



FEBRUARY 2026

NEUROAUDIOLOGY NEWSLETTER

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Co-Editor: Amy Bradbury, AuD

Founder: Frank Musiek, PhD

Happy New Year! Time to Start Filling in Your Calendars for Important Upcoming Events!

We are pleased to announce our 3rd Annual Virtual Symposium, Pathways: **Quest for the Best in CAPD/Neuroaudiology — A Clinical Journey Through APD: Past, Present, and Future.**

The symposium will take place on Saturday, March 28, 2026, beginning at 12:00 PM EST / 9:00 AM PST.

This virtual program will deliver expert, evidence-based, and practical diagnostic and management strategies for individuals with Central Auditory Processing Disorder (CAPD). The symposium will feature presentations by distinguished faculty, along with an interactive international panel discussion addressing complex CAPD management cases.

A unique emphasis will be placed on the key concepts and principles that have shaped the practice of CAPD over time, as well as a forward-looking exploration of the future of CAPD and neuroaudiology as envisioned by leaders in the field.

Distinguished Faculty include:

Drs. Jay Hall, Bill Keith, Jennifer Shinn, Bryan Wong, and Frank Musiek

Continuing Education Units (CEUs) will be provided.

Registration details will be forthcoming.

We hope you will join us for this engaging and informative event.

Best wishes,

Jennifer Shinn, PhD (Course Director)

Frank Musiek, PhD (Course Director)

Audiology Trivia

1. In what year was the masking level difference introduced by Hirsh and Licklider?

a) 1948, b) 1959, c) 1963, d) 1974

2. The length of the human basilar membrane is about how long?

a) 49mm, b) 32mm, c) 20mm, d) 12mm

3. The first musicians' earplug with "flat" 15 dB attenuation was developed by who?

a) Staab, b) Berger, c) Killion, d) Rudmose



NeuroAudiology/CAPD Corner

TOPIC: DOES APD EXIST?

AUTHOR: BILL KEITH, PHD



Psychologist and hearing researcher, Professor David Moore, has long contended that most cases of auditory processing disorder (APD) can be explained by cognitive, attention and language factors – with little discussion of the inverse possibility that deficits in these related areas may in fact be a consequence of a hearing problem. He proposes that auditory processing disorders should be referred to as “listening difficulties”: “I propose that most of the developmental immaturity and central impairment in hearing and listening found in children from 6 years of age onwards is due to their inability to attend, understand, and remember challenging auditory tasks rather than an auditory processing disorder.”; “Most children referred for APD evaluation have normal hearing and are more likely to have attention, language, or other cognitive difficulties than a specific auditory disorder.”; “...most if not all cases of childhood APD really reflect learning or language disorders.” (Moore 2018a, 2018b, 2018c).

In 2018 Moore wrote an editorial in the journal *Ear and Hearing* prohibiting the common usage of the term “APD” in the journal: “...effective immediately, articles that either implicitly or explicitly assume APD as a single diagnostic characteristic of the auditory system likely will not be considered for publication.” (Moore 2018c). There was a robust response from the audiology fraternity to this imposition of censorship, and the Editor-in-Chief intervened and restored open access for APD research.

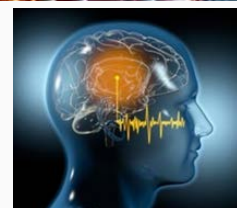
However, the characterisation of APD as a “listening difficulty” and the one-way interpretation of associations between hearing and cognition (that hearing difficulties are due to cognitive factors rather than cognitive factors being a consequence of impaired audition) continue to be propounded. “The most striking difference between children with and without LiD (listening difficulties)... was the consistently poorer performance of the children with LiD across the NIH Cognition Toolbox tests (Petley et al, 2021), supporting the hypothesis that LiD is primarily a cognitive impairment rather than an auditory sensory problem.” (Moore et al, 2025).

