Dysarthria: Diagnostic and Therapeutic Approaches

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**Definition**

**Motor speech disorders**: disorders of speech resulting from neurologic impairment affecting the motor programming or neuromuscular execution of speech (Duffy, 1995)

- **Impairments of Planning/Programming**: coordination of relevant muscles and muscle groups is disrupted (muscle physiology and movement is intact)
- **Impairments of Execution**: disruptions in muscle physiology – affected by involuntary movements and reductions in movement abilities (whether speech is programmed normally or not)

**Definition**

**Apraxia of Speech**: Neurogenic speech disorder resulting from impairment of the capacity to program sensorimotor commands for the positioning and movement of muscles for the volitional production of speech.

It can occur without significant weakness or neuromuscular slowness, and in the absence of disturbances of conscious thought or language.
Dysarthria is a speech disorder resulting from disturbances in muscular control over the speech mechanism due to damage of central or peripheral nervous system. Problems in oral communication due to paralysis, weakness, or incoordination of speech musculature.

The neurological deficit in dysarthria may lead to breakdown in the motor control of the whole speech system including respiration, phonation, resonance and articulation.

Classification of Dysarthria

(1) Variables relevant to neurologic and etiologic dimensions:
- Age of onset
- Course
- Site of lesion
- Neurological diagnosis
- Pathophysiology

(2) Variables relevant to speech disorder themselves:
Speech component involved
Severity
Perceptual characteristics
**Perceptual Types of Dysarthria**

- Flaccid dysarthria
- Spastic dysarthria
- Ataxic dysarthria
- Hypokinetic dysarthria
- Hyperkinetic dysarthria
- UUMN dysarthria
- Mixed dysarthria

### Flaccid Dysarthria

The lower motor neurons (LMN) of the cranial or spinal nerves (FCP)

Its characteristics reflect the combined effect of weakness and reduced muscle tone on the speed, range and accuracy of speech movements

- Physical Trauma
- Vascular disorders
- Neuromuscular junction disease *Myasthenia Gravis*
- Demyelinating disease (Guillain-Barre Syndrome)
- Degenerative diseases (motor neuron disease)
Clusters of Deviant Speech Dimensions

**Phonatory incompetence**: breathy voice, audible inspiration and short phrases

**Resonatory incompetence**: hypernasality, nasal emission, weak pressure consonants and shortened phrases

**Phonatory incompetence**: harsh voice, monopitch and monoloudness

**Clinical picture of nerves affected**

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Specific cranial nerves lesion

**Trigeminal (V)**: Bilateral lesion has devastating impact on articulation. bilabial, labiodental, linguadental, and lingua-alveolar articulation as well as lip and tongue adjustment for many vowels

**Facial VII**: Distortion of bilabial, labiodental consonants, weak plosives dt decrease IOP dt lip weakness & leak. Vowel distortston dt lip rounding. Poorer "puhs" than "tuhs" or "kuhs"

**Gloospharyngeal & Vagus IX & X**: pharyngeal branch: hypernaslity

- Ext Sup LN: short, bowed VF
- RLN: fixed VF

**XI accessory**: Shoulder weakness, posture affect resp, phon.

**Hypoglossal XII**: Affect tongue elevation as alveolar, velar and vowel sounds.
Spastic Dysarthria

*Bilateral UMN damages of including direct and indirect activation pathway of the CNS*

**Direct:** loss of skilled movements

**Indirect:** hypertonia, spasticity, hyperactive reflexes

- Bilateral cerebrovascular accident
- Degenerative process as (ALS)
- Multiple Sclerosis (MS)
- Traumatic Brain Injury (TBI)
- Neoplasm, congenital, toxic and metabolic disorders.

