MANAGEMENT OF ADULT AOS AND DYSARTHRIA

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So, here’s a summary of how the experts are currently diagnosing/defining AOS….

NECESSARY for AOS Diagnosis
(McNeil et al., 2008; Wambaugh et al., 2006)

- Slowed rate of speech production
- Sound Errors
  - Distortions (predominant type)
  - Substitutions and distorted substitutions
  - Omissions, additions (intrusive schwa)
- Prosodic Abnormalities
  - Syllable segregation
  - Equalized stress

Example of pure AOS!

Treatment for AOS:
Summary of current thinking

- Go to ancds.org and look for Practice Guidelines

- Wambaugh, Duffy, McNeil, Robin, Rogers, 2006a,b
  - Review and evaluation of treatment evidence from 59 publications through 2003

- And more recently…

Apraxia Battery for Adults: Speech Inventory

BE WARY!
MOST features are shared with aphasia/dysarthria.
1. Articulatory Kinematic Treatments

- Helping articulators know where to go and when
- Most evidence
- Most techniques rely on some modeling/repetition to elicit productions of the desired speech behavior

Articulatory-Kinematic Treatments

- **Integral stimulation**
  - "Watch me, listen to me, say it with me"
  - Maximal support; gradually faded cues
  - Can manipulate timing of stimulus-response interaction

- **Prompts for Restructuring Oral Muscular Phonetic Targets (PROMPT; Hayden 2006)**
  - Cues provided to pt. through oral-facial prompts (provided by trained clinician)
  - Some efficacy with adults (more with children)

- **Sound Production Treatment** (SPT; Wambaugh et al.)
  - More research than any other aos tx!
  - Work on problematic consonants (at wd, phrase, sentence level)
  - Hierarchy includes modeling & repetition, letter cueing, integral stimulation, phonetic placement cueing and repeated practice
Example of a SPT hierarchy

1. Production of target phrase (or word) in minimal pair context (or alone) following a verbal model from the therapist
2. Repetition of Step 1 with provision of a written cue (i.e., printed letter representing the target sound)
3. Production of the target word only with integral stimulation (up to three attempts with integral stimulation were allowed)
4. Production of the target word only with articulatory placement cues and a model from the therapist
5. Production of the target sound in isolation with a model
6. Presentation of the next item

Stimuli examples (Wambaugh et al., 2004)
- The bash
- Oh gosh
- A push
- My leash
- Her cash
- A rush
- The bush
- Her wish
- With zeal
- Big zoo
- Not zany
- No zest
- Big zit
- The zone
- Big zero
- Don’t zip

http://www.youtube.com/watch?v=DdA1_PADaHw

Articulatory-Kinematic Treatments

- Biofeedback
  - Mostly feedback of tongue positioning
    - Electropalatography (see McAuliffe & Ward, 2006)
    - EMA (electromagnetic articulography)
  - Growing number of studies documenting improvement in speakers w/ AOS.

2. Rate and/or Rhythm Treatments

- Rationale: AOS is c/b disruptions in the timing of speech production; rhythm is an essential component of the speech process
- About 10 studies thus far
  - Metronome, computerized pacing

https://www.youtube.com/watch?v=dSLEv5IT5dA

Other general categories of AOS tx

3. Intersystemic Reorganization Txs
  - Use a relatively intact system/modality to facilitate functioning of an impaired system/modality.

4. AAC

Interesting Trends in AOS Research

- 4 of 12 articulatory-kinematic studies used visual biofeedback
- 3 EMA studies (Katz et al., 2002, 2007; McNeil et al., 2007)
- 1 spectrographic (voicing) (Ballard et al, 2007)
- Many are utilizing MOTOR LEARNING PRINCIPLES
On to Dysarthria….

• Here’s your little quiz.... 😊

Think SUBSYSTEMS

• Respiration
• Phonation
• Articulation
• Resonance
• Prosody

Are these systems weak / insufficient?

Are these systems poorly controlled?

Hierarchy of subsystem management

Tx of Respiratory-Phonatory Issues from WEAKNESS

RESPIRATION

• Biofeedback of chest wall movements or loudness levels
• Breathing against resistance

Tx of Respiratory-Phonatory Issues from WEAKNESS: EMST
Tx of Respiratory-Phonatory Issues from lack of COORDINATION/CONTROL

RESPIRATION
- Teach appropriate speech-breathing pattern; practice with stimuli of increasing length
- Instrumental feedback (e.g., Respirtrace) can be useful for this activity

Talk!

