

Management of Dysarthria in Acquired Brain Injury

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Overview

- Definitions & Descriptions
- Client Presentations
 - Stroke
 - Traumatic brain injury
- Discussion
 - Predicting recovery
 - Selecting treatment techniques
 - Dealing with associated problems

Dysarthria: Definition

A group of motor speech disorders characterized by weakness, slowness and/or incoordination of the speech musculature as the result of damage to the central or peripheral nervous system.

Acquired Brain Injury & Dysarthria

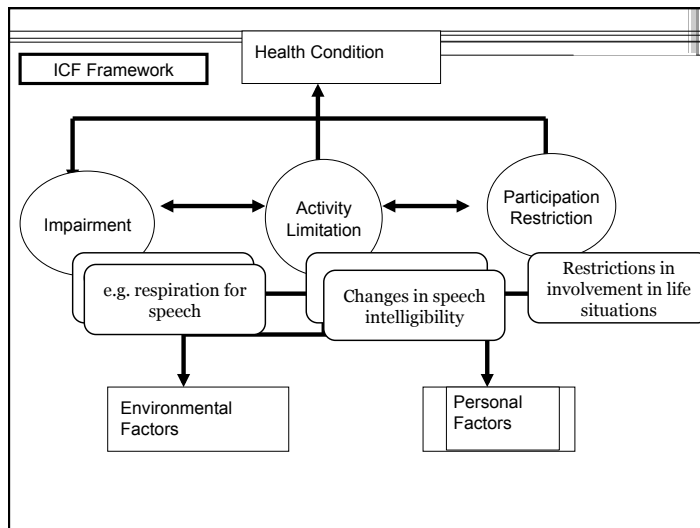
- Traumatic Brain Injury
 - Common Cause: MVC, Falls, Violence
 - Prevalence of Dysarthria
 - 65% Acute, 22% in OP Rehab (Yorkston et al, 1989)
 - Predicting recovery
 - 7 Clients studies of severe dysarthria & important changes occurring years post onset (Beukelman, Nordness & Yorkston, in press)

Acquired Brain Injury & Dysarthria

- Brainstem Stroke
 - Sudden onset of persistent, focal neurologic deficits
 - Prevalence of Dysarthria
 - 48% in IP Rehab (Teasell, 2002)
 - Recovery
 - 12 -25 % regained functional speech (Culp & Ladtkow, 1992; Soderholm et al, 2001)

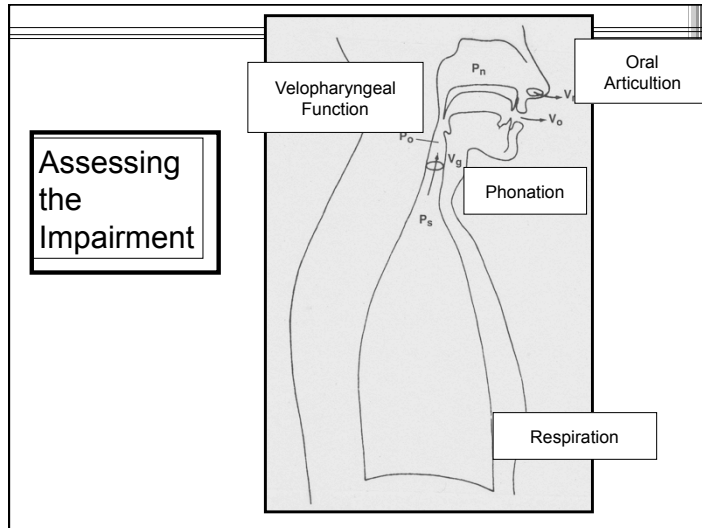
Current Trends

- WHO framework for Chronic Condition (International Classification of Function, Disability & Health – ICF)
- Evidence-Based Practice
- Staging of Intervention



Impairment (changes in structure & function of speech components)