Clusters of Deviant Speech Dimensions

- **Prosodic excess cluster:** excess and equal stress and slow rate of speech (slow skilled movements)
- **Articulatory-resonatory incompetence:** imprecise consonants, distorted vowels and hypernasality (not sever as FD, no nasal emission)
- **Prosodic insufficiency:** Consisting of monopitch, monoloudness, reduced stress and short phrases
- **Phonatory stenosis:** low pitch, harshness, strained voice, pitch breaks, short phrases. (spasticity of laryngeal ms)
**Spastic vs Flaccid Dysarthria**

<table>
<thead>
<tr>
<th>Spastic</th>
<th>Flaccid</th>
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</thead>
<tbody>
<tr>
<td>Bilateral UMN lesion</td>
<td>LMN lesion</td>
</tr>
<tr>
<td>Hypernasality</td>
<td>+ Emission</td>
</tr>
<tr>
<td>Tight, harsh or strained voice</td>
<td>Breathy voice</td>
</tr>
<tr>
<td>Pseudobulbar affect &amp; drooling</td>
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</tr>
</tbody>
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**Ataxic Dysarthria**

*Damage to the cerebellar control circuit*

*Coordinated skilled voluntary ms activity and tone*

3 bundles:

- **Inferior cerebellar peduncle:** receive sensory information from entire body position for timing, force of movements
- **Middle cerebellar peduncle:** receive information from cortex regard planned movements.
- **Superior cerebellar peduncle:** output to motor area regard processed motor impulse.

1. **Degenerative Diseases**
   - Autosomal dominant cerebellar ataxia
   - Friedreich’s ataxia: spino-cerebellar deg

2. **Stroke-Vascular Disorders**
3. **Toxic and Metabolic Conditions** alcohol, mercury
4. **Traumatic head injury** peduncles torsion
5. **Tumors**
Clusters of Deviant Speech Dimensions

- **C/o:** slurred speech or sound like drunk
- **Articulatory inaccuracy:** imprecise consonants, irregular articulatory breakdowns and distorted vowels (disturbance in timing, range, force and direction of movements)
- **Prosodic excess:** excess and equal stress, prolonged phonemes, prolonged intervals and slow speech rate (slowness of repetitive movements)
- **Phonatory-Prosodic Insufficiency:** harshness, monopitch and monoloudness. (hypotonia)
- **Respiration:** Uncoordinated movements in the respiratory muscles

Hypokinetic Dysarthria

refined neural impulses for planned movements

regulate muscle tone and movements that support goal-directed movements.

planned upcoming movements

The BG smooth and refine these planned movements
**Parkinsonism**

- Resting tremors
- *Bradykinesia*
- *Muscular rigidity*
- *Akinesia*
- Postural abnormality

1- Idiopathic Parkinson’s Disease  
2- Neuroleptic-Induced Parkinsonism  
3- Postencephalitic Parkinsonism  
4- Traumatic Head Injury  
5- Cerebral anoxia  
6- Toxic Metal Poisoning  
7- Stroke

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**Clusters of Deviant Speech Dimensions**

- the effects of rigidity, reduced force, and range of movement, and slow individual but sometimes fast repetitive movements on speech.

- **Prosodic insufficiency**: Monopitch, loudness, reduced stress, short phrase, variable rate, inappropriate silences, short rushes of speech.

- **Articulation**: Imprecise consonants, Repeated phonemes (palilalia)

- **Phonation**: Harsh, breathy, or tremulous voice

- **Respiration**: Faster breathing rates with paradoxical movements
Hyperkinetic Dysarthria

Products of involuntary movements that interfere with speech. It gives impression that normal speech is being executed but interfered by abnormal involuntary movements that distort, slow or interrupt it.

A. Quick

- Hyperkinetic dysarthria of chorea
- Hyperkinetic dysarthria of myoclonus
- Hyperkinetic dysarthria of tics disorders

B. Slow

- Hyperkinetic dysarthria of athetosis
- Hyperkinetic dysarthria of dystonia

Hyperkinetic Dysarthria of Chorea

- **Choreiform movements** rapid, involuntary, random, purposeless movements of a body part.

- **Cluster of prosodic excess:** prolonged intervals, excess and equal stress, Variable rate of speech the most affected component of speech

- **Prosodic insufficiency:** monopitch, monoloudness, reduced stress. Inappropriate silences

- **Articulation** Imprecise consonants and distorted vowels choreic movements being imposed on the voluntary movements for articulation

- **Phonation:** harsh vocal quality, excess loudness variations, strained-strangled vocal quality, and voice stoppage (Intermittent, involuntary hyper or hypo-adduction of VF)
**Palatopharygolaryngeal Myoclonus**

involuntary abrupt rhythmic or semi-rhythmic unilateral or bilateral movement of palatal, pharyngeal and laryngeal muscles.

