Childhood Dysarthria

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What is Childhood Dysarthria?

A group of motor speech disorders that affects the neuromuscular execution of speech

Characterized by abnormalities in:
- CNS and/or PNS
- Neuromuscular features, including: strength, steadiness, tone, accuracy, and speed and range of movement

Can affect ALL systems necessary for speech:
- Respiration, phonation, articulation, resonance, and prosody

(van Mourik, Catsman-Berrevoets, Paquier, Yousef-Bak, & van Dongen, 1997; Duffy, 2005)
Types and Symptoms

- Flaccid – Weakness
- Spastic – Rigidity
- Ataxic – Incoordination
- Hypokinetic – Rigidity; Problems with initiating movement
- Hyperkinetic – Involuntary movements
- Unilateral Upper Motor Neuron – Weakness; Incoordination
- Mixed – Variable

(Duffy, 2005; Andrianopoulos, 2008)
Childhood Dysarthria

- **Congenital or Developmental:**
  - The neurologic insult takes place at birth or prior to the development of speech and language

- **Acquired:**
  - The individual may have developed some speech and language skills prior to the neurologic insult

(Caruso & Strand, 1999)
Speech Characteristics

- Marked difficulties with strength, speech, and accuracy of articulatory movement.
- Weak vocal quality (lack of respiratory support)
- Hypo- or hypernasality
- Weak articulatory contacts
- Rapid or slow speaking rate
- Distortion of vowels that involve spreading intrinsic tongue muscles:
  - /i/, /ai/, /ei/, and /ɔɪ/.
- Imprecise or weakly targeted consonants
  - /r/, /l/, and /s/
- Generally weak, mushy, garbled, imprecise speech

(McCaffrey, 2008)
Non-Speech Characteristics

- Difficulties with:
  - Sucking
  - Chewing
  - Swallowing

- May cause:
  - Drooling
  - Gagging
  - Choking

(McCaffrey, 2008)
Disorders/Syndromes Associated with Childhood Dysarthria

**Neurodevelopmental:**
- Spina Bifida and Hydrocephalus

**Genetic:**
- Fragile X syndrome

**Chromosomal:**
- Down’s syndrome

**Sporadic:**
- Prader-Willi syndrome
Neurodevelopmental:
Spina Bifida with Hydrocephalus (SBH)

- Spina Bifida: Incomplete fusion of the vertebral column
- Hydrocephalus: Excess of cerebrospinal fluid (CSF) in the brain → Enlarged skull
- SBH: Malformation of the cerebellum
  - Ataxic dysarthria
- Three clusters of speech:
  - Articulatory inaccuracy
  - Prosodic excess
  - Phonatory-prosodic insufficiency

(Bhatnagar, 2002; Huber-Okrainec, Dennis, Brettschnerider, & Spiegler, 2002)
Genetic:
Fragile X Syndrome

- Prevalence: 1:4,000
- Cause: Mutation of FMR1 gene on the X chromosome
- Speech is characterized by:
  - Dysarthria
  - Dyspraxia
  - Articulatory distortions and substitutions

Chromosomal:
Down’s Syndrome

- Prevalence: 1:1,000
- Cause: A third 21st chromosome → Trisomy 21
- Primary feature: Hypotonia → Dysarthria
  - “Floppy”

Speech is characterized by:
- Low pitch
- Hypernasality
- Breathiness
- Articulatory distortions
- Increased rate
- Reduced prosody

(Jung, Gagne, Godden, Leeper, Moon, & Seewalk, 1989; Shprintzen, 2000)
Sporadic: Prader-Willi Syndrome

- Prevalence: 1: 12,000-15,000
- Cause: Deletion on chromosome 15q11
  - Long arm of the paternally derived chromosome
- Delayed motor development secondary to hypotonia
  - Flaccid dysarthria
- Speech is characterized by:
  - Hypernasality
  - Reduced intelligibility
  - Articulation errors

(Stark, 2006; Prader-Willi Syndrome Association, 2008)
Treatment

- Depends on type and severity of symptoms
  - Children generally receive a better prognosis than adults due to neural plasticity
- Intervention is not a “one size fits all” solution
  - Beneficial to the child
  - What problem does it solve?
- Evidence based
  - Grounded in theory?
- How much treatment is necessary?

(Caruso & Strand, 1999; Yorkston & Beukelman, 2004)
Severity-Based Treatment

Level of severity and type of dysarthria influences the course and structure of intervention.

Remediation of mild to moderate dysarthria
- Compensatory strategies

Remediation of severe dysarthria
- Alternative form of communication necessary

(Caruso & Strand, 1999)
Treatment May Target:

- **Respiration:**
  - To obtain sufficient breath support for speech

- **Phonation:**
  - To reduce excessive Breathiness

- **Resonance:**
  - To reduce hypernasality

- **Articulation:**
  - To coordinate and strengthen the articulators

- **Prosody:**
  - To create phonetic contrasts in speech

- **Loudness:**
  - Feedback, Visi-pitch, delayed auditory feedback (DAF)

(Caruso & Strand, 1999)
Treatment Ideas

Promote the inclusion of:
- Family members and caregivers to increase generalization
- Alternative modes of communication
- Enhancement strategies (e.g., eye contact and facial expression)
- Repair strategies and self-monitoring
- Strategies to improve listener comprehension

Support the development of:
- Phonological awareness and literacy
- Receptive and expressive language
- Self-esteem

(Caruso & Strand, 1999)
Future Research

Childhood Dysarthria

- Prevalence: Currently unknown
  - Masked by primary diagnosis
  - Diagnosticians need to include assessment for dysarthria within the testing battery

- Intervention
  - Identification of effective treatment methods
  - Evidence-Based Practice


