Diagnostic Delays in Children with Co-Occurring Autism Spectrum Disorder (ASD) and Hearing Loss (HL): Exploring Contributing Factors Affecting Age of Diagnosis and Intervention

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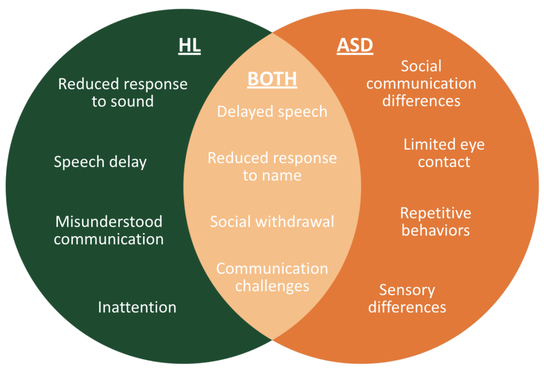
INTRODUCTION

- **Autism Spectrum Disorder (ASD) and HL** are both conditions characterized by differences in communication, social engagement, and learning (American Psychiatric Association, 2024; Centers for Disease Control and Prevention, 2025).
- **Prevalence is substantial** as 1 in 31 children in the United States have been diagnosed with ASD and approximately 1.7 per 1,000 children are born with HL each year (Shaw et al., 2025; Centers for Disease Control and Prevention, 2025).
- **Co-occurrence of HL and ASD is common.** Research has shown HL and abnormal auditory function occur more frequently in children with ASD than in the general population, with suspected rates ranging from 3.5 to 55% (Rosenhall et al., 1999; Demopoulous & Lewine, 2016). Additionally, ASD rates are elevated in children with HL (6-7%) compared to non-autistic youths (3.2%) (Kancherla et al., 2013; Shaw et al., 2025).
- **Diagnostic overshadowing** may occur due to overlapping features between ASD and HL that may delay recognition of one condition in the presence of another (Beers et al., 2014).
- **Potential for misdiagnosis and delayed intervention is considerable in this population**, as with children with HL receive an ASD diagnosis an average of three years later than their hearing peers (Ludwig et al., 2022; Szarkowski et al., 2014).



AIMS

Prior research has established diagnostic overshadowing as a barrier to accurate and timely diagnosis of ASD in children with HL; however, there are limited studies identifying specific variables contributing to this diagnostic timing. This retrospective cohort investigation sought to:

- Identify common patterns, referral sequences, and occurrence of diagnostic milestones for children with a dual diagnosis of ASD and HL
- Compare the age and timing of the ASD diagnosis in a subsample of children served within the Children's Hearing Program (CHP), a specialized multidisciplinary program with access to ASD evaluations, versus those receiving services from community providers

METHODS

A retrospective chart review from November 2015 to November 2025 was undertaken evaluating patients with a dual diagnosis of ASD and HL seen at University of Miami Ear Institute via EPIC chart review. **A total of 1013 patient charts were reviewed and 164 were included based on the following criteria.**

INCLUSION:

- **Age:** Patients aged 0-21 years at the time of hearing loss and ASD diagnoses
- **Dual Diagnosis:** Documented permanent hearing loss (unilateral, bilateral, conductive, mixed, or sensorineural) and diagnosis of ASD
- **Care Setting:** Completed one or more visits at UMEI and has an available chart from a clinic visit within the past 10 years

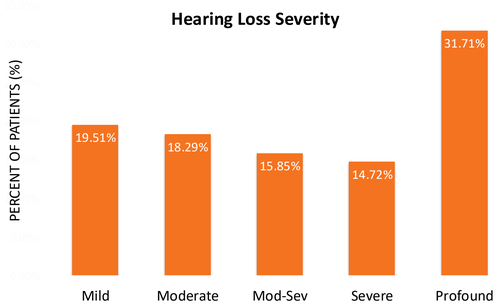
EXCLUSION:

