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Objectives for Today

1. Define the terms Central Auditory Processing Disorder (CAPD) and Auditory Neuropathy Spectrum Disorder (ANSD) in lay terms.
2. Present a framework for considering a child’s risk factors, behaviors, and audiologic test results for ANSD and CAPD.
3. Describe some “do no harm” strategies to support speech/language acquisition and learning in children at risk for one of these conditions.
And, why are WE here? (1/2)

#1 – Lily

And, why are WE here? (2/2)

#2 – Jenny

1. LAY DEFINITIONS OF CAPD AND ANSD
Definition of Auditory Neuropathy/Dys-synchrony

“A type of sensorineural hearing loss that hinders clear transmission of sound signals to brain; the signals are often distorted.”

Where ANSD Occurs...
ANSD: Deeper Dive

ANSD: Some Factoids

■ "ANSD is much more complicated than we originally thought."
■ 
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Simulation of Auditory Neuropathy/Dyssynchrony

How would this type of hearing loss affect development of spoken language and learning
Definition of Central Auditory Processing Disorder (CAPD)

“A problem not with actually hearing sounds, but with processing in the brain the sounds we hear.”

Where CAPD Occurs...

CAPD: Some Factoids
- Affects approximately 2 – 3% of children.
Simulation of Central Auditory Processing Disorder (CAPD)

How might this type of disorder affect a child's development of spoken language, reading, and academic achievement?

2. A FRAMEWORK FOR DIFFERENTIATING CAPD AND ANSD:
   A. RISK FACTORS
   B. BEHAVIORS
   C. AUDIOLOGIC TESTS

2.a Risk Factors: ANSD and CAPD

<table>
<thead>
<tr>
<th>ANSD</th>
<th>CAPD</th>
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Syndromes Associated with ANSD

- Charcot-Marie-Tooth Disease
- Leber’s Hereditary Optic Neuropathy
- Friedreich’s Ataxia
- Refsum’s Disease
- Mitochondrial Disease

2.b.1 Behavioral Characteristics

ANSD (1 of 2)

- Infants often will pass newborn hearing screening, if only OAEs are used.
  
  
  
  

ANSD (2 of 2)

- Hearing may fluctuate.
  
  
  
  
  
  
  

In Washington’s 62 birthing hospitals, newborn hearing screening looks like this:

- 35 (56%) use AABR for initial screen
- 18 (29%) use OAE for initial hearing screen
- 9 (14.5%) use OAE and/or AABR*

*Some have NICUs. The OAE is for well-baby nursery; AABR is for NICU.

2.b.2 Behavioral Characteristics
CAPD (1 of 2)

- Difficulty understanding speech in presence of competing background noise*
- _*
- _*
2.c - Audiologic Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>ANEO</th>
<th>CAPD</th>
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<tr>
<td>Tympanogram</td>
<td>Normal (or not)</td>
<td>Normal (or not)</td>
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<tr>
<td>Middle ear muscle reflexes</td>
<td>Abnormal or absent</td>
<td>Present and normal</td>
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<tr>
<td>Otoacoustic emissions (OAE)</td>
<td>Present or absent (vary over time)</td>
<td>Present</td>
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<tr>
<td>Auditory brainstem responses (ABR)</td>
<td>Abnormal or absent</td>
<td>Normal</td>
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<tr>
<td>Pure-tone thresholds</td>
<td>Normal to severe/profound</td>
<td>Normal</td>
</tr>
<tr>
<td>Word recognition (quiet)</td>
<td>Excellent to poor</td>
<td>Excellent</td>
</tr>
<tr>
<td>Word recognition (noise)</td>
<td>Poor</td>
<td>Fair to poor</td>
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Test Battery for CAPD

- Includes at least one or two dichotic listening tests
- SCAN-C Test includes four tests of AP including filtered words, auditory figure ground, competing words, and competing sentences

A word about CVI (cortical visual impairment)

“Any child with a diagnosis of CVI and concomitant speech/language delays should be assumed to have cerebral hearing impairment (or) auditory processing disorder...”

~ Gordon Dutton
3. STRATEGIES TO SUPPORT SPEECH/LANGUAGE ACQUISITION AND LEARNING WHEN YOU SUSPECT CAPD OR ANSD

3.a Strategies to Support Children ANSD (1 of 2)
- There is great heterogeneity; individualized monitoring and observation required for each child
- _
- _
- _

3.a Strategies to Support Children ANSD (2 of 2)
- Hearing aids help about half of children with ANSD, at least in quiet settings
- _
- _
- _
3.b Strategies to Support Children CAPD (1 of 2)

- Manage the noise in child’s environment
- 
- 
- 

3.b Strategies to Support Children CAPD (2 of 2)

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References/Resources

See Attachment for more complete list with hyperlinks.

Central Auditory Processing Disorder

- https://cviscotland.org/mem_portal.php?article=66
References

Auditory Neuropathy Spectrum Disorder


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