


*When the Brain Doesn't Hear:
Central Auditory Processing Disorder,
the Auditory Equivalent of
Cortical/Cerebral Visual Impairment*

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What if there are children and young adults with CVI who don't seem to have typical responses to sounds and speech but for whom Central Auditory Processing Disorder cannot—and may never be—accurately diagnosed?



What can we do???

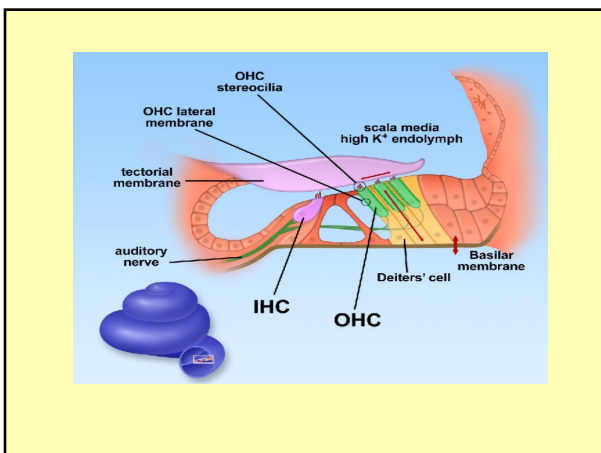
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**Central Auditory
Processing Disorder**

or

**Auditory Neuropathy
Spectrum Disorder?**

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Comparisons of Test Results

	ANSD	(C)APD
Tympanogram (tests the integrity of the middle ear)	Normal	Normal
Middle ear muscle reflexes	Abnormal or absent	Present
Otoacoustic emissions	Present or absent (over time)	Present
Auditory brainstem responses	Abnormal or absent	Normal
Pure-tone thresholds	Normal to severe/profound	Normal
Word recognition (quiet)	Excellent to poor	Excellent
Word recognition (noise)	Poor	Fair to poor

Comparison of Test Results for ANSD and APD

Morlet, T. in *Deaf-Blind Perspectives (2010)*. Volume 17 (2)

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Auditory Neuropathy Spectrum Disorder Risk Factors

- Anoxia
- Prematurity
- Hyperbilirubinemia
- Low birth weight
- Dietary thiamine deficiency
- Aminoglycosides (e.g., streptomycin, neomycin)
- Chemotherapies (e.g., Cisplatin)
- Hereditary factors

(National Institutes of Health)

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Risk Factors Common to CVI and Central Auditory Processing Disorder (CAPD)

- Hypoxia
- Anoxia
- Prematurity
- Seizure disorders
- Prenatal drug exposure
- Cytomegalovirus (CMV)
- Meningitis
- Low birth weight
- Traumatic brain injury
- Hydrocephalus
- Hypoxic ischemic encephalopathy
- Hyperbilirubinemia

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Some Signs of Central Auditory Processing Disorder

- Trouble paying attention to and remembering information presented orally, and may cope better with visually acquired information.
- Problems carrying out multi-step directions given orally; need to hear only one direction at a time.
- Poor listening skills.
- More time to process information.

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Signs of CAPD (cont.)

- Distractibility.
- Difficulty localizing sounds.
- Difficulty hearing in noisy environments with a lot of competing sounds.
- Difficulty understanding speech that is too fast.

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Signs of CAPD (cont.)

- Low academic performance.
- Behavior problems.
- Language difficulties (e.g., confusing syllable sequences, problems developing vocabulary and understanding language).
- Difficulty with reading, comprehension, spelling, and vocabulary.

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Test of Auditory Processing Skills, Third Edition (TAPS-3)

- Word discrimination
- Phonological segmentation
- Phonological blending
- Number memory (forward)
- Number memory (reverse)

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Test of Auditory Processing Skills, Third Edition (TAPS-3)

- Word memory
- Sentence memory
- Auditory comprehension
- Auditory reasoning

Martin, N.A., & Brownell, R. (2005). TAPS-3: Test of auditory processing skills, third edition. Torrance, CA: Western Psychological Services.

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Where Are We???

Teachers of students who are
blind or visually impaired
vs.
Teachers of students who are
Deaf or hard of hearing

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CAPD Interventions to consider

- Decrease auditory clutter.
- Allow sufficient time for auditory processing.
- Consider your rate of speech.
- Use a multi-sensory approach but consider the limits of simultaneous multi-sensory input.

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CAPD Interventions to consider

- Consider the significance of suprasegmental phonemes in comprehension.
- Support localization by drawing attention to sound sources.

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CAPD Interventions to consider

- **Decrease auditory clutter.**
- Allow sufficient time for auditory processing.
- Consider your rate of speech.
- Use a multi-sensory approach but consider the limits of simultaneous multi-sensory input.

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Roger Focus for auditory processing disorder
Because everyone deserves the chance to focus

Roger microphones
Whatever your child's learning environment, there is a Roger microphone to complete their system.

Roger® Pen
Worn around the speaker's neck, placed on a table or held in the hand, the multiple microphones of the Roger Pen automatically reduce background noise, focusing on the voices they need to hear.

Roger® Clip-On Mic
The Roger Clip-On Mic offers one-click correction and is perfect for parents of young children to use at the park, in the car, out shopping or anywhere where noise or distance may make focusing difficult.

Roger® Touchscreen Mic
Simple and intuitive microphone for the teacher to wear around the neck or place on a table to pick up speech from a group of students.

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CAPD Interventions to consider

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CNS LIMITATIONS OF PROCESSING THE ACOUSTIC/LANGUAGE ELEMENTS OF SPEECH

Age Approximations	Words per Minute
Preschool	approx. 124 WPM
Elementary (primary grades)	approx. 124-128 WPM
Elementary (upper grades)	approx. 128-130 WPM
Middle school	approx. 135-140 WPM
High School	approx. 145 WPM

(Hull, 2012)

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Elementary school teachers speak at 160-180 words per minute



Mothers speak at rates exceeding 170 words per minute

(Hull, 2012)

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If you look in the middle of your groups of desks, you will see a group number. Your numbers are on the board and on the book baskets. You will receive points on the board when I catch you being good. If your group is kind and quiet I might give you a point. If your group is the first to be ready when I give the signal I might give your group a point. At the end of the day we will count the points to see which group has the most points. The group with the most points gets a star on their chart from the star monitor. When you fill your chart you get to go shopping in our class store.

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CAPD Interventions to consider

- **Consider the significance of suprasegmental phonemes in comprehension.**
- Support localization by drawing attention to sound sources.

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Suprasegmental Phonemes



- Stress
 - Juncture
 - Pitch
 - Tone
 - Tempo

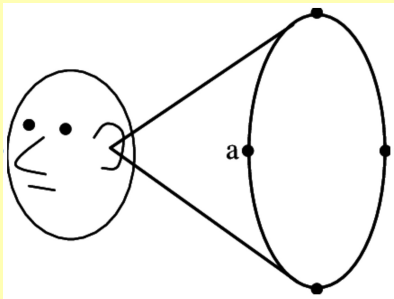
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The Cone of Confusion



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