

Patient Population

- 18-36 months
- Limited or no expressive language
- Average to good receptive language
- Probable good cognitive skills

Differential Diagnosis?

- Severe Expressive Language Delay
- Severe Phonological Disorder
- Childhood Apraxia of Speech

ASHA 2007 Definition

- Preferred terminology is now Childhood Apraxia of Speech (CAS)
- Key components of definition:
 - Neurological childhood speech sound disorder
 - Affects precision and consistency of movements that effect speech sound production and prosody
 - Occurs in the absence of other neuromuscular deficits (e.g. abnormal reflexes, abnormal tone)
 - For further information about the recent position statement visit www.asha.org

ASHA Addressed 6 major areas

- 1) Non-speech motor, 2) Speech production, 3) Prosody, 4) Speech perception, 5) Language, 6) Metalinguistic/literacy

Speech Motor Production

- reduced vowel inventory
- vowel errors
- inconsistency of errors
- increased errors in longer or more complex syllable and word shapes (especially omissions, particularly in word-initial position)
- groping
- unusual errors that “defy process analysis”
- persistent or frequent regression (e.g. loss of words or sounds that were previously mastered)
- differences in performance of automatic (overlearned) versus volitional (spontaneous or elicited) activities with volitional activities more affected
- errors in the ordering of sounds, syllables, morphemes, words.

Prosody

- Most consistent finding in the literature
 - May not see errors, but may not see ability to change... important for treatment

The debate: Apraxia vs. phonology

- A phonological disorder
- Linguistic vs. motor: When children present with severe speech production problems, the question is- IS THIS LINGUISTICLY OR MOTORICLY BASED?
- The problem is, it is NOT that simple
- Do children with apraxia also present with phonological disorders?
- Are apraxia and phonological disorder distinct?

Possible co-occurring conditions

- Overlap with other disorders
 - Autism
 - Dysarthria (Davis & Velleman, 2000)
 - Down syndrome

- Cerebral palsy
- Fine/gross motor (Maassen, 2002, Newmeyer et al., 2007)
- *****Treatment needs to affect the most limiting deficit... e.g autism... down syndrome, and long term prognosis

How do you know when to diagnose?

- Assuming you do not have the time and/or resources to go through the protocol Lewis et al. (2004) used, how would you as a clinical SLP make this diagnosis?
- There currently is NOT a clear cut, well accepted, normed assessment available for the accurate diagnosis of apraxia
- Remember at the beginning of the presentation we stated there is no agreed upon definition therefore there is not likely to be such a tool anytime soon
- Next we will discuss factors to take into consideration when considering this diagnosis
 - Diagnosis is based on a cluster of signs gathered from:
- Receptive and expressive language skills
 - Based on current research, you should NOT diagnose apraxia in children who are completely non-verbal
 - Receptive language should be (but not always) age appropriate or at least superior to expressive language
- Case history
 - Are there any other signs in their history that may indicate an overall motor planning or neurological condition?
 - Especially in the area of motor development (fine and gross)
 - Hx should include a hearing test!
- Treatment history
- Series of articles by Shrieberg & Aram indicates resistance to traditional treatment is a criterion for the diagnosis of apraxia, not as common today

Late-Talkers

- Rescola, L. (2009)
- 17 year olds, normal receptive language at initial testing
- Summary
 - Language skills within national average range during school age, but still different

Long Term Outcomes- CAS

- Lewis et al. (2004)
 - 3 groups of children recruited at preschool age and followed to 8-10 years of age (CAS, speech only (non-CAS), speech and language)
 - Compared the results of various developmental assessments of speech, language, cognitive, and academic skills over time

Lewis et. al – Outcomes for CAS group What does this mean?

- Children are at-risk for later language and language-learning delays

Neurological Change What Exactly are We Trying to Change?

- Speech Motor Control
- Language
 - Semantics
 - Phonology
 - Syntax
- Pragmatics?