- **Description:** Slow, weak imprecise &/or uncoordinated movements
- **Assessment:** Physiologic function of respiration, phonation, VP, and oral articulation
- **Goals of tx:** Restoration of function
- **Examples of Specific Techniques:**
 - **Strengthening weak respiratory muscles in flaccid dysarthria**
 - **Decrease overall muscle tone with proper positioning in cerebral palsy**



Activity Limitation (problems in execution of the task of speaking)

- **Description:** Speech is not typical
- **Assessment:** Speech intelligibility, rate and naturalness (Yorkston, Beukelman, Hakel & Dorsey, 2007)
- **Goals of tx:** Develop behavioral or prosthetic compensations
- **Examples of Specific Techniques:**
 - Speaking rate reduction
 - Modifying respiratory patterns to achieve adequate loudness

Restricted Participation (interference in life situations requiring communication)

- **Description:** Interference with involvement in communication situations
- **Assessment:** Self-reports (Donovan et al, 2007)
- **Goals of tx:** Development of effective interaction strategies
- **Examples of Specific Techniques:**
 - Conversational management, i.e. topic introduction
 - Partner training

Environment (physical, social and attitudinal surrounding)

- **Description:** The physical, social and attitudinal surrounding
- **Assessment:** Self report
- **Goals of tx:** Reduction in barriers
- **Examples of Specific Techniques:**
 - Reducing noise
 - Changing school district's policy
 - Change nursing home procedures related to social interaction

Evidence-Based Medicine (Practice)

... an approach to decision making in which the clinician uses the best evidence available, in consultation with the patient, to decide upon the option that suits that patient best.

(Muir Gray, 1997)

Evidence includes:

- Best Current Evidence
- Clinical Expertise
- Client Preferences & Values

Systematic Review in Dysarthria

- Sponsored by the Academy of Neurologic Communication Disorders & Sciences (ANCDS)
 - <http://www.ancds.org/>
- With generous financial support from
 - ASHA - SID 2
 - ASHA - VP for Clinical Practice in SLP
 - Department of Veterans Affairs

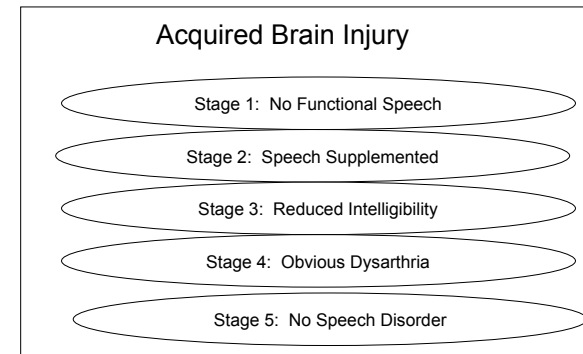
Phases of Development: ANCDS Systematic Reviews

- The Writing Committee
- Developing the Questions
- Searching the Literature
- Rating Evidence
- Report the Evidence
- The Panel of Expert Reviewers
- Dissemination of the Findings

Systematic Reviews in Dysarthria

- Management of Velopharyngeal Function
 - 33 studies (224 subjects)
- Behavioral Management of Respiratory / Phonatory Dysfunction
 - 35 studies (~283 subjects)
- Spasmodic Dysphonia (Medical Management)
 - 103 studies
- Speech Supplementation
 - 19 studies (~90 subjects)
- Treatment of Loudness, Rate & Prosody
 - 51 studies (308)

Staging of Intervention



When should treatment occur?