What respiratory approach would you likely take with these clients?

Then move to respiratory flexibility...

You wish to know all about my grandfather. * Well, he is nearly 93 years old, * yet he still thinks as swiftly as ever. * He dresses himself in an ancient, black frock coat, * usually minus several buttons.

Tx of Respiratory-Phonatory Issues: The latest on LSVT...

Great summary on research to date in:

Evidence-based treatment of voice and speech disorders in Parkinson disease

Leslie A. Mehta*, Lorraine O. Ramsey**, and Cynthia Fox*

<table>
<thead>
<tr>
<th>Primary Outcomes Variable</th>
<th>Data documenting treatment outcomes following LSVT LOUD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acoustic</td>
<td>Improved voice quality</td>
</tr>
<tr>
<td></td>
<td>Improvement in voice quality</td>
</tr>
<tr>
<td></td>
<td>Less harsh and breathy</td>
</tr>
<tr>
<td></td>
<td>Better voice quality</td>
</tr>
<tr>
<td></td>
<td>Improved speech intelligibility</td>
</tr>
<tr>
<td>Additional acoustic variables:</td>
<td>Improved rate, slower</td>
</tr>
<tr>
<td></td>
<td>Improved F0 variation (Pitch); Reduced breathiness</td>
</tr>
<tr>
<td></td>
<td>Improved articulation:</td>
</tr>
<tr>
<td></td>
<td>Larger vocal space area</td>
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<td></td>
<td>Improved formant centralization ratio</td>
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<tr>
<td></td>
<td>Improved articulatory acoustics</td>
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<tr>
<td></td>
<td>Reduced breathiness</td>
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<td></td>
<td>Improved voice and speech</td>
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<tr>
<td></td>
<td>Improved quality</td>
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<td></td>
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<tr>
<td></td>
<td>Improved communication characteristics</td>
</tr>
</tbody>
</table>

Perceptual:
- Improved voice quality
- Reduced breathiness
- Improved voice and speech
- Improved quality
- Improved intelligibility
- Improved communication characteristics

Physiologic:
- Improved vocal fold adduction with no increase in laryngeal inflation
- Direct visualization
- Electroglottography
- More efficient analysis
- Improvement in maximum capacity tongue function

References:
Facial expression: Improved frequency and variation of expressions

Neural: Activation pattern changes in cortex and subcortical areas and right-sided shift in activation

Treatment Accessibility
Primary outcome variable: Data supporting alternate modes of treatment

Increased v/as SPL: Telepractice (LSVT eGOD™)
LSVT Companion Software
Alternate treatment dosage (LSVT-X)

- (60) Howie, Tripoli, Pirig, 2006; (61) Theodoro, Ramiq, 2001

8 wks = 4 wks

Please don’t put all of your eggs in the LSVT basket. Sometimes amplification is a good option!

Speech Enhancer

ChatterVox

Not much new in management of velopharyngeal impairment

- For more mild impairments:
  - Modifying pattern of speaking (e.g., slow rate, overarticulate)
  - Resistance treatment during speech
- Continuous Positive Airway Pressure (CPAP)


Prosthetic management still considered standard for more severe VP issues

- Palatal lift
- Nasal obturator

Video: 20 y/o man; surgical removal of brainstem tumor at age 3: With and without lift

Feedback to nasal airflow & hypernasality
- From mirror, See-Scape
- Biofeedback, e.g., nasometry

http://www.kayelemetrics.com/
On to…Rate, Articulation and Prosody

“Rigid” Rate Control Techniques
- One-word-at-a-time-style; more severe clients
  - Hand/finger tapping
- Pacing boards
  - Alphabet board supplementation
  - Metronome

Rate Control Techniques that Preserve Prosody
- Computerized feedback to increase duration of utterance.

Rate Control Techniques that Preserve Prosody
- Rhythmic Cueing
  - Clinician points to words in a printed passage in a rhythmic fashion
  - Computerized pacing (e.g., Speech Pacesetter app!)

