

*(Approved by the Board of Directors of the Educational Audiology Association October 2015)*

## Auditory Processing Assessment

Listening difficulties in the classroom may result from deficits of attention, global cognitive function, language, auditory processing, hearing loss or a combination of these disorders. The complexity of an Auditory Processing Disorder (APD) justifies the need for a collaborative approach which incorporates a multi-disciplinary team in the evaluation process. Through this approach, students receive an appropriate evaluation insuring the development of an effective intervention plan.

### Definition

An APD refers to difficulties in the perceptual processing of auditory information in the central nervous system” (AAA, 2010). It is the result of the inefficient processing of what is heard that may be revealed in communication or academic difficulties (Katz, 2009). The American Speech-Language-Hearing Association (ASHA, 2005) provided the following definition which is cited by many professionals:

Auditory Processing (AP) refers to the efficiency and effectiveness by which the central nervous system (CNS) utilizes auditory information.... APD refers to difficulties in the perceptual processing of auditory information in the central nervous system and the neurobiologic activity that underlies that processing. An Auditory Processing Disorder may co-exist with other disorders (e.g., attention deficit hyperactivity disorder [ADHD], language impairment, and learning disability) (p.2).

The U.S. Ninth Circuit Court of Appeals in *E.M v. Pajaro Valley Unified School District* (August 2, 2012) ruled that an auditory processing disorder (APD) is an eligible diagnosis for special education services under the Individuals with Disabilities Education Act (IDEA). The ruling further stated that the diagnosis should be made through assessment completed by an audiologist. Eligibility could be classified under speech or language impairment, specific learning disability or other health impairment depending on the individual student situation.

### Characteristic Behaviors

Children at risk for APDs often display some of the following behavioral manifestations (Johnson & Seaton, 2012):

- Listening behaviors consistent with an individual who has a hearing loss; however, normal hearing has been confirmed,
- Difficulty understanding speech in the presence of noise or rooms with excessive reverberation times,
- Decreased attention to auditory information when compared to attention to visual information,
- Inconsistent or inappropriate responses to auditory information or requests made by others,
- Difficulty comprehending and following rapid speech,
- Breakdown in following directions or remembering auditory instructions

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## Auditory Processing Assessment

- Regularly asks for information or directions to be repeated or rephrased,
- Difficulty in detecting changes in prosody that impact the understanding of sarcasm or jokes,
- Poor phonological/phonemic awareness skills,
- Poor auditory discrimination skills for speech sounds,
- Difficulty localizing the source of an auditory signal,
- Weaknesses in speech-language or psychoeducational tests with an emphasis on auditory comprehension or auditory related skills,
- Difficulty learning a new language

### Collaborative Team Approach

The above characteristics may have a cause-effect association with an auditory processing disorder or the result of other co-morbid conditions (Katz, 2009). Therefore, it is important to involve additional professionals in the assessment process.

Although a multidisciplinary psychoeducational approach with a diversity of professionals is always preferred, an auditory processing evaluation should minimally include collaboration between the audiologist and the speech-language pathologist. Listening and language skills are interwoven and therefore may be difficult or impossible to sort out in behavioral assessment. When auditory input and processing is compromised, speech perception is impaired, inhibiting the development of vocabulary, syntax, semantics, and ultimately academic performance.

### Referrals

Referrals may be made by parents, teachers, other professionals, or by the students themselves using a variety of sources. The first step in assessment should include observation using one or more teacher/parent checklists. These surveys aid in the planning for testing and provide initial information regarding how auditory skills affect academic, social, and communication abilities. An example of the screening and assessment pathway is illustrated in Figure 1.

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## Auditory Processing Assessment

