Life-Changing Interventions for the New AD/HD: Beyond the DSM-5

Extra Information Slides F

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## Symptom Differences

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<th>AD/HD, CT</th>
<th>(C)APD</th>
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<td>1. Inattentive*</td>
<td>1. Problems hearing noise</td>
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<td>2. Distracted*</td>
<td>2. Problems following oral instructions</td>
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<td>3. Hyperactive</td>
<td>3. Poor listening skills</td>
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<td>4. Restless or Fidgety</td>
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<td>5. Impulsive</td>
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<td>6. Butts in/Interrupts</td>
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* **Distracted Inattentive symptoms much more prevalent in ADHD, CT**

“Item analysis revealed that only two of the most frequently cited behaviors were judged as characteristic of both disorders (i.e., inattention and distractibility). The majority of frequently cited behaviors were not seen as common to ADHD and CAPD.” (p. 78)

Comorbidity of (C)APD and AD/HD, CT

“These data are consistent with the hypothesis that APD and ADHD overlap partly while still being distinct entities. In addition to dimensional aspects, the parent’s rating may provide a guideline for establishing a diagnosis based on categorical dimensions.”

Comorbidity of (C)APD and Dyslexia

“Approximately half of the participants with developmental dyslexia showed clinically significant diminished performance on the FPT (Frequency-Pattern Test) and DPT (Duration- Pattern Test) indicative of APD. These results indicate that the percentage of persons with developmental dyslexia and comorbid APD may be substantial enough to warrant serious clinical considerations.” (p. 448)

Comorbidity of (C)APD and AD/HD, IT

Research has shown when pediatricians rated symptoms related to AD/HD, Inattentive Type (SCT) and audiologists rated symptoms rated symptoms related to (C)APD from the same list of 58 symptoms there was no overlap of symptoms.

Comorbidity of (C)APD and Asperger’s Disorder

“We now have research evidence to confirm significant problems for children and adults with Asperger’s syndrome in their ability to understand what someone says when there is background speech or noise...and perceive, discriminate and process auditory information.”
(p. 221)

People with Asperger’s Disorder are not good at filling in gaps in hearing.

Special Treatment Considerations with Asperger’s Disorder

- After you give a child with Asperger’s disorder a task ask, “Tell me what you have been asked to do?”
- Write down directions. The more multi-sensory they are the better.
- Directions must be based on the child’s language comprehension, not their ability to read and speak complex words.
- When giving oral instructions pause a few seconds between sentences to allow the child to process the information.

Diagnosing CAPD

• Team approach:
  – Audiologist (Case Manager)
  – Speech-Language Pathologist
  – Educator
  – Psychologist
  – Parents


**National Coalition for Auditory Processing Disorders:** [www.ncapd.org](http://www.ncapd.org)
Diagnosing CAPD

• Physicians – “If there is a disease or disorder related to hearing, you may be referred to an otolaryngologist, a physician who specializes in diseases and disorders of the head and neck.” (National Institute on Deafness and Other Communication Disorders, May 8, 2002, p. 3)

• American Medical Association: www.ama-assn.org
Treating CAPD

• Help with Grieving Process
• Environmental Modifications
  – FM Loop Systems, Amplification, Seating, Etc.
• Remediation (Direct Therapy)
  – Phonological Awareness, Temporal Patterning, Prosody Training, Interhemispheric Training
• Compensatory Strategies

“The accumulated auditory and cognitive science literature supports comprehensive programming incorporating both bottom-up (e.g., acoustic signal enhancement, auditory training) and top-down (i.e., cognitive, metacognitive, and language strategies) approaches delivered consistent with neuroscience principles.” (p. 13 of 26)

Treating (C)APD

Audiologists may use formal auditory training to take advantage of the brain’s plasticity using computer programs like:


Treating (C)APD

• Such training should take place in the workplace, home and school.
• The following training should be done simultaneously: environmental modifications, direct instruction, remediation and compensation strategies.

