

Understanding Barriers to Timely Cochlear Implantation in the Pediatric Population

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BACKGROUND

- Social determinants of health (SDH) may affect timely cochlear implementation (CI).
- Early detection of sensorineural hearing loss (SNHL) in children has dramatically increased since the advent of the universal newborn hearing screen.
- CI before 2 years old demonstrates favorable language and hearing outcomes.
- Early implementation is critical to leveraging brain plasticity for auditory development.

METHODS

- Study Design: Observational retrospective cohort study at tertiary children’s hospital
- Patient population: Ages 0-18 years undergoing cochlear implant (n = 97)
- Timeline: January 2015 to December 2020.
- Primary outcome: interval time from audiological qualification for CI to implantation
- Secondary outcomes: demographic information, distance from hospital, public vs. private insurance, language of primary caretaker

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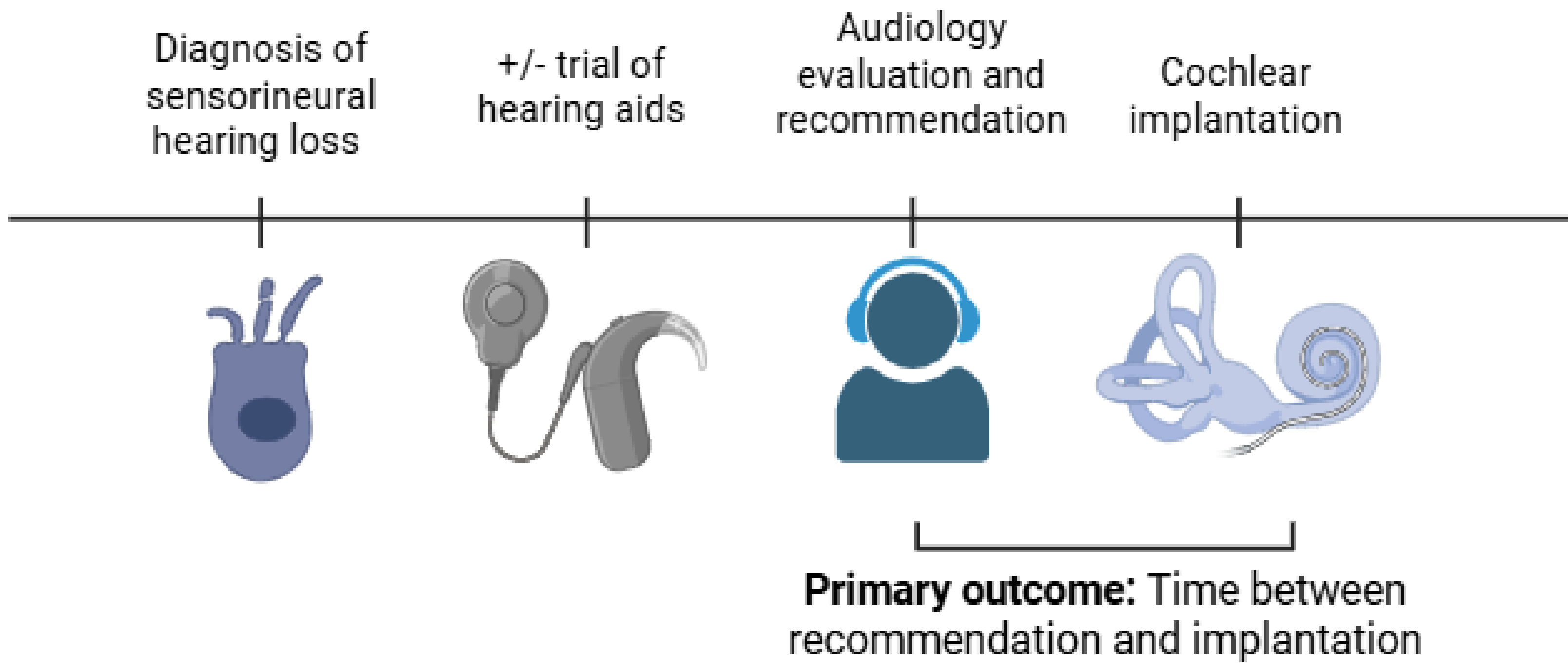


Figure 1. Process of SNHL Diagnosis to CI

Table 1. Demographics

Age		2.78 yrs (IQR 1.28-5.73)
Sex	Male	52 (55.3%)
	Female	42 (44.7%)
Race/Ethnicity	White	66 (70.2%)
	Black	12 (12.8%)
	Latinx	10 (10.6%)
	Asian	6 (6.4%)
Type of Insurance	Private	38 (40.4%)
	Public	56 (59.6%)
Language	English	83 (88.3%)
	ASL	7 (7.4%)
	Spanish	3 (3.2%)
	Burmese	1 (1.1%)
Distance to Hospital		60.4 mi (IQR 15.2-136)

RESULTS

Chi Square Analysis: Percentage of Patients with Cochlear Implantation Before the Age of Two

Race	White patients	44	$\chi^2 = 1.95$ (p = 0.16)
	Non-white patients	40	
Language	English	39	$\chi^2 = 0.19$ (p = 0.66)
	Non-English	45	
Distance to Hospital	<60 miles	34	$\chi^2 = 0.79$ (p = 0.37)
	>60 miles	44	
Insurance	Public	41	$\chi^2 = 0.17$ (p = 0.68)
	Private	37	

Student's T-test: Average Time (in months) from Audiologic Qualification to Cochlear Implantation

Language	English	4.45	P < 0.05
	Non-English	2.74	
	ASL	3.41	P = 0.32
	Non-ASL	4.28	
Distance to hospital	<60 miles	3.33	P = 0.12
	>60 miles	5.04	
Insurance	Public	4.89	P = 0.07
	Private	3.11	
Race	White	4.01	P = 0.62
	Non-White	4.57	

CONCLUSIONS

- Children with non-English speaking parents experienced statistically significant less time between CI recommendation and CI.
- Patients with parents who used American Sign Language (ASL) experienced less time between recommendation and CI compared to non-ASL-speaking parents.
- Race, insurance status, and distance to hospital showed a trend towards significance, suggesting they may affect the timing between CI candidacy and implantation
- Future studies capturing a larger sample size may further elucidate these results.

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