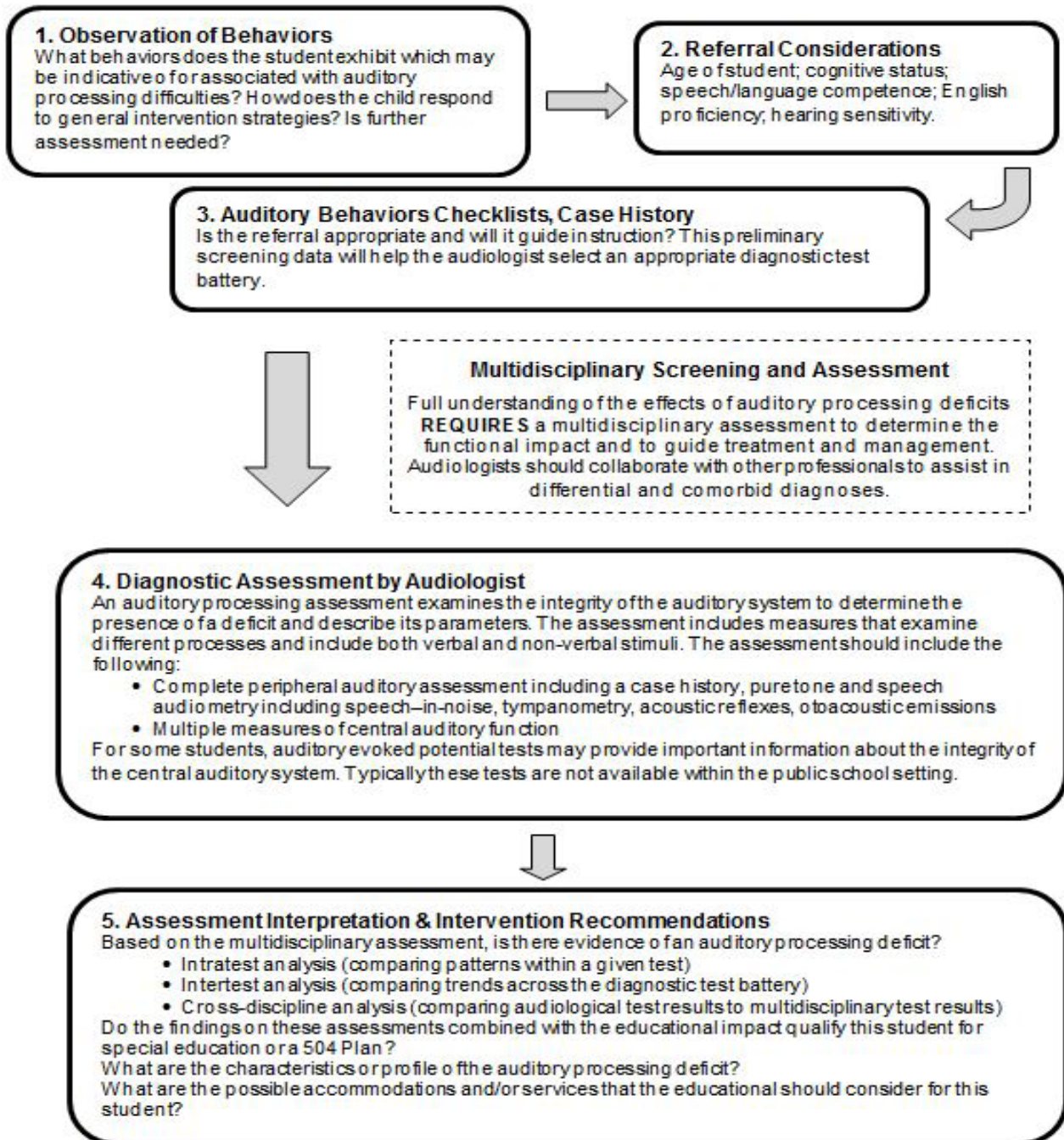


Figure 1. Flowchart of APD Screening and Assessment Procedures (adapted from the Colorado Department of Education (2008), (Central) Auditory Processing Deficits: A Team Approach to Screening, Assessment & Intervention Practices.

## Auditory Processing Assessment

### Assessment

APD can be identified through the use of tests that are directed toward performance of auditory skills and the processing of auditory stimuli.

Assessment guidelines require that children:

- have cognitive abilities to enable testing,
- have English as their primary language (or use assessments in the child's primary language if other than English)
- have peripheral hearing within the normal range, and
- have intelligible speech.

While several test norms require a child to be 7 years or older, a growing number of tests are aimed at identifying APD in younger ages where early intervention is likely to be more effective. Listening and communication checklists, and tests of language and cognition may be used to identify younger children “at risk” for auditory difficulties (Moore, Rosen, Bamiou, Campbell, & Sirimanna, 2013).

### Behavioral Tests

Behavioral tests of auditory processing provide evidence of auditory and cognitive skills which are associated with academic, social and/or communication abilities. This information, along with data on speech, language and academic abilities, enable professionals to better address deficits in specific skill areas.

Audiologists should undertake auditory processing testing with the understanding that no single assessment tool is likely sufficient for use as a basis for diagnostic decision making. Rather, a variety of assessment tools should be used to cross check and confirm the presence or absence of an APD.

### Auditory Biological Tests

Biological tests of hearing range from otoacoustic emissions, auditory evoked response testing (i.e., auditory brainstem response, middle latency response, cortical event-related potentials) to functional imaging. These tests may locate or clarify some auditory-sensory processing issues of the central auditory nervous system. However, even though biological tests may provide this information, a profile is still needed that includes functional abilities and auditory skill deficits an individual may experience due to an APD. Behavioral tests are needed because they reflect auditory-cognitive processes and can present a profile of functional auditory abilities.

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## Auditory Processing Assessment

### Intervention

Based on results of the auditory processing test battery, recommendations should include the following interventions:

- Environmental modifications - recommendations to improve access to auditory information in the classroom, which would include classroom acoustical modifications and remote microphone assistive technology
- Therapeutic interventions - based on the results of the evaluation, therapeutic recommendations may include direct intervention for auditory training
- Compensatory strategies - recommendations that will help the student minimize the impact of the APD.

An individualized education program (IEP) may be developed by the educational team if the student qualifies for services under IDEA. The IEP should provide a detailed description of environmental modifications, direct interventions and compensatory strategies that are to be implemented to improve academic progress. A 504 Plan may also be implemented for students with APDs who are not eligible for IDEA. These plans formalize accommodations and support services.

Educational intervention strategies should be aligned with academic content standards. Performance standards should identify auditory skills that are necessary for the development of knowledge and skills that enhance learning and academic success.

### References:

American Academy of Audiology, CAPD Task Force (2010). Clinical Practice Guidelines: Diagnosis, Treatment and Management of Children and Adults with Central Auditory Processing Disorder. Retrieved from <http://www.audiology.org/resources/documentlibrary/Documents/CAPD%20Guidelines%208-2010.pdf>

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Katz, J. (2009). *Therapy for APD: Simple, Effective Procedures*. Westminster Colorado: Educational Audiology Association.



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## Auditory Processing Assessment

Moore, D.R., Rosen, S., Bamiau, D-E, Campbell, N.G. & Sirimanna, T. (2013) Evolving concepts of developmental auditory processing disorder (APD): A British Society of Audiology APD Special Interest Group 'white paper', *International Journal of Audiology*, 52, 3-13.

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