Treatment of (C)APD

“Environmental accommodations to enhance the listening environment may include but are not limited to preferential seating for the individual with (C)APD to improve access to the acoustic (and the visual) signal; use of visual aids; reduction of competing signals and reverberation time; use of assistive listening systems; and advising speakers to speak more slowly, pause more often and emphasize key words.” (p. 14 of 26)

Classroom Environmental Modifications

“These modifications may include decreasing reverberation by covering reflective surfaces (e.g., black/white boards not in use, linoleum or wood floors, untreated ceilings), using properly spaced acoustic dividers, using other absorption materials throughout open or empty spaces (e.g., unused coat areas), and/or changing the location of “study” sights. External noise sources can be eliminated or moved away from learning space e.g., aquariums, fluorescent lights that hum, and open door or wall.” (p. 14 of 26)

Classroom Accommodations

➢ “Accommodations that utilize technology to improve audibility and clarity of the acoustic signal itself (assistive listening devices such as FM or infrared technology) may be indicated for some individuals with (C)APD...The strongest indicators for the use of personal FM as a management strategy are deficits on monaural low redundancy speech and dichotic speech tests...” (p. 14 of 26)

➢ Such people have great difficulty in the acoustic environments encountered in schools, home and work.

Curriculum Adaptation

“Specific suggestions may include support for focused listening (e.g., use of note-takers, preview questions, organizers), redundancy (e.g., multisensory instruction, computer mediation), and the use of written output e.g., e-mail, mind-maps.” (p. 15 of 26)

How to Make your Classroom Acoustically Available

• CAPD students sit in first row.
• Provide good lighting in the room.
• Avoid assigning a teacher to student who DOES NOT speak with a common or local accent.
• Acoustical tile in the ceiling
• Carpeting with thick carpeting pad on the floor
• Beards and moustaches need to be well trimmed away from lips. This allows for better speech reading.
• No mini-blinds! Use draperies! Draperies absorb ambient sound better.
Classroom Acoustics

• The American Speech-Language Hearing Association (www.asha.org) has a position paper on this that includes a comprehensive bibliography: Paper number 37, supplement 14.

• The Counsel of Educational Facility Planners International (CEFPI) has the following article on their website about how to build in good classroom acoustics:

Sound Suppression Technology

Bose QuietComfort Sound suppression headphones:
www.bose.com
**FM Loop System**

Website: [www.harriscomm.com](http://www.harriscomm.com)

Helpful Websites for CAPD

• National Institute on Deafness and Other Communication Disorders: [www.nidcdinfo@nidcd.nih.gov](http://www.nidcdinfo@nidcd.nih.gov)

• American Academy of Audiology: [www.audiology.org](http://www.audiology.org)

• American Speech-Language Hearing Association: [www.asha.org](http://www.asha.org)

• National Coalition for Auditory Processing Disorders: [www.ncapd.org](http://www.ncapd.org)

• American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS): [www.entnet.org](http://www.entnet.org)
Helpful Books on (C)APD


Helpful Book on (C)APD


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www.drkevintblake.com
Hyperacusis
Hyperacusis

• A condition marked by super sensitive hearing.
• Often environmental sounds are so loud to them it is painful.

Hyperacusis

“Hyperacusis has been defined as ‘unusual tolerance to ordinary environmental sounds’ and more pejoratively, as ‘consistently exaggerated or inappropriate responses to sounds that are neither threatening nor uncomfortably loud to a typical person.’ Common to both is the implication that the experience can be evoked by sounds of low intensity and that sounds in general, rather than specific sounds are problematic.” (p. 582)

Vestibular Hyperacusis

“In vestibular hyperacusis, exposure to sound can result in falling or loss of balance or postural control...Some of the same reactions as with cochlear hyperacusis can also occur, along with sudden vertigo and nausea.” (p. 1 of 2)

➢ Other symptoms: loss of consciousness, confusion, fatigue, headaches

Vestibular Hyperacusis

• Causes:
  – Head/brain injury, chemical exposure, heart/artery disease, autoimmune disorders

• Treatment:
  – Low salt diet, anti-nausea drugs, anti-inflammatory drugs.

Loudness Recruitment

“Loudness recruitment describes an experience associated with cochlear hearing loss and specifically with dysfunction of the outer hair cells of the organ Corti: with a rising sound level, the perceived loudness increases faster than normal.” (p. 582)

“This phenomenon occurs because at some decibel level, the normal hair cells adjacent to the damaged hair cells (corresponding to the frequency of a hearing loss) are ‘recruited.’ At the decibel level at which these normal hair cells ‘kick in’, perceived loudness shoots up rapidly, causing discomfort.”  (p. 2 of 3)

Loudness Recruitment

- Typically occurs in people with high frequency hearing loss over the age 40.
- They have an abnormal perception of loudness and are overwhelmed by it.