Engineer and hearing researcher, Professor Harvey Dillon, in his research to separate APD from other disorders, does not argue that APD is in most cases a cognitive issue, but does also use the cognitively loaded term “listening difficulties” to encompass APD. Vermiglio (2014, 2018) questions the entity of APD describing it as “ambiguous” and “controversial”.



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These opinions and terminology choices are sometimes seized on and distorted into highly damaging communications to clinical and educational service providers and consumers: “APD is not a diagnosis that helps kids in schools. It’s a diagnostic label that obscures the real issue: language and literacy. It misleads teams and delays the evidence-based intervention children urgently need.”; “APD is a diagnostic detour that wastes precious time and money while offering no path to functional academic support.”; “APD Is a Broken Diagnosis.”; “....it’s important to start thinking regarding possible incentives a professional might have to continue performing APD testing and making prescriptive program recommendations despite all the existing evidence refuting the validity and utility of APD diagnosis for children presenting with listening difficulties.” Elleseff (2017, 2025).

The damaging effects of assertions that APD is not a valid entity, or is at most a rare condition, result in the denial of helpful treatment for children and adults with APD. We have seen a major treatment service cease staff training in APD and referring children with dyslexia (most of whom will have underlying auditory disorders) because professionals have come to believe APD is not a valid entity. Just the term “listening difficulties” turns people away from audiological services. If it’s not an auditory problem why consult an audiologist? Contention about APD inhibits audiologists from providing APD services, can marginalise practising APD providers as fringe practitioners, and can sow distrust in the audiology profession. All this can lead to a return to children with APD being treated by psychologists, speech language pathologists and special education personnel without audiological involvement, a situation previously shown to be severely wanting (Esplin and Wright, 2014).

Association is not causation. Attention and other cognitive factors may affect performance on behavioural (though not objective) tests of auditory function, but equally hearing disorders adversely affect language, attention and cognitive ability. We must be wary of confirmation bias influencing interpretation of results in either direction. Multiple avenues of research support the inverse possibility that cognitive deficits can be the result, not cause, of hearing difficulties.

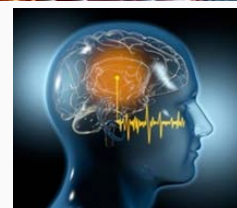
Mondelli et al (2010) assessed attention in children with mild hearing loss. Performance on the sustained auditory attention ability test was influenced by the presence of mild hearing impairment. Since the hearing disability was sensorineural it cannot be so easily dismissed as a cognitive deficit. Some cases of APD may be consequences of auditory deprivation (e.g., from middle ear disease) in early childhood. Animal studies support this possibility (Whitton and Polley, 2012, Polley et al, 2013). That the cause is auditory makes it more likely the disability is also auditory.



NeuroAudiology/CAPD Corner

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AUTHOR: BILL KEITH, PHD



Neuroanatomical, imaging and electrophysiological studies provide objective evidence, free of cognitive and language confounds, of central auditory nervous system differences associated with auditory processing deficits (Boscariol et al, 2010; Farah et al, 2014; Mattson et al, 2019; Hornickel et al, 2012). Hornickel and Kraus (2013), commenting on their findings of abnormal neural transmission of auditory information at brainstem level in children with dyslexia, concluded as follows: “Poor readers often have a host of auditory, linguistic, and attention deficits, including abnormal neural representation of speech and inconsistent performance on psychoacoustic tasks. We hypothesize that this constellation of deficits associated with reading disorders arises from the human auditory system failing to respond to sound in a consistent manner”.

A large body of research by Goswami and colleagues at the University of Cambridge provides considerable evidence supporting the proposition that dyslexia stems from auditory deficits: “There is growing evidence regarding the core cognitive deficit in phonology that dyslexic difficulties are related to auditory sensory impairments, particularly regarding discrimination of amplitude envelope rise times (Goswami et al, 2021); “... phonological difficulties and subsequent literacy difficulties in affected children are primarily related to impaired processing of low-frequency [envelope] information, a difficulty that is present from infancy.” (Flanagan et al, 2025).