- **Phonation-respiration:** May be momentary voice arrests (myoclonic beat)
- **Resonance:** Intermittent hypernasality
- **Articulation/prosody:** Brief silent intervals
- **Physical:** Myoclonic movements of palate, pharynx, and larynx
- **Laryngeal/pharyngeal myoclonus** sometimes observable beneath neck surface

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**Gilles de la Tourette Syndrome**

- Multiple motor and vocal tics,
- before the age 14
- Slow appearance and disappearance of symptom
- Tic behaviors that change and evolve over time.

- Vocal tics: throat clearing, grunts, or barking.

- ADHD, learning disability, phobias and other behavioral and psychiatric disorders.
Hyperkinetic Dysarthria of Dystonia

- Involuntary, prolonged muscle contractions that interfere with normal movement or posture

- **Cluster of articulatory inaccuracy:** Imprecise consonants, distorted vowels, irregular articulatory breakdowns, and prolonged phonemes. (sustained dystonic contractions of the oral musculature causing errors in the positioning of the articulators)

- **Prosody:** Monopitch, loudness, inappropriate silences, short phrases, and reduced stress dystonic muscular contractions that reduce range and speed of movements

- **Cluster of phonatory stenosis:** Harsh voice quality, strained-strangled quality, excessive loudness variation, and voice stoppages

Unilateral Upper Motor Neuron Dysarthria (UUMN)

- Unilateral damage to the upper motor neurons that carry impulses to the cranial and spinal nerves.

- May co-occur with other disorders (e.g., aphasia, apraxia, aprosodia), limb hemiparesis, visual deficits, and/or cognitive impairments
Etiologies of UUMN

Most cranial nerves serving the speech muscles receive bilateral innervation from the UMN.
The cranial nerves serving the lips and tongue are innervated primarily by UMN from contralateral side of the brain.
Unilateral UMN lesion resulting in movements of the tongue being slow with a reduced ROM and the tongue will also deviate to the affected side when protruded.
Patient may complaint their tongue feeling slow and clumsy.
A hemi-lower facial droop.

1. Stroke
   - Pure motor hemiparesis
   - Ataxic hemiparesis
   - Dysarthria clumsy hand syndrome
   - Pure dysarthria (isolated dysarthria)

2. Tumors
3. TBI

Clusters of Deviant Speech Dimensions

Reflect the effects of weakness, and incoordination, on speech.

Articulation: UUMN dysarthria is primarily a disorder of articulation (98%) with imprecise consonant production, irregular articulatory breakdown and irregular AMRs

Phonation: Mild harsh vocal quality

Resonance: Very mild hypernasality
Mixed Dysarthria

Etiologies of Mixed Dysarthria:

- Motor Neuron Diseases
- Single or multiple strokes
- Brain tumors
- Traumatic brain injury
- Degenerative diseases
- Infectious diseases