Misophonia and Phonophobia

“Misophonia and Phonophobia can be defined as abnormally strong reactions of the autonomic and limbic systems resulting from enhanced connections between the auditory and limbic systems.” (p. 582)

- Phonophobia = Fear of sounds due to an emotional pairing. Usually the term used to describe lack of sound tolerance due to migraine headaches.
- Misophonia = Dislike of sounds due to an emotional pairing.


Note!

• Most people will find sounds at 120 dB or higher painful.
• The maximum comfortable loudness a person can tolerate depends on the individual.
• It can also depend on your mood and the type of sound.
  – The more stressed you are the less you can tolerate sound.
• Some sounds are intolerable to everyone i.e. fingers scratching a chalkboard.

Causes of Hyperacusis

- Note: In most cases no cause can be found.
- Facial nerve dysfunction
- Lyme disease
- William’s Syndrome: 95% report hyperacusis
- Middle cerebral aneurysm
- Multiple sclerosis
- Migrainous cerebral infarction
- Ear surgery*

Possible Causes of Hyperacusis

- 5 hydroxytryptamine dysfunction: This helps modulate auditory gain and determining the importance of particular sounds.


Temporomandibular Joint Syndrome (TMJ)

Author (2010). *Supplement.* From the Hyperacusis Network website:
Causes of Hyperacusis

“Specifically, improper function of the cochlear hair cells may result in a hearing loss secondary to the failure of these cells to propagate proper signals through the auditory centers. In response to an incongruous neural message, higher auditory cortical centers may adopt and remodel transmitted sound. This neuroplasticity may lead to an increased perception of volume in the auditory cortex (hyperacusis) and the perception of phantom sounds (tinnitus).” (p. 472)

Hyperacusis

- Poll of 65 AD/HD adults:
  - 50% reported hypersensitive hearing

Asperger’s Disorder and Hyperacusis

- 70 to 80% of those with Asperger’s Disorder have some form of Hyperacusis.
- The three types of sounds people with Asperger’s Disorder have difficulty with:
  - Sudden Unexpected Noises – dog bark, school fire alarm, etc.
  - High Pitched Continuous Noises - electric motors, toilets, etc.
  - Confusing Multiple Sounds – shopping mall, sporting event, etc.

Hyperacute Hearing

Some say that those with Autism Spectrum Disorders who are hypersensitive to sound have “hyperacute hearing,” instead of hyperacusis because they are born with it and only certain sound frequencies cause them problems.

Williams Syndrome and Sensitive Hearing

- Williams Syndrome is also known as Williams-Beuren Syndrome.
- “Williams Syndrome is characterized by cardiac defects, varying degrees of physical and developmental delay, stellate eye pattern, possible elevated serum calcium level, and elfin/pixie facial features.” (p. 339)
- 95% of people with Williams Syndrome have hyperacusis and 61% had significant otitis media as infants and small children.

Williams-Beuren Syndrome (WBS)

“To begin with, individuals with WBS experience strong aversion to certain types of sounds, independent of their loudness. The sounds tend to be spectrally broad-band sounds, such as those emanating from motors, fans, fireworks, and thunder. Compared to typically developing children and children with DNS (sic. Downs Syndrome) or Autism, the WBS individuals are more than three times as likely to have suffered from auditory aversions, with 91% of respondents reporting this (compared to 27% of individuals with Autism, and fewer than 7% of individuals with DNS or normal controls.” (p. 349)

Williams-Beuren Syndrome (WBS)

“WBS people may suffer from four different auditory abnormalities: lowered uncomfortable loudness levels, hyperacusis, auditory fascinations, and auditory aversions. We argue for some neural basis for some of these behaviours may be in hyperexcitability of cortical neurons...WBS tend to use different regions of their brains for processing music and noise, with particular emphasis on amygdala activation.” (p. 354)

Williams-Beuren Syndrome (WBS)

“Hyperacusis in Williams syndrome (WS) is associated with a high-frequency hearing loss resembling the configuration of noise induced hearing loss. The hyperacusis and hearing loss in WS may stem from a deficiency in the acoustic reflex resulting from auditory nerve dysfunction. Additional mechanisms that may mediate hyperacusis in WS and should be evaluated in future studies include recruitment, malformation of the facial canal, and haploinsufficiency of the elastin gene.” (p. 390)

