

Information for Parents About Central Auditory Processing (CAP) Observations and Tests

Central Auditory Processing (CAP). Very concisely stated, central auditory processing may be explained as “what the brain does with what the ears hear” (Katz, 1994).

Central Auditory Processing Disorder (CAPD). A central auditory processing disorder (CAPD) is an information input problem. A student with a central auditory processing (CAP) problem generally has normal hearing sensitivity, but has difficulty with the reception and interpretation of auditory information. Although some symptoms of a CAPD are similar to a hearing loss and/or an attention deficit disorder (ADD), which is an output disorder, a CAPD is a distinctly different problem. The student with a CAP problem has trouble making sense out of what he/she hears. Although the sounds are loud enough, the student has difficulty understanding the message, therefore often acting like someone with a hearing or attentional problem. Refer to *Some Characteristics of Children with Central Auditory Processing (CAP) Problems* for more information about symptoms that teachers and parents often have observed in students with a CAP problem.

Comprehensive CAP Evaluation Battery. The test battery administered to assess various levels of central auditory processing (CAP) ability may include the observational profiles and test instruments listed below. The CAP evaluation is a dynamic assessment, in that tests are selected based upon the student’s age, observational data, case history information, and the student’s profile of CAP strengths and weaknesses in order to achieve a comprehensive evaluation. It is important to note the specific listening/testing condition when reviewing information for each test. *Monotic* refers to testing each ear independently. In a monotic listening condition there may be competing stimuli (e.g., noise, multi-talker conversation) in the opposing ear. A *dichotic* listening condition means a different stimulus (e.g., word, sentence, digit) is presented to each ear simultaneously and the listener is requested to repeat both stimulus items. Some tests involve slight distortion of the auditory stimulus. The majority of the CAP tests are presented using recorded stimuli.

Observation Instruments

- ❑ ***Screening Instrument for Targeting Educational Risk (S.I.F.T.E.R.).*** The student’s classroom teacher completes the S.I.F.T.E.R., a rating scale designed to “sift out” students who are educationally at risk, possibly as a result of hearing or other auditory problems. The S.I.F.T.E.R. compares the student to his or her classmates.
- ❑ ***Fisher’s Auditory Problems Checklist.*** The parent and the classroom teacher complete this 25-item checklist, indicating if the auditory-related behaviors are characteristic of the student.
- ❑ ***Children’s Auditory Performance Scale (CHAPS).*** The CHAPS is a scaled questionnaire used to quantify observed listening behaviors. The six listening conditions (noise, quiet, ideal, multiple inputs, auditory memory sequencing, auditory attention span) are rated on a 7-point scale. Each listening condition and the total score are scored as “pass” or “at risk”.

Screening Test

- ❑ ***Screening Test for Auditory Processing Disorders (SCAN).*** The SCAN tests both monotic and dichotic listening abilities. The Filtered Word (FW) subtest is a low redundancy speech test that measures auditory closure ability. A 20-word list of low-pass filtered (slightly distorted) monosyllabic words is presented to each ear independently. The Auditory Figure Ground (AFG) subtest is a monotic speech-in-noise test that consists of two 20-word lists presented with contralateral (opposite ear) competing multi-talker noise. The Competing Words (CW) subtest is a dichotic task, consisting of two lists of 25 paired monosyllabic words. The CW subtest is sensitive to neuromaturation and assesses binaural integration. One word is presented to each ear at approximately the same time and the listener is requested to repeat both words. The Competing Sentences (CS) is another dichotic test that measures binaural separation, the ability to listen to a different sentence presented to each ear and repeat the sentence delivered to the target ear.

Monaural Low Redundancy Speech Tests: Each ear is tested independently. The words or sentences are slightly distorted in order to assess auditory closure ability.

- ❑ ***Filtered Speech Test.*** This is a monotic test where the student listens to monosyllabic words that have been

slightly distorted by filtering high frequency information. This test of auditory closure ability requires the student to repeat the words heard. Each ear is tested separately.

- ❑ **Time Compressed Speech.** This test of auditory closure ability requires the student to listen to words that have been compressed (i.e., speeded up) and then repeat the words. Each ear is tested separately.
- ❑ **Time Compressed Speech with Reverberation.** This test of auditory closure ability requires the student to listen to words that have been compressed (i.e., speeded up) and also distorted slightly by adding reverberation that is similar to a typical classroom listening environment. Each ear is tested separately and the student is requested to repeat the words.