- Rationale for early intervention:
 - Communication is necessary for participation in rehabilitation
 - Procedural learning can occur while in the period of post-traumatic amnesia (McGhee et al, 2006)
- Rationale for long-term follow-up
 - Important changes can occur years post onset

Video Client 1

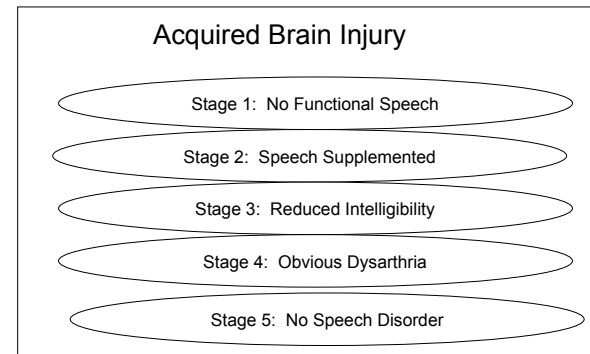
- 28 year old woman
- Acquired brain injury: Stroke (Basilar Artery Occlusion)
- 14 months post onset
- Severe velopharyngeal incompetence
- Poor hand function & severe mobility limitation
- Difficulty swallowing secretions

Client 1: Conversation

- What stage of recovery best described this woman?
- Briefly describe her dysarthria:
 - Phonatory quality
 - Respiratory support
 - Velopharyngeal function
 - Articulatory adequacy
- How would you describe her pragmatics?

Video D.5a

Staging of Intervention



Client 1: Conversation

- What stage of recovery best described this woman?
 - Stage 2 Natural speech supplemented by augmentative communication techniques
- Briefly describe her dysarthria:
 - Phonatory quality
 - Respiratory support
 - Velopharyngeal function
 - Articulatory adequacy
- How would you describe her pragmatics?

Client 1: Motor Speech Exam

- Why does this woman speak so slowly?
 - Lack of respiratory support
 - Velopharyngeal dysfunction
 - Compensatory strategy to help listeners
 - Weakness of tongue and lip
 - Learned behavior

Client 1: Physical Examination

- Given VP incompetency, what factors would you consider when deciding between:
 - Nasal Obturator
 - Palatal Lift
 - Doing Nothing?
- Given the severity of dysarthria and poor hand function, how might this woman supplement natural speech?

Client 1: Speech with and without Obturator

- Describe the quality of plosive consonants with and without the nasal obturator?

Video D5b

Client 1: Discussion Summary

- Selecting Tx approaches
 - What tx approaches did you use? (Demo 1)
 - How did you decide what to do first?
 - How can her natural speech be supplemented?
- Dealing with Associated Problems:
 - How are you dealing with lack of hand function?

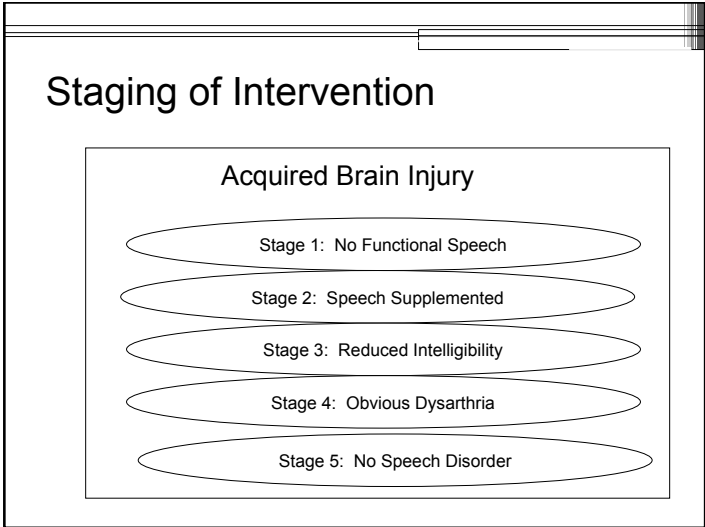
Video Client 2

- 26 year old male
- Traumatic Brain Injury
- 3 years post onset
- Wheelchair for mobility
- Decreased manual dexterity

Client 2: Conversation

- What stage of recovery best described this man?
- Briefly describe her dysarthria:
 - Phonatory quality
 - Articulatory adequacy
 - Velopharyngeal function
- How would you rate his pragmatics?