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
<th>Neurologic Location</th>
<th>Neuro muscular Deficit</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Flaccid</td>
<td>Hypernasal, breathy voice quality, imprecise articulation</td>
<td>Lower motor neurons</td>
<td>Weakness, hypotonia, fasciculations</td>
<td>Bulbar palsy, polyneuropathy, myasthenia gravis</td>
</tr>
<tr>
<td>2- Spastic</td>
<td>Strained/thin, strained voice quality, hypernasal, slow rate, monotony</td>
<td>Upper motor neurons</td>
<td>Hypotonia, weakness, reduced range and speed of movement</td>
<td>Pseudobulbar palsy, stroke, ataxia, spastic, cerebral palsy</td>
</tr>
<tr>
<td>3- Ataxic</td>
<td>Excess and equal stress, slow rate</td>
<td>Cerebellum</td>
<td>Hypotonia, slow and inaccurate movement</td>
<td>Stroke, tumor, alcohol abuse, infection</td>
</tr>
<tr>
<td>4- Hypokinetic</td>
<td>Hyperkinetic</td>
<td>Extrapyramidal</td>
<td>Rigidity, reduced range and speed of movement</td>
<td>Parkinson disease, drug induced</td>
</tr>
<tr>
<td>5- Hypokinetic</td>
<td>Slow</td>
<td>Extrapyramidal</td>
<td>Sustained, distorted, slow movements</td>
<td>Athetosis, dyskinesia</td>
</tr>
<tr>
<td>6- Unilateral UMN</td>
<td></td>
<td>Extrapyramidal</td>
<td>Involuntary, purposeless movements</td>
<td>Organic voice tumor</td>
</tr>
<tr>
<td>7- Mixed</td>
<td>Hypernasal, breathy voice quality, hypernasal, reduced strain, slow rate, incoordinate</td>
<td>Variable, upper and lower motor neurons, ataxia, extrapyramidal</td>
<td>Variable weakness, slow movement, limited range of motion, intentional tremor, rigidity, spasticity</td>
<td>Amyotrophic lateral sclerosis, Wilson disease, multiple sclerosis</td>
</tr>
</tbody>
</table>
Apraxia of Speech (AOS)

- Apraxia of Speech
  - Other terms
    - Speech apraxia
    - verbal apraxia
    - Broca's aphasia
  - A disturbance in the programming of movements for speech
    - muscles are capable of normal functioning
    - appropriate message has been formulated
    - Inability to transform an intact linguistic representation into coordinated movements of the articulators
    - "Difficult to enact the planned message"
  - related primarily to left hemisphere damage
  - may be accompanied by limb apraxia
  - most often associated with stroke
  - "pure" AOS is extremely rare

Apraxia of Speech (AOS)

- Patient perceptions and complaints: "Doesn't come out right"
  - articulation most often cited; stutter-like
- Nonspeech:
  - right-sided weakness secondary to UMN
  - may have oral nonverbal apraxia (obvious or subtle)
- Characteristics: slow speech, sound distortions,, reduced prosody,, difficulties initiating speech, groping of articulators
- Speech:
  - sound and prosodic errors
  - perceived substitutions, but usually distortions, consistent errors within an utterance
  - prolonged durations of sounds
  - greater errors with increased complexity, volitionality.
  - difficulty with repetition
  - groping behaviors
  - awareness of errors
  - severe AOS will be manifest in all forms of speech, and usually oral nonspeech movements
Childhood AOS

- Salient characteristics of this disorder is the same as acquired AOS
- Considerable delay in speech production, limited sound inventory, unintelligibility, and progress slowly in speech therapy
- Causes are not well understood; some research points to hereditary component, not clear there is specific neurological damage
- Some cases caused by stroke or traumatic brain injury
The primary goal of management is to maximize the effectiveness, efficiency, and naturalness of communication.

The key words that represent these directions are:

- **Restore lost function**: this effort attempt to reduce impairment. Full restoration of normal speech is no a realistic treatment goal; however some degree of recovery occurs.

- **Promote the use of residual function (compensate)**: teach compensatory techniques for functions not restored. Eg. modification of rate and prosody; prosthetic devices to amplify voice or the use of AAC alternative mean of communication as alphabet board or computer based system.

- **Reduce the need for lost function (adjust)**: including planning for progressive loss of speech. For those who earn their living by speaking (teacher, salesperson, and lawyer) a dysarthria mean end of career. For other, it may require a reorganization of their work environment.

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**Management Goals**

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**Focus Of Treatment**

The component that will be of the greatest and the quickest functional benefit or that will provide the greatest support for improvement in other aspects of speech.

- Treatment focuses on (re)learning motor aspects of speech production, which requires acquisition, retention, and generalization
  - Acquisition: temporary improvements during treatment
  - Retention: lasting performance enhancements
  - Generalization: improvements in either related but untrained behaviors (*response*) or in targeted behaviors in different contexts, tasks, or settings (*stimulus*)
Hierarchy of subsystem treatments

1st order Resonation Respiration
2nd order Phonation
3rd order Articulation Prosody

Duration Of Treatment

The treatment should be provided for as long as it is necessary to accomplish its goals but for as short a time as possible.