How Do We Change Things? Motor Learning Theories

- Schema theory

To learn and TRANSFER a motor skill

- Many vs. Few Trials?
- Mass vs. Distributed
- Variation vs. Constant
- Blocked (successive) vs. Random (unknown)
- Focus internally (movements) vs. externally (outcome of movement)
- Simple (part) vs. complex (whole)

Principles of neuroplasticity-based training

- Daily intense training and practice schedules
- Heavy repetition
- Signals to promote active attention to each training trial
- Tasks that require a response for each stimulus
- Immediate feedback about the correctness of the response
- Trial-by-trial tracking of response accuracy
- Adaptivity: gradual increases or decreases in the difficulty level in order to maintain a constant success rate
- Rewards for effort and success

Gilliam & Loeb (2010). *ASHA Leader*.

Structure of Therapy Sessions

- Depends on the setting
- Depends on the age
- Depends on what you have available
- Depends on what type of carryover you think you can facilitate

Home-Based Sessions

- Warm-up/intro period
- Work/play directly with the child
- Parent-report and/or education

Clinic-Based Session

- Warm-up/intro period
- Work/play directly with the child
- Parent-report and/or education

Center-Based

- Circle time
 - Songs, songs, and more songs
 - Characters on a stick
 - Bubbles and concepts
 - Identify emotions
 - Who are you?
 - Repeat the same songs

Center-Based Session/General

- Warm up
- Some type of craft
- Circle time
- Free play/center
- Snack
- Gross Motor

Where to Start

- Have always believed in functional therapy goals including...
 - Functional vocabulary
 - Core vocabulary

Therapy Plan

- Can keep ultimately the same for multiple sessions
- This will HELP the child!

Common CAS Therapy Approaches

- Motoric Syllable Structure
- Touch Cues
- DDTS
- IST/DTTS

Verbal Goal Hierarchy for Verbal Child

- To produce CV and VC syllable structures
- To produce VCV syllable structures
- To produce CVCV syllable structures
- To produce VCVC syllable structures
- To produce CVCV syllable structures with alternating vowels
- To produce CVCV syllable structures with alternating consonants
- To produce CVCV syllable structures with alternating vowels and consonants
- To produce CVCVCV syllable structures with alternating vowels and consonants
- To produce CVC syllable structures
- To produce CVCV syllable structures with assimilation of posterior and anterior positions

One caveat..

- Compromise and balance between language and speech
 - How much language do you give up for speech production?
- Really need to think about in children who are acquiring language simultaneously vs. adults who have language but not speech
- Need to choose targets that will not frustrate the child... for example

Touch Cues

- Touch Cues (Bashir et al., 1984)

Integral Stimulation Therapy/DTTS

- Integral Stimulation Therapy (Strand & Debertine, 2000; Strand & Skinder, 1999; Strand, 2009)
- Facilitates motor performance and motor learning for speech patterns

How does this differ from other types of speech therapy?

- The next slide is the Hodson therapy progression (phonological treatment)
- Focus on the early developing patterns
- Ask yourself: is there a significant difference between targets for apraxia versus targets in phonological therapy?

Common Linguistic Therapy Approaches

- Hodson
- Milieu strategies
- General language strategies
 - Modeling
 - Expansion

- Routines
- labeling

Milieu and Responsiveness Strategies

- Responsiveness Strategies
 - Incidental Teaching
 - Time delay
 - Modeling
 - Additional Strategies include...
- Remember this is child- led intervention
- Look for other methods of communication
- Fey et al., 2006; Warren et al., 2008; Girolametto & Weitzman, 2002; Girolametto, Weitzman, & Clements-Baartman, (1998); Girolametto, Pearce, & Weitzman, (1996)

Evidence-Based Outcomes

- DeThorne, Johnson, Walfder, Mahurin-Smith. (2009)
- Access to AAC
- Minimize pressure to speak
- Imitate the child
- Exaggerated intonation and slower tempo
- Increase/supplement feedback methods
- Avoid emphasis on non-speech movements

Some of my favorite toys

- Anything with a ball that moves
- Anything that sings and stops
- Blocks
- Wind-up toys
- Flashlights
- Farms/zoos
- Empty peanut-butter jars
- Peek-a-Blocks
- Popper toys, including Jack-in-the boxes
- Big, bouncy balls
- Bean bag
- Light up piano
- Rain stick
- Fish bowl
- Pretend play items (older and/or higher functioning children)
- Radios/music players
- Computers??????

Books, Books, and More Books

- Board books are better at this age
- Can use for receptive and expressive language development
- Simple books with big, clear pictures and/or drawings
- Sometimes just have to go with what is there

And that's all!