Video D.3a



Client 2: Conversation

- What stage of recovery best described this man?
 - Stage 2/3 Reduced Speech Intelligibility, needs AAC supplementation
- Briefly describe his dysarthria:
 - Phonatory quality
 - Respiratory support
 - Velopharyngeal function
 - Articulatory adequacy
- How would you describe his pragmatics?

Client 2: Physical Examination

- Given VP incompetency, what factors would you consider when deciding between:
 - Nasal Obturator
 - Palatal Lift
 - Doing Nothing?

Video D.3b

Client 2: Discussion Summary

- Selecting Tx approaches
 - What tx approaches did you use?
 - How did you decide what to do first?
- Dealing with Associated Problems:
 - How are you dealing with pragmatic issues?

Video Client 3

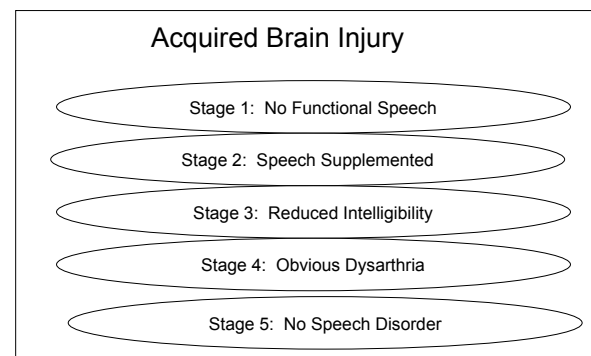
- 34 year old male
- Traumatic Brain Injury
- 8 years post onset
- Wheelchair for mobility
- Intact manual dexterity
- Very socially engaged
- Resides in supported independent living
- Volunteers

Client 4: Conversation

- What stage of recovery best described this man?
- Briefly describe her dysarthria:
 - Phonatory quality
 - Articulatory adequacy
 - Velopharyngeal function
- How would you rate his pragmatics?

Video D.1c

Staging of Intervention



Client 3: Conversation

- What stage of recovery best described this man?
 - Stage 3 Reduced Speech Intelligibility: AAC supplementation
- Briefly describe his dysarthria:
 - Phonatory quality
 - Respiratory support
 - Velopharyngeal function
 - Articulatory adequacy
- How would you describe his pragmatics?

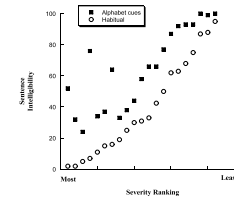
Client 3: Breakdowns in intelligibility

- What strategy would you recommend to resolve communication breakdowns?
- What factors would influence alphabet versus topic supplementation?

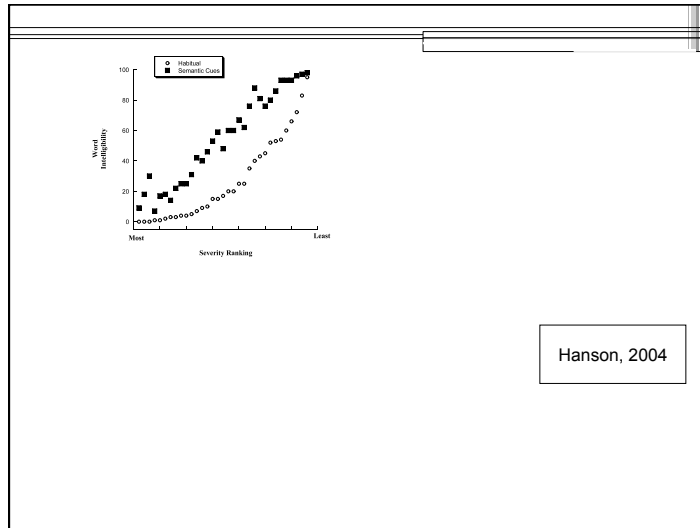
Video D.1d,e

Alphabet Supplementation

- Advantages
 - Can be used with any message
 - Useful in resolving communication breakdowns
 - Allows for early practice
 - Low cost
 - Minimal training
- Disadvantages
 - Slows speaking rate
 - May disrupt prosody
 - Listener needs to watch
 - Some literacy
 - Requires an alphabet board



Hanson, 2004



Hanson, 2004

Client 4: Discussion Summary

- Selecting Tx approaches
 - What tx approaches did you use?
 - How did you decide what to do first?
- Dealing with Associated Problems:
 - How are you dealing with pragmatic issues?