Williams-Beuren Syndrome (WBS)

“Even as toddlers, children with William’s Syndrome are extraordinarily responsive to music...” (Oliver Sacks, 2007, p. 219)

“In many people with hyperacusis, increased activity develops in the tensor tympani muscle in the middle ear as part of the startle response to some sounds. The lowered reflex threshold for tensor tympani contraction is activated by the perception/anticipation of loud sound, and is called tonic tensor tympani syndrome (TTTS). In some people with hyperacusis, the tensor tympani muscle can contract just by thinking about loud sound. Following exposure to intolerable sounds, this contraction of the tensor tympani muscle tightens the ear drum, which can lead to symptoms of ear pain/a fluttering sensation/a sensation of fullness in the ear (in the absence of any middle or inner ear pathology). (Continued)
Tonic Tensor Tympani Syndrome (TTTS)

“...it does not harm the ear to experience TTTS and even though the TTTS symptoms can seem as if the ear is being damaged by some sounds, this is not the case.” (p. 2 of 3)

- Treatment of TTTS often involves sound desensitization and habituation wearing sound generators at low volume.

English Language Questionnaire for Hyperacucucis

Sensory Sensitivity Symptoms in Asperger’s Disorder


Prevalence of Hyperacusis

➢ Two Swedish studies indicated 8 to 9% of the population has hyperacusis.
➢ 40% of those with tinnitus have hyperacusis.
➢ 86% of those with hyperacusis have tinnitus.
➢ 48% of those with loudness recruitment complain of problems with attention as well as emotional and social concerns.

Prevalence of Hyperacusis

• Most researchers believe the worldwide prevalence of hyperacusis is about 2%.

Hyperacusis: Diagnosis

- Go to a “World Class” university medical center (i.e., Harvard Medical School, Vanderbilt Medical School, Mayo Clinic, UCLA Medical School, etc.) and have the following:
  - a thorough medical examination
  - a very detailed history taken (i.e., medical, family, educational, audiological, work, social, etc)
  - a thorough ear examination
  - a thorough hearing examination
  - a thorough hyperacusis examination that includes a loudness discomfort test.

Good Book On Hyperacusis

Treatment of Hyperacusis

- Some use exposure to “pink noise” with the hope that it will desensitize them to their hyperacusis.
- Pink Noise is similar to white noise.
- CDs with such sounds are available from the Hyperacusis Network, P.O. Box 8007, Green Bay, WI 54308; [www.hyperacusis.net](http://www.hyperacusis.net)
“There have been only a few studies outlining management for hyperacusis patients. Currently assessment indicates that the Jastreboff model for treating hyperacusis is the most widely accepted among practitioners. It is similar in purpose, to the Jastreboff approach for treating tinnitus: Tinnitus Retraining Therapy (TRT)...However, no one clinical approach has been sufficiently compelling to gain universal acceptance.” (p. 1 of 2)
TRT Therapy Developer

- Pawel J. Jastreboff, Ph.D., Sc.D., M.B.A.
- Professor and Director
- Tinnitus and Hyperacusis Center
- Emory University
- Atlanta, Georgia
- www.tinnitus-pjj.com
Hyperacusis Treatment in Asperger’s Disorder

“It is important to first identify which auditory experiences are perceived as painfully intense, with the child communicating distress by covering his ears, flinching or blinking in response to sudden noises, or simply telling an adult which sounds are hurting.” (p. 277)

Treating Hyperacusis in Those with Asperger’s Disorder

- Remove the sound from the environment
- Use sound suppression (i.e., silicone ear plugs, sound suppression – Bose Quiet Comfort headphones, a fan, etc.
- Explaining the cause and the duration of the painful sound may be helpful: Carol Gray’s “Social Stories” offer such information - http://www.thegraycenter.org/social-stories

Recruitment: Treatment

“New digital hearing aids are being developed which employ sound compression and volume control. These devices hold promise as technology improves however each person with recruitment is different and a good hearing aid would have to be customized to the patient’s recruited ears. In fact, the two ears on an individual with recruitment may have different levels of hearing loss, thus a pair of hearing aids may have to be tuned differently for each ear.” (p. 4 of 25)

The Hyperacusis Network (No Date) Supplement. From Website: www.hyperacusis.net/hyperacusis/supplement/default.asp.