Duration will depend on: Etiology, predicted course of recovery and severity of deficits, specific goals and techniques of management, patient’s motivation and needs, duration of hospitalization, patient access to treatment and health care coverage.
Approaches To Management

- **Behavioral Management**
  - Improving physiologic support for speech
  - Compensatory speaking strategies
  - Developing augmentative means of communication
  - Controlling the environment and communicative interactions
- **Prosthetic Management**
- **Medical Management**

Principles and Guidelines for Behavioral Management

- Begin early
- Take baseline data to establish goals and measuring change
- Increase physiologic support (often the initial focus of treatment)
- Help patient to be able to self-monitor
- Implement principles of motor learning
  - Use speech to improve speech
  - Drill is essential
  - Instruction improves performance
  - Self-learning is valuable
  - Feedback is essential to motor learning - Clinician-provided feedback
    - Instrumental feedback or biofeedback
  - Specificity of training
Articulation

- **Strengthening Exercises**
  Strengthening exercises should be used only after establishing that weakness of the oral articulators is clearly related to the dysarthria. Patients whose physiologic support for speech is severely compromised might benefit from efforts to increase strength.

- **Principles for standard muscle strengthening**
  - Need to do 5 sets of 10 repetitions each, three to five times per session, with 5 to 10 exercise periods per day.
  - Exercises need to overload the muscle in some way (e.g., high repetition-low resistance or low repetition-high resistance).
  - The first few minutes of a session to increase attention to the face, increase awareness of movement, etc. is good, but spending much of the session on non-speech movement is not generally the best use of time.
  - the patient can be given oral motor exercise homework to work on independently if appropriate.
  - The predicted results are increased stability, speed, range, strength and accuracy of movement of oral muscle groups in articulation.
Articulation

- **Relaxation exercises:** Improve muscle tone in patients with spasticity or rigidity, e.g., shaking the head and the open jaw, chewing movement to promote tongue and jaw relaxation.

- **Stretching exercises: active or passive**
  - Tongue stretching: Clinician holds the tongue tip with a gauze pad, pulls straightforward, pulls to the left or right and holds each position for 10 seconds.
  - Lips stretching: Clinician carefully pulls lips out and away from the face and holds for 10 seconds.
  - Jaw stretching: Recommended to lessen rigidity in the jaw muscles. Patient holds maximum opening with and without physical assistance and holds jaw lateralized to the right and left with and without physical assistance.
  - For some clinical populations, it is more important to conserve energy for speech than work on strengthening exercises.
  - Strengthening exercises are contra-indicated for many progressive neurological disorders, such as ALS.

Articulation

- **Traditional Articulation Treatment**
  - **Integral stimulation**
    - **Watch and listen imitation tasks.**
  - **Phonetic placement**
    - Increase awareness of how sounds are produced by using hand on assistance in attaining target and movement, pictured illustration of articulatory target and the like.
  - **Phonetic derivation**
    - Using the intact non-speech gestures to establish a target such as blowing to facilitate the production of /u/.
  - **Intelligibility drills**
    - Patient is given a list of words to say or a picture to describe with the clinician turned away so that they can only judge the word based on its acoustic signal. It focuses on the primary goal of treatment that is improved intelligibility which can be adjusted to ensure success.
Articulation

**Traditional Articulation Treatment**

- **Exaggerating consonants (over-articulation)** to prevent slighting and improve precision, especially in the final position of syllables. Articulatory drill should emphasize movements and syllables and not aiming fixed position.
- **Minimal contrast drills**: Client produces word pairs, in which there needs to be a distinction (e.g., sea-she & pay-may & stop-top).
- **Compensatory articulatory movements**: as using linguo-dental contact instead of bilabial closure when lip weakness or hypertonicity is significant.
- A careful inventory of articulatory errors that contribute to decreased intelligibility is important to the ordering of stimuli in treatment. In general stops and nasals are easier than fricatives and affricatives, especially when respiratory support is decreased. When the palate is weak, nasals, vowels and glides are generally easier than consonants requiring intraoral pressure.