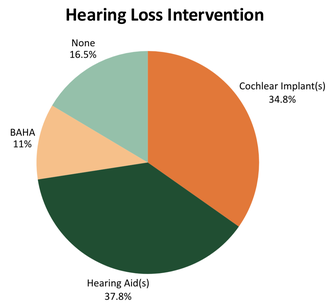
- **Transient CHL:** Non-permanent hearing loss which resolved with or without medical intervention
- **Central Auditory Processing Disorder (CAPD)**
- **Diagnosis Outside of Age Range:** Either ASD or HL diagnosis occurred after the age of 21

DEMOGRAPHIC DATA

Characteristic	Number (N)	Percent (%)
Gender		
Male	114	69.51%
Female	50	30.49%
Race		
White	134	81.71%
Black or African American	19	11.59%
Asian	4	2.44%
More Than One Race	3	1.83%
Unknown or No Reported	4	2.44%
Ethnicity		
Hispanic or Latino	110	67.07%
Non-Hispanic or Latino	47	28.66%
Unknown or Not Reported	7	4.27%

AUDIOLOGIC CHARACTERISTICS

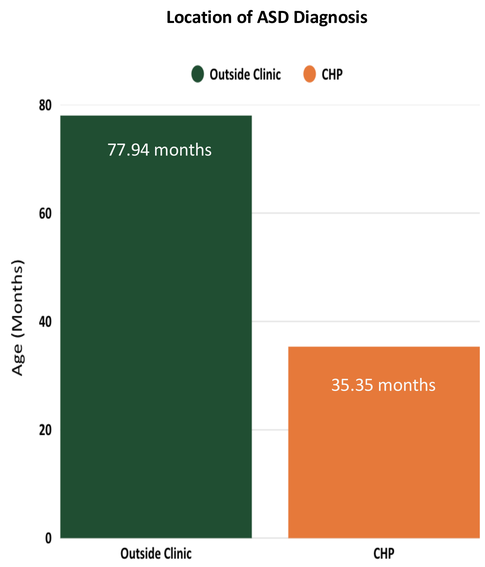




Hearing Loss Etiology	Number (N)	Percent (%)
Genetic	43	26.21%
Risk Factors	13	7.92%
Infectious Diseases	5	3.04%
ANSD	3	1.82%
Neurologic	6	3.65%
Structural/Anatomic	20	12.19%
Acquired or Congenital Cholesteatoma	3	1.82%
Multi-Factorial	3	1.82%
Unknown	68	41.46%

Hearing loss severity ranged from mild to profound, with profound loss most represented. Children received hearing aids, cochlear implants, BAHA devices, or no intervention. **Among families who did not pursue intervention, 70% (19/27) had mild or unilateral hearing loss,** suggesting that for those families they perceived the hearing loss as "minimal" and likely chose to prioritize the ASD symptoms and intervention.

AVERAGE AGE OF ASD DIAGNOSIS



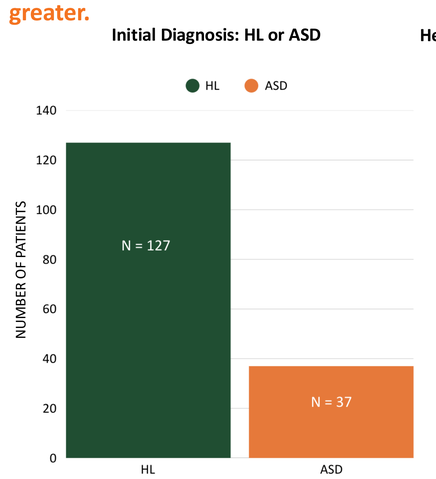
Children with hearing loss diagnosed with ASD at **outside clinics had an average age of diagnosis of 77.94 months compared to 35.35 months at CHP, representing a 42.6 month (3.55 year) earlier diagnosis** and highlighting the critical role of coordinated interdisciplinary teams in reducing diagnostic delay.

