AMERICAN ACADEMY OF AUDIOLOGY

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Invisible Hearing Loss

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A relatively new term in audiology is *invisible hearing loss*. Of course, it's not new or surprising to hearing care professionals (HCPs) that hearing loss is "invisible." That is, the person with hearing loss looks exactly like the person without hearing loss (unlike a person with a broken arm or leg, or a person in need of a wheel chair, or a person wearing glasses….).

Invisible hearing loss (IHL) refers to people who present with essentially normal hearing acuity (as demonstrated by their pure tone thresholds) and who present with listening disorders (including auditory neuropathy spectrum disorder, spatial hearing disorders, auditory and other processing disorders, attention disorders….). In many respects, IHL acknowledges that hearing and listening occur in the brain (not the ear) and there are a multitude of hearing and listening disorders in which the peripheral auditory nervous system presents as normal.

In my opinion, the audiogram is an excellent tool to understand someone's ability to hear (limited) pure tones and to reflect a small portion of hearing ability. However, the audiogram is a poor measure and an insufficient "gold standard" to reflect or estimate listening ability (i.e., making sense of sound, see Beck, 2014). Indeed, people who present with normal (or nearly normal) audiograms are often dismissed with not much more than a brief discussion about "the good news is your hearing is normal…" and "preferential seating" and "better lighting" and other *apparently* reasonable strategies which in isolation, fail to address or incorporate a 21st century understanding of how humans hear and listen.

However, for many children and adults with normal hearing, invisible hearing loss may be (and often is) present in tandem with normal audiograms. That is, if we were to test deeper and challenge the entire auditory system (two ears and the brain working together as a true binaural system) in realistic acoustic environments, we might (more often) detect auditory neuropathy spectrum disorder (ANSD), and/or auditory processing disorders (APDs) and/or spatial hearing disorders (SHDs)–all of which (most often) co-exist with normal hearing (Beck,

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2014).

With specific regard to the importance of accurate spatial hearing, Cameron and Dillon (2014) reported that there are multiple reasons why children may not be able to listen well in noise despite normal hearing and importantly for some of these children, spatial hearing disorders are the only cause.

"Indeed, listening maximally requires cognitive ability including attention, working memory, listening effort, and, of course, the maximal delivery of acoustic information to the brain, including the maintenance of natural acoustic cues such as interaural loudness differences (ILDs) and interaural timing differences (ITDs) to facilitate binaural summation and binaural squelch" (Beck 2014a).

Therefore, when a patient (child or adult) presents with normal (or abnormal) pure-tone thresholds and their chief complaint is the inability to understand speech clearly in quiet or noise, a thorough diagnostic battery (including speech in noise tests and acoustic reflexes) is called for. The goal is not to simply document peripheral hearing loss (Beck, 2015) through an audiogram or worse, a pure-tone screening. The goal is to diagnose or describe the auditory-based communication disorder (i.e., a communication disorder manifested via audition). Unfortunately, a simple audiogram cannot document, estimate, reflect, or quantify speech-in-noise problems, neural or auditory processing difficulties, perceived distortions (loudness, spectral, or timing and more), attentional difficulties, etc.

Many people who complain about speech in noise have *invisible hearing loss* (i.e., it didn't show up on their audiogram) and these problems are likely to remain undocumented and problematic unless we do the work, dig deeper, and objectively stress the system by testing the ability of the ear and brain to work together in difficult listening situations (Beck, 2014a).

These issues are of significant importance for a number of reasons, not the least of which is "Listening is Where Hearing Meets Brain" (Beck and Flexer, 2011).

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For More Information, References, and Recommendations

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