Video Client 5

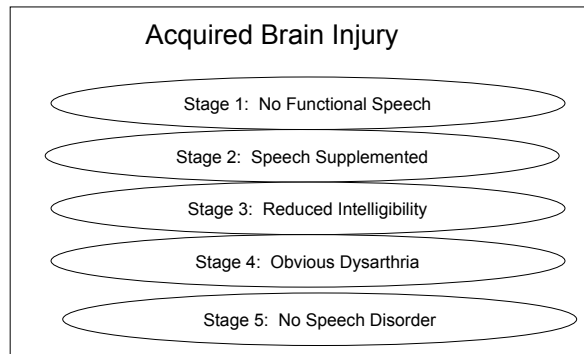
- 20 year old male
- Surgical removal of brainstem tumor at age 3 and recurrence at age 12
- 8 years post onset
- No physical limitations
- Lives independently, university student

Client 4: Conversation

- What stage of recovery best described this man?
- Briefly describe her dysarthria:
 - Phonatory quality
 - Articulatory adequacy
 - Velopharyngeal function
- How would you rate his pragmatics?

Video SK

Staging of Intervention



Client 5: Conversation

- What stage of recovery best described this man?
 - Stage 4 without palatal lift; stage 5 with palatal lift
- Briefly describe his dysarthria:
 - Phonatory quality
 - Respiratory support
 - Velopharyngeal function
 - Articulatory adequacy
- How would you describe his pragmatics?

Client 5: Decisions in velopharyngeal management

- How does severity of velopharyngeal impairment compare with that in other speech subsystems?
- During endoscopic view of velopharyngeal mechanism, what is the status of the velopharyngeal port?
- How is this opening altered by the palatal lift insertion?

Video D.6

Take Home Message

- Type & severity of dysarthria vary
- Dysarthria occurs within a context that must be considered:
 - Associated symptoms
 - Environmental factors
- After the acute stage:
 - Recovery is slow
 - Final end-point is unpredictable
 - Change may occur years post onset

Take Home Message

- Many treatment techniques are available
 - Use of multiple techniques is typical
 - Techniques vary with severity of dysarthria
 - Treatment techniques are often sequenced
 - With severe dysarthria, natural speech can be supplemented with AAC techniques

MSD Decision Making & Video Samples (DVD)

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AAC Decision - Making

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Prevalence & Prognosis

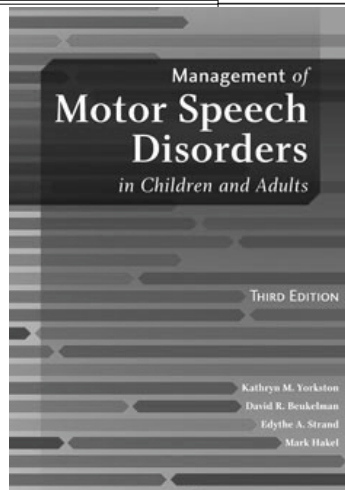
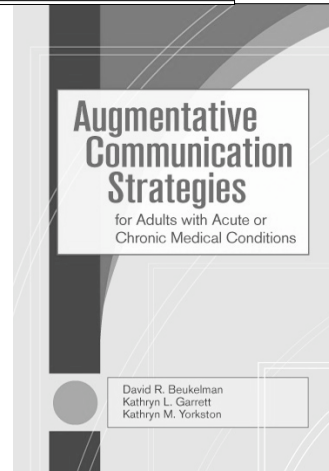
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Recent Specific Interventions

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Recent Specific Interventions

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