For Artic Issues
IOPI (Iowa Oral Performance Instrument)
- Objectively measures tongue and lip strength
- Can measure endurance
- Can be used for tx in select cases…

Behavioral Articulation Treatment
Strengthening (“oral motor”) exercises?
Still controversial
Before doing any nonspeech oral motor exercises, read this article first!


• Some take home messages from Clark, 2003:
  • Difference between strength, power and endurance
  • Improvements come from overload
  • Effects highly specific to trained behavior
  • **Best candidates?** Non-progressive flaccid dysarthria
  • **Not appropriate for?** Those with poor recovery from fatigue

Behavioral Articulation Treatment

• Biofeedback
  • Some success with EMG feedback of lip and jaw movement
  • More recent success with electropalatography (EPG)
  • Gives feedback RE timing and location of tongue’s contact with hard palate during speech

No research, but might still consider

• **Contrastive production drills**
  • Speaker asked to make 2 sounds as different as possible. E.g., /pick/ and /pit/

• **Intelligibility drills**
  • Production of small sets of words that are similar except for one phoneme (consonant or vowel)
  • Each word is printed on a card, cards shuffled
  • Clinician naive to word being produced by client; attempts to identify the word being produced
  • Can advance to phrases, sentences, pictures to describe, etc.

Treatment of Prosodic Deficits

• **Contrastive stress tasks**
  • John loves Mary. Does John hate Mary? John LOVES Mary.

• **Referential tasks**
  • Client reads phrases/sentences with stressed targets that are unknown to the clinician

  **Feedback** of pitch, loudness, duration can be helpful (e.g., Visi-Pitch program)

And last, but certainly not least…

• Supported Communication
  • Speaker Strategies
  • Partner Strategies
  • Supplements such as alphabet boards if needed….
Some Speaker Strategies

• Get partner’s attention
• Set the topic; don’t shift topic abruptly
• Use grammar to enhance message
• Use gestures
• Use turn maintenance signals
• Discuss important topics when energy level at highest
• Choose a conducive environment

Some Partner Strategies

• DO NOT PRETEND THAT YOU UNDERSTAND!
• Pay attention to the speaker
• Avoid communication over long distances
• Maintain topic identity; piece together clues
• Allow adequate processing/speaking time
• Check hearing

Decide on strategies for resolving communication breakdowns…

• Needs to be negotiated ahead of time:
  • Guessing?
  • Finishing sentences?
  • Speaking for?
  • Shadowing?

Ways to Manage Communication Breakdowns

• Speaker:
  • Ask if listener is understanding
  • Repeat message; if repetition fails, rephrase the message
  • Use writing, finger/verbal spelling, alphabet board, etc.
• Listener:
  • Signal as soon as misunderstanding occurs
  • If repetition/rephrase fails, listener should communicate exactly what was understood before the speaker tries to communicate again in any modality
  • Can try “shadowing” and periodically summarizing

Supplementing Natural Speech

• Alphabet supplementation
• Topic supplementation
• Gestures

Alphabet boards
Figure 2: Sentence intelligibility without cues (habitual) and with alphabet cues for 21 speakers with dysarthria ranked by habitual intelligibility.

Alphabet board w/ topics

<table>
<thead>
<tr>
<th>Small Talk</th>
<th>Sports</th>
<th>Shopping</th>
<th>Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td>Food</td>
<td>Church</td>
<td>Computers</td>
</tr>
<tr>
<td>Personal Care</td>
<td>A B C D E F</td>
<td>G H I J K L</td>
<td>M N O P Q R</td>
</tr>
<tr>
<td>Transportation</td>
<td>S T U V W X</td>
<td>Y Z</td>
<td></td>
</tr>
<tr>
<td>Trips</td>
<td>I will spell the word.</td>
<td>Yes.</td>
<td>I don't know.</td>
</tr>
<tr>
<td>Appointments</td>
<td>I will point to the letter as I say the word.</td>
<td>Yes,</td>
<td>Forget it.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maybe.</td>
<td>I have something to say.</td>
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<td></td>
<td></td>
<td>Please repeat each word I say, so I know you understand.</td>
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<tr>
<td></td>
<td></td>
<td>You misunderstood.</td>
<td></td>
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<td></td>
<td></td>
<td>Start over.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>This is important!</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Wait a minute!</td>
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</tbody>
</table>