Tests of Temporal Processing: These tests assess the student's pattern perception and temporal functioning abilities, that is, the ability to process nonverbal auditory signals and to recognize order or patterns. Tests of temporal processing require the listener to discriminate sound based on a sequence of auditory stimuli or temporal order.

- ❑ **Pitch Pattern Sequence Test (PPST).** This is a tone test of frequency discrimination (high/low) used to test temporal patterning ability. The PPST also evaluates the listener's frequency discrimination, temporal ordering, and linguistic labeling abilities. The test is administered binaurally (same stimulus to each ear simultaneously). The score is given in percent correct and an adjusted score gives credit for acoustic reversals (e.g., *high-high-low* for *low-low-high*).
- ❑ **Duration Pattern Test (DPT).** The DPT is a test of duration discrimination (short/long) used to test temporal patterning ability. The DPT requires the listener to use temporal processing ability to order tonal stimuli, discriminate duration, and attach a linguistic label. For children experiencing difficulty labeling the acoustic stimuli, credit is given for acoustic reversals (e.g., *short-short-long* Vs *long-long-short*).
- ❑ **Auditory Fusion Test-Revised (AFT-R).** The *AFT-R* is a monotic test of auditory fusion. The student reports if one or two tones are heard. The test is administered in a diotic mode (same stimulus to both ears), although it may be given to the right and left ears independently.

Dichotic Speech Tests: In the dichotic test, a different stimulus is presented to each ear simultaneously. Binaural integration tests require the student to repeat everything that is heard in both ears. Binaural separation requires the student to ignore what is heard in one ear and repeat what is heard in the target ear.

- ❑ **Dichotic Digits Test (DDT).** The *Dichotic Digits* test measures the listener's ability to process information in a dichotic listening condition (binaural integration). This test requires the student to repeat four digits, two of which are presented to each ear simultaneously. Stimuli are digits 1-10, except 7.
- ❑ **Staggered Spondaic Word (SSW) Test.** The *SSW* is a test of binaural integration that assesses dichotic listening skills. The student is asked to attend to two spondee (bi-syllabic) words such as *upstairs* and *downtown*, which are presented simultaneously in various overlapping conditions to the two ears. Scores are given for each of four listening conditions: 1) right non-competing (RNC), 2) right competing (RC), 3) left competing (LC), and 4) left non-competing (LNC). Stimulus presentation is alternated between the left ear leading and the right ear leading. The listener is required to simply repeat the words heard.

Example: right ear: up stairs
left ear: down town

- ❑ **Competing Sentences Test.** The *Competing Sentences Test* is another dichotic test. The stimulus sentence is presented at a lower intensity level to one ear and the competing sentence at a higher level (+15 dB) to the opposite (contralateral) ear. It is a test of binaural separation that requires the student to repeat the stimulus (softer) sentence and ignore the competition (louder sentence).
- ❑ **Dichotic Rhyme Test.** This is a dichotic test of binaural integration. The student listens to two rhyming words, one to each ear, and repeats the words.
- ❑ **Dichotic Sentence Identification (DSI).** The student listens to two sentences, one presented to each ear simultaneously, and then indicates which of six stimulus sentences he/she heard.

Binaural Interaction Tests: Complimentary information is presented to each ear and the student must integrate the information and repeat the word or indicate when a tone is present.

- ❑ **Spondee Binaural Fusion.** This test of binaural interaction requires the student to listen to spondee (bi-syllable) words (e.g., *sidewalk*, *doorbell*), where the words have been slightly distorted through filtering and one syllable is presented to each ear. The student is to repeat the spondee words.

- ❑ **Masking Level Difference (MLD).** This binaural interaction test requires the student to identify when the stimulus (a tone or a word) “comes out of” the background noise. Most often spondee words are used when testing children.

Other:

- ❑ **Phonemic Synthesis Test.** This test assesses phonemic decoding (sound blending) ability. There are 25 test items that vary from two to four sounds per word. The test is given binaurally (same stimulus to each ear). A Quantitative Score (number of items correct) and a Qualitative Score (accounts for response behaviors) are computed.
- ❑ **Speech in Noise.** These auditory figure-ground tests evaluate the student’s ability to separate the target word from the competing stimulus (e.g., multitalker babble) in the opposite ear. This may also be tested when the target words and the competing stimulus are both presented through the speakers.

Following the evaluation, you will be provided with descriptions of any additional tests that are administered. The results of this test battery will be plotted on a CAP Student Profile to show your child’s CAP strengths and weaknesses. A written report, along with appropriate recommendations, will be provided at a later date.

For further information, contact _____ at _____ .