



# VoicePro: Reading and APD Applications

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## LEARNING OUTCOMES

1. Participants will identify three key points for implementing enhanced auditory instruction utilizing the VoicePro system across all disciplines while working with individuals diagnosed with auditory processing weaknesses, dyslexia, or other learning challenges.
2. Participants will demonstrate three or more multi-modal strategies for therapeutic and/or classroom instruction which promote engagement and attention while building stronger neurological foundations for learning.
3. Participants will correlate three or more learning barriers to reading comprehension with intervention strategies that will address weaknesses from a foundational level while incorporating technology enhancements to remediate learning gaps.

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Individuals with weaknesses in literacy development, auditory processing, and/or related skills can be compared to those who are trying to climb a mountain without sufficient foundational skills or equipment to master the environmental changes occurring along the way.

To manage or overcome the challenges, a team approach is needed to address foundational skills, environmental modifications/enhancements, higher order (language and cognitive) skills, and compensatory strategy needs.

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### AUDITORY PROCESSING DEFICITS

- Has difficulty understanding verbal directions
- Stops listening to "figure out" what is being said
- Works "overtime" to understand auditory information
- Has difficulty understanding jokes and sarcasm (tone of voice)
- Experiences challenges with understanding paragraph-length spoken information
- Says "huh" or "what" frequently
- Recalls only part of a verbal message
- Misunderstands words due to discrimination problems
- Appears to tune out or daydream

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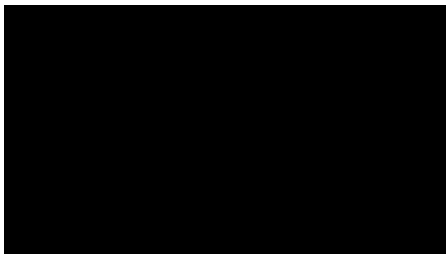
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### AUDITORY PROCESSING & AUTISM




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### READING CHALLENGES

- Often has a right ear weakness/left ear dominance
- Has difficulty rhyming
- Has difficulty with sound-symbol relationships
- Unable to accurately blend sounds into words
- Demonstrates a weak phonics foundation
- Has poor reading fluency
- Demonstrates poor written expression




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## LEARNING BARRIERS TO READING COMPREHENSION



- Auditory Processing Disorder
- Vocabulary Weaknesses
- Weaknesses in Phonological Awareness and Phonics
- Visual Disturbances (Acuity, Oculomotor, Perceptual)
- Working Memory Deficits
- Executive Function Weaknesses
- Directionality Deficits
- Spatial Orientation Weaknesses

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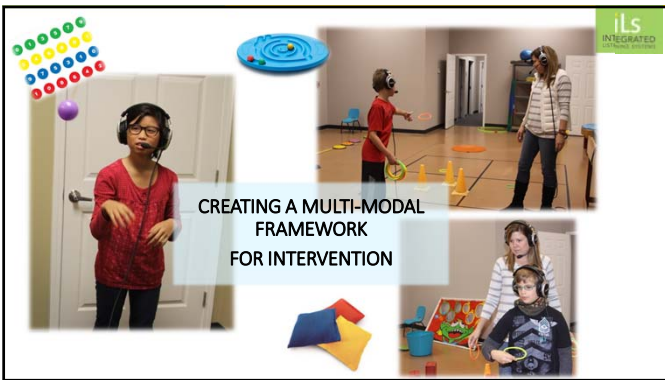
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**Auditory Discrimination**

- Speech Targets (Sounds/Words)
- Non-Speech Targets (Loudness, Pitch, Duration)

**Auditory Closure**

- Filtered Words Listening Tasks ("Muffled," Unclear Speech)

**Binaural Integration & Separation**

- Dichotic Listening Tasks (Differing Words or Phrases to Opposing Ears)
- Localization Training (Identification of Sound's Location/Origin)

**Temporal Processing**

- Sweep Direction Identification (Identification of Increasing or Decreasing Pitch Changes)
- Toning Patterns (High-Low Pitch Variations & Identification)

**Competing Acoustic Signals**

- Auditory Figure Ground Listening Tasks (Speech in Noise)

### BOTTOM-UP TREATMENT APPROACHES

"A growing body of research indicates that inclusion of direct skills remediation, or bottom-up therapy, can change auditory behavior."...  
Geffner & Ross-Swain, 2013  
(ASHA, 2005b; Bellon-Harn, Harn, & Watson, 2007; Chermak, 1998; Chermak & Musiek, 1997; Ferre, 2010)

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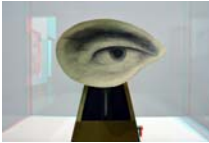
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## AUDITORY TEMPORAL PROCESSING SKILLS

- Auditory Associations
- Auditory Sequencing
- **Rapid Perception**
- Same-Different Tasks



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## READING AND APD CONNECTIONS

- Weaknesses in phonological decoding and primary word recognition (sight word) decoding abilities are associated with auditory temporal processing deficits.
- Individuals with reading disorders demonstrate a significantly higher number of errors in discrimination of duration and frequency patterns (i.e. temporal processing tasks).
- Children with reading disorders tend to have greater deficits in non-speech temporal processing than adults with reading disorders, possibly due to immature or underdeveloped auditory systems.

