



## Auditory Processing Disorders: Earlier Diagnosis Possible?

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### Editorial

Auditory Processing Disorders (APD) has been defined as the inability of the central nervous system to process incoming auditory information from the peripheral auditory system. It has been said that accurate representation of stimulus timing (latency) in the auditory brainstem is a hallmark of normal perception. Therefore, the diagnosis of APD is confirmed when functional listening difficulties are observed in the presence of both normal peripheral hearing and well-established deficits in one or several different auditory skill areas. In recent years, there has been an increased popular interest in these disorders; unfortunately, this interest has led to misconceptions and misinformation. There is now considerable confusion regarding what is and what are not an APD, how APD is diagnosed, and the methods for managing and treating the disorder.

Several protocols have been applied and investigated to help with the early diagnosis of APD. However, one of the many problems in early diagnosis of APD is the fact that in appearance the peripheral auditory system is intact and working normally. Evidence from previous research in this topic has demonstrated that children with APD can usually detect pure tones in a sound-treated room; in other word under ideal audiologic testing. Thus, they are frequently considered not to have hearing difficulties. Clinicians then, understandably, assume that electrophysiological recording will simply corroborate the finding of normal hearing. However, the ability to detect the presence of sounds in ideal listening conditions is only part of the processing that occurs in the auditory system.

In fact, most children with APD do not have a loss of hearing sensitivity, but rather have a hearing problem in the sense that they do not process auditory information normally. If the auditory deficits and difficulties are not identified early and the child does not receive adequate intervention, many children will have speech and language delays and the academic problems that result from these undiagnosed and untreated problems.

The basic audiologic assessment remains an important part of APD diagnosis; only audiologists can perform auditory processing testing and determine if a child presents, in fact, with the pathology. The traditional basic battery, including measurement of both air and bone conduction thresholds and tympanometry, is the cornerstone of differential diagnosis, especially useful for assessing the range of hearing most relevant to speech communication. Unfortunately, some of the developmental milestones required for testing are not met until age 7 or 8, due to brain maturation. However, because language skills should be developing much earlier, we need a tool that will help us to identify children with or at-risk of developing APD at an earlier developmental stage.

To date, existing protocols for the diagnosis and identification of children with APD do not include either High Frequency Auditory Brainstem Responses or High Frequency Otoacoustic Emissions Testing, in spite of the fact that these tests could detect subtle changes in the peripheral auditory system that would otherwise be overlooked. The basic audiologic assessment conventionally limited to frequencies of 8 kHz and below, unfortunately, does not permit the earliest detection of subtle auditory changes in the high frequency domain. Untreated hearing impairment compromises literacy development and scholastic achievement in the years ahead as well as presenting quality of life issues that pervade all populations. These patients, especially young children, may well be too immature to participate well in behavioral audiometry (conventional or high frequency). The key to appropriate treatment is, however, accurate and careful diagnosis by an audiologist. Therefore, objective population-appropriate testing methods become essential. To accomplish this, a clinically translatable protocol is needed to test the effectiveness and sensitivity of auditory electrophysiological recordings in the diagnosis of APD in children. The information obtained through electrophysiological recordings, and their correlation with behavioral testing-when possible, will be invaluable to early childhood audiologists and educators in helping identify and diagnose Auditory Processing Disorders.