Resonance

**I. Behavioral Management**

- Decreasing speaking rate, change level of effort
- Monitoring nasal airflow and resonance features
- Increasing precision of speech by exaggerating movements
- Speaking with a greater open mouth posture
- Resistance training CPAP

**II. Prosthetic intervention**

- Palatal Lifts prosthesis

**III. Surgical intervention**
Resonance

**Behavioral Management**: eg

- Encouraging the client to imitate yawn may facilitate elevation of the palate.
- Asking the client to produce a series of /a/ sounds, encourage a definite “attack” on phonation to facilitate the elevation.
- Introducing the repetition of a series of plosives and open vowel sounds (e.g. /pa: pa: pa & da: da: da/).
- Proceed to fricatives (e.g. /si: si: si/).
- Repeat a series of nasal and voiced plosives and vowel sounds (e.g. /mba: mba: mba & nda: nda: nda/).
- Repeat a series of fricatives, nasal and vowel sounds (e.g./sma: sma/)

Phonation

**A. for phonatory incompetence**

- Pushing techniques
- Holding breath exercises
- Head turning toward the affected side
- Lee Silverman Voice Treatment (LSVT)
- Smith accent method

**B. Phonatory stenosis**

- Head and neck relaxation
- Easy onset of phonation
- Smith accent method
Phonation (Smith Accent)

- *Smith accent method* is used for modification of both phonation and respiration.
- The rhythmic accentuation of the accent method directly help to improve prosody and voice.
- The improved breath control help also to reduce the labored nature of dysarthric speech.
- The accent method rests technically on three major principles
  1. Optimal abdomino-diaphragmatic breath support.
  2. Rhythmic play of accentuated relaxed vowels with progressive carry over to connected speech.
  3. Dynamic rhythmic body and arm movements.

Phonation

Lee Silverman Voice Treatment (LSVT)

- It began as a treatment program for Parkinson disease, and now includes other neurological disorders.
- It is an intensive, behavioral treatment given in sixteen sessions in one month and intended to increase intelligibility and vocal loudness.

LSVT consists of five essential concepts:

- **Concept 1**: focus on voice (Increase/improve vocal fold adduction)
  - Simple: "think loud/think shout"

- **Concept 2**: focus on high effort (Phonatory and Physical)
  - Patient rationale: Overrides rigidity and hypokinesia by pushing patients to new effort levels by putting the "load on the larynx." Dealing with a progressive neurological disease
  - Clinician rationale

- Clinician effort equals patient effort (scaling)
Phonation
Lee Silverman Voice Treatment (LSVT)

- **Concept 3**: focus on intensive treatment (16 sessions of individual treatment in one month)
- Daily opportunity to practice increases likelihood of "building daily increments of vocal effort."
- Maintain motivation and accountability
- Maximize habituation and carry over
- **Concept 4**: focus on calibration
- Definition: The patient "knows" and "accepts" the amount of effort needed to consistently increase vocal loudness to a level that is within normal limits. As a result, the relationship between increased vocal effort and vocal output is established. When a patient is calibrated, she uses her louder voice "automatically" in her daily communication and is able to maintain this louder voice
- **Concept 5**: Quantification
- Objective methods to document improvement to motivate patient and provide feedback.

Respiration

- **Producing consistent subglottal pressure** water manometr (5cmH2o for 5 sec), vowel prolongation, VP2.
- **Pulling, pushing and bearing down during speech or nonspeech tasks**
- **Slow and controlled exhalation**
- **Optimal breath group** Number of syllables a patient can produce comfortably in one breath, keep utterance within the OBG, increase length of sent in OBG without increase rate or decrease loudness.
- **Postural adjustment**
- **Smith accent method**
Rate Control

facilitate articulatory precision and intelligibility by allowing
time for full range of movement, increasing time for
coordination and improving linguistic phrasing.