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- Phonological Awareness**
  - Rhyming Activities
  - Same/Different Auditory Word Comparisons
  - Phoneme Manipulations
  - Sound Blending
  - Decoding
- Auditory Memory**
  - Digit Span (Forward and Reverse)
  - Multi-step Directions
  - Word or Sentence Recall
- Auditory Comprehension**
  - Answering Questions/Recalling Information
  - Following Directives in Contextual Situations
- Auditory Cohesion**
  - Problem-Solving/Reasoning
  - Auditory Associations
- Metacognitive Strategies**
  - Subvocalizing, Chunking, and Mnemonics
  - Visualizing
  - Compensatory Strategies

### TOP-DOWN TREATMENT APPROACHES

Effective auditory processing is also dependent on other higher order cognitive communication skills such as phonological processing, linguistic processing (comprehension & interpretation of auditory input), executive functioning, and metacognition. (Geffner & Ross-Swain, 2013)

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### A COLLABORATIVE MODEL FOR TREATMENT




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### GETTING STARTED



#### A Multi-Modal Intervention

- ✓ Addresses foundational skills
- ✓ Implements environmental modifications/enhancements
- ✓ Addresses higher order (language and cognitive) skills
- ✓ Supports compensatory strategy needs

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### TARGETED SKILLS




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### ADDRESSING MULTISENSORY NEEDS

- Listeners are bombarded daily with sensory information that must be processed quickly and effectively.
- The auditory, visual, vestibular, and tactile systems play key roles in this information processing.
- When an individual does not have full access to the acoustic signal (speech), he or she cannot succeed in school, work, or other daily activities.

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### AUDITORY TRAINING

- Enhance the auditory signal with amplification/assistive technology
- Provide direct skills remediation (bottom-up and top-down approaches)
- Implement auditory and movement tasks simultaneously for functional gains
- Teach metacognitive strategies

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### TASK PROGRESSION

- Begin task challenges near skill thresholds
- Address tasks as an isolated skill and then comparatively add in movements to address multi-tasking
- Progress the movement pattern(s) to a greater complexity
- Add in music or noise at a background level
- Modify challenges if frustration occurs

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### IMPLEMENTATION TIPS

- Use both recorded stimuli and natural voicing
- Implement auditory and visual stimuli simultaneously when needed and then progress task complexity by fading visual prompts
- Begin with rhythmic, sequential (movement) activities to activate subcortical processing in order to establish a foundation for improved fluency and temporal processing with reading tasks
- Utilize VoicePro programs for 15-30 minutes of a session
- Monitor for signs of auditory fatigue

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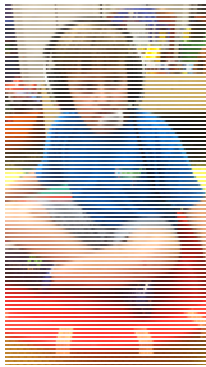
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### SIGNS OF AUDITORY FATIGUE

- Withdrawal from task/"escape" behaviors
- Frustration
- Shortness of breath
- Visual distractibility
- Agitation/irritability
- Noncompliance
- Fidgeting/pulling on headphones
- Pushing microphone away
- Stuttering/dysfluencies in absence of a disorder

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## DEMONSTRATION OF ACTIVITIES



It has also been documented that stimulating the vestibular (inner ear) and cerebellar (motor activity) system through movement activities (spinning, crawling, rolling, jumping, bending, etc.) can result in "significant gains in attention and reading." (Jensen, 2005, 62).

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## VoicePro Benefits



- Allows for direct auditory training with air and bone conduction to activate expressive and receptive language pathways
- Provides unique access to establish binaural integration and separation
- Establishes variability between recorded and spoken communication to expand auditory engagement
- Provides clarity to the sound source for compensatory needs while directly addressing remediation for improved comprehension

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## Movement

- Playbook Activities  
MeMoves  
Brain Breaks  
Brain Gym  
Sensorcises

## Music

- Calming  
Sensory-Motor  
Speech-Language  
Songs with Lyrics

## Multi-Tasking sequential Processing

- Attending  
Listening  
Scanning  
Balancing  
Moving  
Discriminating  
Analyzing  
Organizing  
Remembering




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**USING TECHNOLOGY - AMPLIFICATION**

• **VoicePro (iLs)**



- Apps-  
Ear Machine  
i-Hear

*ILS INTEGRATED*

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**USING APPS WITH VOICEPRO**

- Sound Match
- Touch the Sound
- Lumpty Learning
- Drum Challenge
- Simon Sings
- MelodyMelody
- iDichotic
- Dichotic Interaural Intensity Difference Training (DIID)
- Hear Coach
- Auditory Workout

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