SPEECH (AND VOICE) REHABILITATION

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• The larynx - Sound produced is an index of physical, mental and emotional health; cultural heritage; and personality. Also serves to protect airway during swallow.

• The speech articulators – tongue, lips, jaw, soft palate – responsible for (physiological) facial symmetry for facial expression, well-articulated speech, and oral phase of swallow.
Pathology – vascular, traumatic, infectious, neoplastic, metabolic

- Dysarthria/anarthria – inability to utter distinctly secondary to slow, weak, imprecise, and/or uncoordinated movement of speech musculature
  - Dysphonia/aphonia – specific laryngeal
- Apraxia/dyspraxia – “without motor planning”
- Dysphagia – impaired swallow
Considerations

• Lesion site
  – CNS
    • Spasticity - UMN
    • Movement disorder (e.g. chorea, tremor, ataxia)
  – PNS
    • Flaccidity - LMN

• Disease Course
  – Static
  – Static and recovering
  – Progressive/degenerative
  – Recurring and remitting
Treatment

• Difficult – automatic behavior must be brought under volitional control, retrained, and practiced sufficiently to become automatic once again

• Must be individualized and specific
  – Consider client’s lifestyle
  – Reasonable goals
  – Measureable goals (i.e. sustaining 5 cm H2O displacement for 5 s. not important to patient, but it is measurable and will increase subglottal P for speech)
Flaccid (bulbar)dysarthria

• Denervation (LMN): loss of volitional control and reflexes - fasciculations, fibrillations, hypotonicity & hyporeflexia

• Etiologies: trauma, CVA, Guillain-Barre, Bell’s Palsy, Moebius Syndrome, Myasthenia Gravis, Muscular Dystrophy, ALS

• Speech characteristics
  – Shallow respiration; audible inspiration
  – Labored, imprecise articulation
  – Hypernasality & nasal emission
    • Voice - breathy
Flaccid Treatment

• Increase subglottal P – peak flow, breathing exercises, postural adjustments
• Oral motor weakness – exercises (jury still out on improved speech translation)
• Artic drills for “better” production
• Prosthetic management of weak velum
• Voice
  – Adduction exercises if BP/HR permit (medialization or anastomosis if severe)
  – Pitch and intensity glides
Spastic ( pseudobulbar ) dysarthria

• Loss of volitional control ( UMN ), but intact reflexes result in hypertonicity and hyperreflexia ( e.g. Babinski )
• Etiologies: trauma, CVA, ALS, CP
• Speech characteristics
  – Reduced control of exhalation, paradoxical breathing
  – Slow rate
  – Imprecise consonants
    • Voice – strain-strangled, monopitch, monoloudness
Spastic Treatment

• Rate reduction, but difficult to train
• Breathing exercises for relaxation and control, peak flow meter
• Artic drills for “better” production
• Voice – largely refractory to behavioral therapy. Most efficacious management will be medical (Botox, baclofen, etc.) to reduce tone and reflexes
Basal Ganglia Disorders

• Movement disorders – lack of refinement of pyramidal tract initiated voluntary movement
  – hypokinesia - reduced associated movement
  – hyperkinesia – excessive associated movement

• Often problem with tone
Hypokinetic dysarthria

• Bradykinesia/akinesia, rest tremor, reduced ROM, rigid tone
• Etiologies: PD or Parkinsonism, CVA, Trauma (Boxer’s Brain), neuroleptic medications
• Speech characteristics
  – Shallow inspiration; sudden forced exhalation
  – Variable articulator imprecision, inappropriate pausing, and reduced stress
    • Voice – breathy, harsh, reduced intensity
Hypokinesis Treatment

• Postural adjustments to increase subglottal $P$, peak flow meter, breathing exercises
• Oral motor exercises to prevent/reduce masked facies (akinesia) (Soloman, et al.)
• Voice – increased intensity – improves speech intelligibility and swallow (Ramig, et al.), glottal adduction exercises, pitch and loudness glides, amplification as necessary
Hyperkinetic dysarthria

• Quick (chorea) and slow (athetosis) forms
• Chorea, myoclonous, ballismus, dystonia, variable tone
  (dystonia late in HD), slow extraneous movements;
  tone variable
• Etiologies: HD, Tourette’s, infectious, familial tremor,
  drug-induced – Tardive dyskinesia, CVA, trauma
• Speech characteristics
  – Shallow, rapid breaths with interruptions
  – Articulatory imprecision, inappropriate silences
    • Voice – arrests, monopitch and monoloudness varying to erratic
      pitch and loudness variations; vocal harshness; tremor
Hyperkinesis Treatment

• Breathing exercises and peak flow meter
• Oral motor exercises – maintain control for swallow and speech
• Voice – pitch and loudness glides, breathy onset phonation or adduction exercises and patient’s presentation demands
• Work with PT on posture, especially later
• Work with dietician on diet in progressive cases – HD
• Cognitive therapy as necessary
Cerebellar disorder - Ataxic dysarthria

• Dysmetria, dysrhythmia, broad-based gait, nystagmus, intention tremor, possibly hypotonia
• Etiologies: MS, Familial ataxia, trauma, neoplasm, CVA, hypothyroidism, multiple systems atrophy
• Speech characteristics:
  – Irregular respiration, reduced control
  – Variably imprecise articulation with frequent omission and distortions (drunken sounding)
  – Slow, irregular DDKs
    • Voice – loudness and pitch outbursts (explosive stress), harsh quality
Ataxia Treatment

• Sleep study
• Peak flow and breathing exercises if warranted
• Artic drills for coordination
• Oral motor exercises for coordination
• Voice – pitch and loudness drills; mix breathy onset phonation and glottal adduction exercises
• Work with PT