

1) Definitions of Childhood Apraxia of Speech (CAS)

Write down the characteristics that are essential to the diagnosis of childhood apraxia of speech. You may include as many characteristics as you want. Indicate the basis for your decision to use these criteria.

2) Definitions

- a) Terms
 - i) Developmental apraxia of speech
 - ii) Developmental verbal dyspraxia
 - iii) Childhood apraxia of speech
 - iv) Persistent speech sound disorder

- b) Phonological disorder
 - i) Linguistic
 - ii) Prevalence

- c) Dysarthria
 - i) Motor execution
 - ii) Causes

- d) CAS
 - i) Motor planning or programming problem
 - ii) Etiology

3) Praxis

- a) Definition
- b) Apraxia and dyspraxia
 - i) Types
 - ii) Relation to speech
- c) Motor planning
 - i) Specification of units for production
- d) Motor program
 - i) Specification of how units are produced
 - ii)

4) Differentiation from other problems

- i) May be part of syndrome
- ii) No linguistic problem
- iii) No execution problem

5) Perceptual features of acquired apraxia of speech (AOS)

- a) Consonant & vowel errors
- b) Numerous and varied off-target attempts
- c) Highly inconsistent errors
- d) Sound, syllable, word segregation
- e) Sound distortions
- f) Increasing errors with utterance length
- g) Error awareness
- h) Slow rate
- i) Receptive/expressive gap
- j) Imitation problems
- k) Automatic speech is better than “volitional”

6) History of CAS

- a) Hadden (1898)
- b) Morley (1957)
- c) Yoss & Darley (1974)
- d) Williams, Ingham & Rosenthal (1981)
- e) Ozanne (1995)
- f) Bradford & Dodd (1996)
- g) Shriberg, Kwiatkowski & Aram (1997)
- h) Davis, Jakielski, & Marquardt (1998)
- i) Forrest, Dinnsen & Elbert (1997)
- j) Forrest, Elbert & Dinnsen (2000)
- k) Forrest (2003)

Differential diagnosis of speech acquisition problems

- 1) Phonetic inventory
 - a) Standardized test – Is sound produced?
 - b) Stimulability
 - i) Carter-Buck (1956) test
 - ii) Sound play
- 2) Phonemic inventory
 - a) Standardized test – Is sound used correctly
 - b) Dedicated probes
 - i) PKP (Gierut, Elbert & Dinnsen, 1987)
 - ii) Sound specific tests
- 3) Sequencing and phonotactics
 - a) Standardized test – Is sound influenced by position in word or context?
 - b) DDK with varied sounds
 - c) Familiar objects (e.g. Pokeman cards; cartoon characters)
 - d) Words in sentences
- 4) Consistency
 - a) Standardized test – Is same sound used for errors?
 - b) Repetitions of same word from 3c, above
 - c) Repetition of DDK
- 5) Oral structure and function
 - a) Robbins & Klee (1983) – Any organic problems?
 - b) Volitional oral movement test (Spriestersbach et al., 1978)

Treatment overview for CAS

- 1) Treatment goals
 - a. Develop communication system
 - b. Stimulate oral communication
 - c. Increase phonetic inventory
 - d. Develop phonemic accuracy
 - e. Increase consistency
 - f. Improve vowel production
- 2) General principles of motor learning
 - a. Practice
 - i. Practice schedule
 - b. Feedback
 - i. Knowledge of results
 - c. Simple versus complex behavior
 - d. Part-whole transfer
 - e. Retention
 - f. Motor “memory”
 - g. Generalization
 - h. Application to related behaviors
- 3) Practice schedules
 - a. Blocked
 - b. Random
- 4) Knowledge of results
 - a. Information provided
 - b. Frequency of feedback
 - c. Interval from response
 - d. Bandwidth feedback
- 5) Part-whole transfer
 - a. Segmentation
 - i. Decomposition of a behavior in time or space
 - b. Fractionation
 - i. Target behavior is broken down into independent units
 - c. Simplification
 - i. Difficult task is made easier by adjustment of one or more characteristics
- 6) Treatment target
 - a. Complex versus simple
 - b. Impact on learning
- 7) Criteria for termination
- 8) Steps in treatment
- 9) Criterion levels
- 10) Generalization

- 7) Types of treatment for CAS
 - a) Tactile-kinesthetic, motokinesthetic
 - b) PROMPT
 - c) Rate reduction
 - d) Rhythmic therapies
 - e) MIT
 - f) Linguistic approaches
 - g) Other
 - h) Core vocabulary
- 8) Stimulability
- 9) Complexity
- 10) Who is involved in treatment?

Final case

Background:

Annie was seen in the clinic because of concerns about her speech and language delays. A primary source of concern for Annie's family was the reason for the speech/language problems. Medical records indicated that Annie was developing typically until about 12 months of age when she started having seizures. The seizures were controlled with medication until Annie was about 5 years old when dietary adjustments seemed sufficient to control the problem.

Annie's mother also reports delays in Annie's fine and gross motor development. Also, Annie's mother indicated that her child did not babble very much.

Annie is currently enrolled in Kindergarten and other day programs. She receives speech-language services from the school system.

Speech:

A conversational speech sample was elicited. Results indicated that Annie had a severe intelligibility deficit when communicating with an unfamiliar listener; however, Annie used a rudimentary sign system that was understood by family members.

A 150 word probe was administered to assess Annie's production of sounds in various word positions. The results of this analysis indicated that Annie could produce the following sounds:

<i>Bilabial</i>	<i>Labiodental</i>	<i>Interdental</i>	<i>Alveolar</i>	<i>Palatal</i>	<i>Velar</i>	<i>Glottal</i>
m, w, p, b	f,v		n, s,z, t,d	j	k,g	h

Sounds that were missing from her inventory are presented on the slide.

Physiology:

Two assessments were performed to evaluate Annie's laryngeal/respiratory control for speech. The first task was a maximum phonation duration (MPD) evaluation that had Annie produce the vowel /a/ for as long as possible. Multiple attempts with clinician models were undertaken. Across the repeated trials, Annie averaged a MPD of 5-7 seconds which is about half what is expected for a child of her age.

An aerodynamic assessment of Annie's laryngeal resistance was performed. This evaluation indicated excessive laryngeal resistance during speech production (again, about twice what is typically found in a child of Annie's age).

A third evaluation was undertaken to assess Annie's oral-motor structure and function. Results indicated weakness in the lips and some tremors in the tongue. The tremors were worse when Annie protruded her tongue.

Questions for discussion:

- 1) What other tests would you do?
- 2) What other information would you want from the family/doctors?
- 3) Based on the information provided, what are likely sources of problems for speech/language development?
- 4) What would you include as treatment targets to improve functional communication?
- 5) What would you include to improve speech production?
- 6) What advice would you give the family?

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