

## **CENTRAL AUDITORY PROCESSING DISORDERS: AN OVERVIEW FOR PARENTS, TEACHERS, AND CLINICIANS**

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**Definition:** Simply stated, central auditory processing (CAP) involves what we do with what we hear. Competency in processing relies upon an intact auditory signal, an intact ear, an intact auditory nerve, and a brain that is able to receive the information (both verbal and nonverbal) and act upon it meaningfully. Central auditory processing disorder (CAPD) implies a range of behaviors from awareness of sound to higher-order analysis of linguistic information. Individuals with CAPD are a widely defined, heterogeneous group who may exhibit difficulties in primary or secondary form. Central auditory processing disorder suggests that a problem exist somewhere beyond the eighth cranial nerve (within the auditory nervous system). Individuals with CAPD generally have normal hearing. However, individuals with hearing loss may also experience CAPD.

**Etiology:** There are many causes (and correlates) which include changes in blood vessels or nerves that serve the brain, chronic otitis media, lead poisoning, and anoxia, among others. Some causes are unknown. Some CAP skills appear developmental in nature- that is, they mature over time with a variety of repeated and intact auditory experiences.

**Incidence:** It is believed that incidence is limited to 5% or less of the general population. However, due to the wide display of symptomatology and because CAPDs may present in secondary form (learning disabilities, attention deficit disorder, dyslexia, specific language impairment, etc.), this may be a low estimate. More boys than girls demonstrate symptoms.

**CAP Skill Areas:** There are numerous CAP skills. However, auditory memory, auditory discrimination, auditory figure-ground, auditory cohesion, and auditory attention appear to be the main areas that impact upon performance at home and in school.

**Language-Dependent Behaviors Affected by CAPD:** spelling, reading, writing, and speaking skills, as well as others, may be affected. The individual may also experience difficulty in comprehending verbal language of a higher order (such as lecture information in classrooms).

**Psychological Correlates:** Many individuals with CAPD suffer from poor self-esteem, often related to poor social relationships and difficulties with schoolwork. Effort and attention may be further affected by this problem. Therapy should address this issue by separating intelligence from disorder and by empowering the individual with knowledge, strategies, and responsibilities.

**Presenting Symptoms:** Behaviors may include (and are not limited to) the following:

- difficulties with following directions (immediate or deferred)
- difficulties with written dictation;
- difficulties with reading (encoding and /or decoding);
- difficulties with maintaining auditory attention;
- difficulties with spelling;
- difficulties with word math problems;
- appears to “mishear” frequently;
- atypical phonological skills;
- poor auditory discrimination skills;
- does not seem to infer the emotional status from a speaker’s tone of voice;
- is unorganized or forgetful;
- does not use appropriate logic in problem-solving;
- has extraordinary problems in learning phonics;
- performs better in one-to-one than in group situations;
- dislikes background noise;
- has a poor memory for words, numbers, sounds, etc.;

has difficulty comprehending higher-order linguistic information;  
is distractible.

It should be noted that these symptoms might be characteristics of other disorders as well.

**Diagnosis:** Diagnosis may be made from several perspectives including neurological, psychological, audiological, and speech-language. For school purposes, possibly the most functional perspectives are audiological, in combination with a specialized speech-language evaluation that examines the five skill areas (noted above), in relationship to language-dependent behaviors such as reading, writing, and spelling. The student's ability to follow directions (simple and complicated/immediate and deferred) in quiet and noise should also be assessed.

**Prognosis:** Significant gains may be achieved when diagnosis is timely and accurate. Intervention strategies must be varied and specific to the individual. Generally, prognosis is most favorable in young children.

**Clinical Strategies:** Some strategies include: reauditorization; subvocalization; auditory mirroring; auditory proofreading; modifying the listening environment; use of auditory trainers; rephrasing with expression (not repeating); and speechreading. Tolerance to background noise may be increased incrementally (fan-like noise to cafeteria-like noise' louder and louder noise; more difficult tasks...). It is important that the individual with CAPD become knowledgeable and responsible for implementing necessary strategies on an ongoing basis. Progress is most likely when the individual views his or herself as an important member of a "team" which includes family, teachers, and clinicians, among others.

For additional information:

Central Auditory Processing Disorder: Strategies for Use with Children and Adolescents, Dorothy A. Kelly, Communication Skill Builders, 1995, San Antonio, Texas ISBN 0761631623