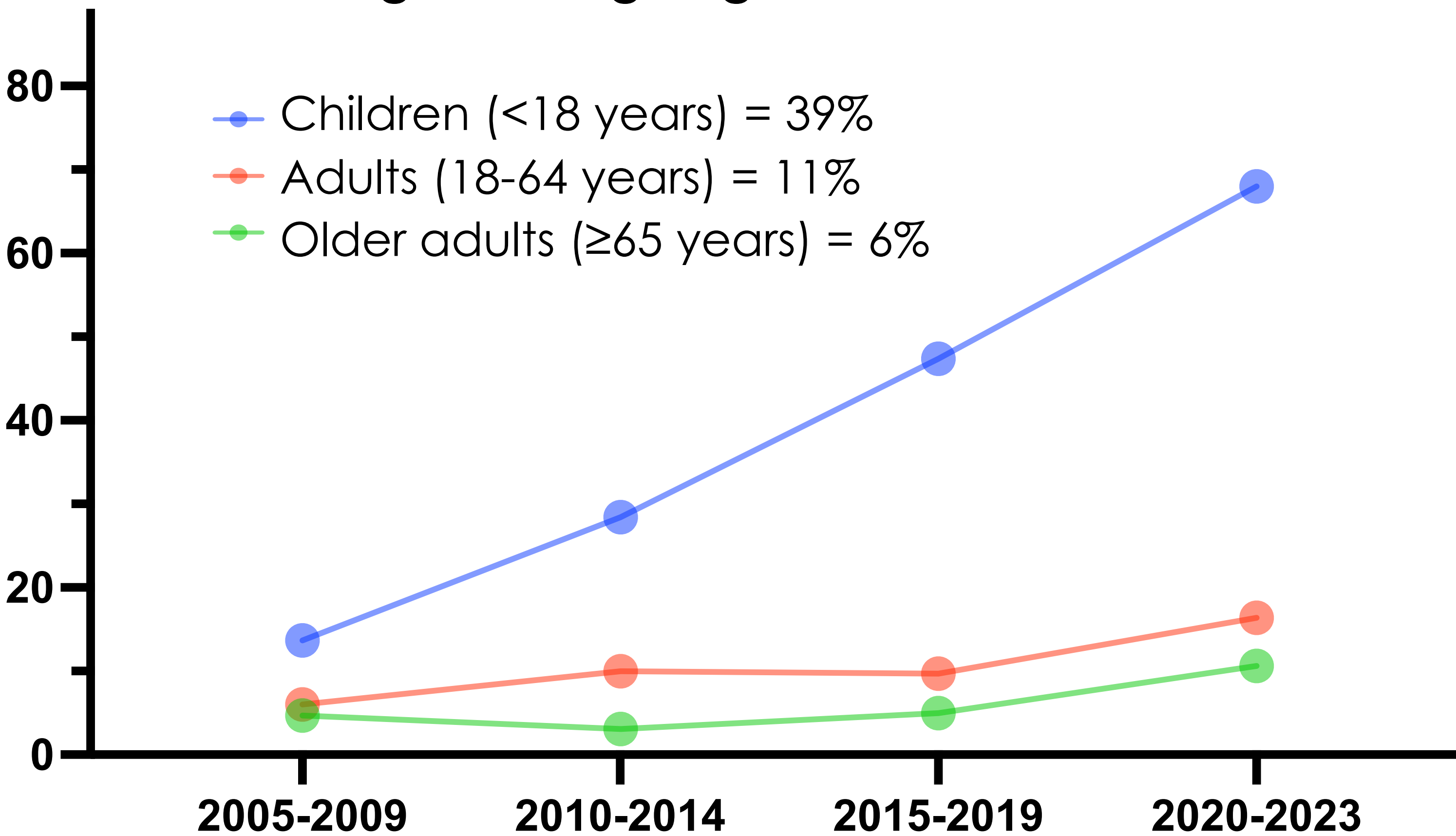
Non-significant increase over time: when comparing 2005-2009 to 2020-2023, mean difference (95%CI) = 23.5 (-42.9-90.0) %, p=0.267

Non-significant increase over time in children: when comparing 2005-2014 to 2015-2023, mean difference (95%CI) = 36.7 (-0.8-74.1)%, p=0.051

Children are more likely than older adults to undergo bilateral simultaneous CI: mean difference (95%CI) = 33.5 (0.2-66.9)%, **p=0.049**

- No significant difference between children and adults: mean difference (95%CI) = 28.9 (-2.3-60.0)%, p=0.060

Percentage Undergoing Bilateral Simultaneous CI



Discussion

- Bilateral CI improves auditory performance and quality of life,^{3,4} outcomes are similar in simultaneous and sequential⁴
- Bilateral, simultaneous CI results in cost savings^{5,6} - increased utilization should be considered

Conclusions

- Over time, there has been an expected, but not significant increase in bilateral simultaneous CI
- Children are more likely to undergo bilateral simultaneous CI than older adults
- There is an average delay of 2-4 years in those undergoing bilateral sequential CI; this time delay has significantly decreased from 2005-2022

References

1. Cochlear Limited. Annual Report 2023. Accessed March 3, 2024. <https://assets.cochlear.com/api/public/content/db4f441469aa4263accdfc23980d21b?v=ce8bbd15>
2. Zeng FG. Celebrating the one millionth cochlear implant. JASA Express Lett. Jul 2022;2(7):077201. doi:10.1121/10.0012825
3. Puechmaile M, Lambert C, Aubry K, et al. The French National Cochlear Implant Registry (EPIIC): Bilateral cochlear implantation. Eur Ann Otorhinolaryngol Head Neck Dis. 2020;137 Suppl 1:S51-S56. doi:10.1016/j.anorl.2020.07.005
4. Schauwecker N, Patro A, Holder J, Moberly AC, Perkins E. Simultaneous versus Sequential Cochlear Implantation in Adults: Quantitative and Qualitative Outcomes. Otolaryngol Head Neck Surg. Published online June 6, 2024. doi:10.1002/ohn.848
5. Merdad M, Wolter NE, Cushing SL, Gordon KA, Papsin BC. Surgical efficiency in bilateral cochlear implantation: a cost analysis. Cochlear Implants Int. 2014;15(1):43-47. doi:10.1179/1754762813Y.0000000042
6. Trinidade A, Page JC, Kennett SW, Cox MD, Dornhoffer JL. Simultaneous versus sequential bilateral cochlear implants in adults: Cost analysis in a US setting. Laryngoscope. 2017;127(11):2615-2618. doi:10.1002/lary.26673



HEALTH
UNIVERSITY OF UTAH