- **Vowel prolongation:** better to decrease rate by
  increasing pause

- **Prosthetic management**
  - Delayed auditory feedback (DAF) 50-150msec
  - Pacing devices as pacing boards syllable by syllable attack
  - Using visual feedback

- **Non prosthetic rate reduction**
  - Hand and finger tapping
  - Using visual feedback
  - **Rhythmic cueing:** technician points to words in
    rhythmic fashion, more time to prominent words and pauses.
  - **Pacer/Tally program:** analyse text no of syll/w, punct. Pause in specified rate, speaker follow pacing signals.
Prosody and Naturalness

Aim: maximize the accuracy of prosodic patterns and their naturalness
Naturalness perceptually derived overall description of prosodic adequacy

- **Working at the level of breath group** basic unit of prosody
  (prosodic pattern in single exhalation), ext bg by resp-phon control, use
  pause at logical syntact boundries

- **Contrastive stress tasks** (response w segment information not
  vary but stress pattern do)

- **Referential tasks**: pre-specified stress target sent

- **Signaling stress by pitch, loudness and duration modification**
  (stressed words hold for longer duration)

- **Intonation drills** (declarative x interrogative, polite & direct
  imperative)

- **Good phonatory control: accent method**

Apraxia of Speech (AOS)

- **Treating AOS**
  - Strength or ROM is not the problem
  - Speech difficulties may increase with increased effort
  - Facilitate increasing automaticity of speech
  - Strategies:
    - Progressive complexity
      - automatic
      - oral/nasal, voicing, manner, place
      - bilabial->alveolar-> velar
      - singletons->clusters
      - high frequency -> low frequency
      - short -> long length of utterance
    - Many repetitions
    - Melodic intonation therapy
    - Visual cues
    - Tactile cues
    - Decreasing rate MAY help
<table>
<thead>
<tr>
<th>patient</th>
<th>Assessment</th>
</tr>
</thead>
</table>
| 1. PROSODY | • Rate: increase, decrease, variable, short rushes  
              • Stress: (increase, decrease, equal, variable)  
              • Tonality: monotonous, variable |
| 2. ARTICULATION: | Consonant precision, subst or distortion.  
The compensatory articulation  
Vowel: distorted, prolonged  
Segment repetition |
| 3. RESONANCE | Hypermasslit  
Hyponasality  
nasal emission |
| 4. VOICE: | Quality (GRBAS)  
Pitch (inc, dec, diplogonia, breaks)  
Loudness (inc, dec, decay, tremor, variation) |
| 5. BREATHING: | labored, uncoordinated |
| 6. GENERAL INTELLIGIBILITY: | |
DANIELO
11449861
51YS
PHILIP
CVS
FREE CT

FLACCID
BREATHY ROUGH VOICE
CONSON IMPRECISION
SHORTNESS OF BREATH

CAROL KAKA
87670534
68YS
BRITISH
MRI: CVS. CEREBELLAR Lesion

Speech imprecise consonants, irregular articulatory breakdowns and distorted vowels
ATAVIC DYSARTHRIA
- AIDA
- 4087127
- 36 YS GRADUATED
- MULTIPLE SCLEROSIS 10 YS
- MRI TYPICAL MS PATCHES
- Non speech: Visual disturbances: diplopia, impaired color perception, decreased visual acuity and impaired central vision.

**MIXED FLACCID-ATAXIC**

Speech:
- BREATHY ROUGH VOICE
- poor loudness control
- CONSON IMPRECISION
- SHORTNESS OF BREATH

- HASHIM 1195131
- 29YS
- UAE
- CLEAR MRI
- **CHOREOASTHTOTIC CP**

*Hyperkinetic Dysarthria*

*prosodic excess*: prolonged intervals, excess and equal stress, Variable rate of speech
- monopitch, monoloudness, Inappropriate silences
- **MARYAM**
- 5691729
- 65 YS UAE

**MULTIPLE CVS**
**CT Atrophic BRAIN CHANGES**

SPEECH: HYPOKINETIC DYSARTHRIA
SEGMENT REPETITION
FAST RUSHES OF SPEECH
PROLONGATION
INAPPROPRIATE SILENCE

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- **ENAYAT 18/6/13**
- HC: 85980561
- 67 YS PAKISTANI
- CVS, FREE CT

UUMNL DYSARTHRIA
SPEECH: CONS IMPRECISION
SLOW AMR
Thank You