Research in France and Belgium supports this: “The strongest relationships in this study were between both rise time and frequency discrimination and rhyme awareness. This fits with the developmental framework proposed here, whereby auditory processing influences reading acquisition through its effects on a child’s ability to extract phonological information from the speech stream” (Corriveau et al, 2010). A study showing instantaneously improved hearing ability in participants with dyslexia as a result of an acoustic enhancement to syllabic onsets (even for language-free vocoded “speech”) provided strong evidence that impoverished speech perception in dyslexia cannot be explained by lower general cognition, phonological skills, or reduced verbal abilities (van Hirtum et al, 2019).

Treatment with another purely auditory intervention, remote microphone hearing technology, has been shown to gradually and permanently improve attention, memory, literacy, and other aptitudes, unaided, in people with APD (Keith and Purdy, 2014; Keith et al, 2023). The auditory nature of the intervention supports the possibility that the causative condition was at least in part auditory.

Tomlin & Vandali (2019) assessed cognitive skills before and after a temporal patterning auditory training task. Temporal patterning ability improved but no significant change was evidenced across the cognitive skills assessed post-training, and no correlation was found between any individual changes in cognitive and temporal patterning ability, supporting that the deficit was auditory.



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Visual processing deficits are not termed “looking difficulties”. Likewise, we should think carefully before succumbing to pressure to adopt the term “listening difficulties” with its cognitive connotations to describe APD and other conditions. There is a suitably neutral alternative to the word “listening” that avoids both inclusion or exclusion of possible cognitive factors. It is “auditory”. And if confronted with the proposition that APD is a rare or non-valid entity, I suggest inquiring whether this is because the central auditory nervous system does not exist, or it exists but nothing ever goes wrong with it.

NeuroAudiology/CAPD Corner References

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Upcoming Conferences

American Auditory Society

February 26-28, 2026, Scottsdale, AZ

Joint Defense Veterans Audiology Conference

March 9-11, 2026, Orlando, FL

American Academy of Audiology

April 22-25, 2026, San Antonio, TX

Acoustical Society of America

May 11-15, 2026, Philadelphia, PA



Trivia Answers

1. (A) The masking level difference was introduced in 1948.
2. (B) The human basilar membrane is about 32mm.
3. (C) The first musicians' earplug was developed by Wayne Staab.

Learning Corner

The learning corner will offer citations of articles that may contribute to one's knowledge base for CAPD/NeuroAudiology.

- Colette, E.D., Leite Filho, C.A., Rabelo, C.M., Musiek, F., & Schochat, E. (2025). Click ordering lateralization test: Applicability and feasibility of a new paradigm for assessing sound lateralization behavior. *International Journal of Pediatric Otorhinolaryngology*, 189, 112215.
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Important Update from November 2025 Newsletter

In the November 2025 Newsletter, an important topic was discussed in the CAPD Corner: Auditory Processing, Language, and Literacy, with a focus on dyslexia. An update to that content, which was inadvertently omitted from the previous edition, is provided below.

Professor Vivian Iliadou and colleagues in Greece, in collaboration with Professor Doris-Eva Bamiou at University College London, have studied rhythmic ability in children diagnosed with APD. Children with APD show impaired rhythmic perception. Unlike typically developing children their performance on a speech recognition in noise task does not benefit from rhythmic priming (prior accustomisation to the speaker's speech rate). The results are not explained by poor attention^{12,13}.

12. Sidiras, C., Iliadou, V. V., Nimatoudis, I., & Bamiou, D. E. (2020). Absence of Rhythm Benefit on Speech in Noise Recognition in Children Diagnosed With Auditory Processing Disorder. *Frontiers in Neuroscience*, 14, 418.

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