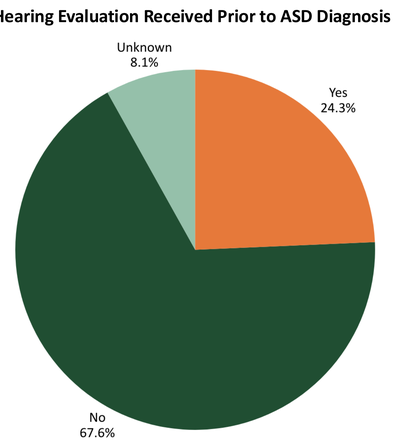
On average, **the time from a child receiving hearing intervention to ASD diagnosis at CHP was 13.23 months**, highlighting the importance of interdisciplinary programs with access to psychologists specialized in HL that can conduct these evaluations

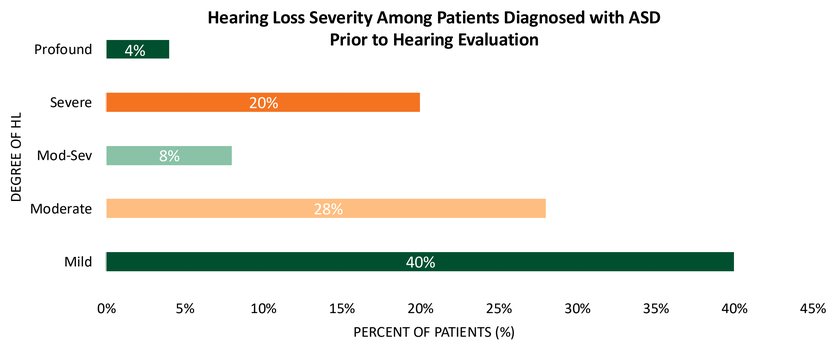
DIAGNOSTIC PATHWAYS

Most (77.4%, N=127) patients included in this study received a diagnosis of HL prior to ASD. However, 23% (N=37) were given a diagnosis of ASD before HL was identified. A small percentage of these children had received inaccurate outside audiologic evaluations (N=5) or received a diagnosis of mild (N=5) or late-onset/progressive hearing loss (N=4).

Notably, the majority (67.6%, N=25) of this group never received or were recommended a hearing evaluation prior to their ASD diagnosis. Within this population, 32% (N=8) have a diagnosis of moderately-severe hearing loss or greater.







ESTABLISHING ACCURATE DIAGNOSTIC PROFILES

Of concern, **the CHP Psychology team identified 9 children who had been misdiagnosed with ASD (39%) from outside clinics.** These children had not received audiologic evaluations or intervention prior to their ASD diagnosis.

"After [CI] surgery, patient has started to vocalize and speak few words, gesture with leads and points, and follow simple commands. She is sociable and interactive, does not isolate herself, makes good eye contact, plays with toys, engages in imaginative play, tolerates changes and transitions, and has no sensory issues. Patient is presently with no autistic features," (Neurologist X)

DISCUSSION AND CLINICAL IMPLICATIONS

1. Audiologists play a key role in identifying those at-risk for neurodevelopmental disorders.
2. Specialized multidisciplinary teams improve referral pathways, diagnostic accuracy, and reduce delays in identifying developmental and behavioral disorders in children with hearing loss. Coordinated interdisciplinary evaluations through CHP were associated with nearly a 4-year earlier ASD diagnosis in children with HL than community evaluations, improving access to time-sensitive services.
3. CHP had approximately a 13.23-month delay between hearing intervention and ASD diagnosis compared to the 3-year gap reported in the literature. This highlights the importance of streamlined referral pathways in reducing diagnostic delay.
4. All children suspected of ASD should complete a comprehensive hearing evaluation prior to their ASD evaluation to reduce any misdiagnoses.

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