

NEWCASTLE DYSARTHRIA ASSESSMENT TOOL (N-DAT)

Circle the appropriate information and make comments. Interpret your findings using the Dysarthria Differential Diagnosis Tool.

You will need: a stopwatch, a mirror, a voice recorder, and the cookie theft picture and/or the caterpillar passage.

Norms: within 1 standard deviation of the norm is considered within normal limits.

Patient Name:	Date:	SP:
Case history:	Site of lesion: Time post injury: Other contributing factors:	
OMA:	Cranial nerve involvement: Consider: weakness, spasticity, coordination, voice, swallow, cough Implications:	
Intelligibility	Observation: conversational speech Task: spontaneous speech <i>"Tell me about this picture." (Cookie theft picture) and/or "Can you read this for me" (The Caterpillar Passage).</i> <ul style="list-style-type: none"> • Intelligible • Intelligible with some difficulty • Unintelligible 	Consider Characteristics: <ul style="list-style-type: none"> • Breathing • Loudness • Pitch • Voice Quality • Hypernasality • Hyponasality • Nasal Emissions • Stress • Articulation Precision • Speech Rate • Percentage Intelligible • Utterance Length
Respiration	Observation: breathing <ul style="list-style-type: none"> • Clavicular, thoracic, abdomen breathing • Rapid, shallow, laboured • Short breath phrases • Irregular posture Observation: breathing rate per minute <i>"I'm going to look at your breathing. Breathe normally and I'm going to see how many breaths you take in one minute"</i> Breaths: _____ Norm: 12-18 † ¹	
Phonation	Observation: voice <ul style="list-style-type: none"> • Loudness: adequate, loud, soft, variable • Pitch: adequate, high, low, variable • Quality: adequate, rough, strain-strangled, breathy, glottal fry • Other: _____ 	

Phonation cont.**Task: maximum phonation time (MPT)**

"Take a deep breath then make the /a/ sound for as long as you can. We will do this 3 times"

Repeat 3 times and take the highest score.

1: _____ seconds 2: _____ seconds 3: _____ seconds

Norms: ^[3]

Adult Males	Adult Females
Critical Region (95%): 15.0 – 62.3	Critical Region (95%): 14.3 – 40.4

Task: S/Z ratio

To avoid repetition, please take the 3 /s/ scores from the respiration task above.

"Take a deep breath then make the /z/ sound for as long as you can. We will do this 3 times"

Repeat 3 times and take the highest score.

1: _____ / _____ seconds 2: _____ / _____ seconds 3: _____ / _____ seconds

Norm: when each sound is sustained for the same amount of time the ratio is 1 (ideal). If the /s/ is phonated longer than /z/ this will be reflected by ratios greater than 1. An s/z ratio of 1.2 or greater indicates possible vocal fold pathology. ^[4]

For example: longest S=20 seconds; longest Z=16 seconds (20 divided by 16) = 1.25 s/z ratio.

Task: ability to sustain volume

"Count to 5 as softly as you can and then as loudly as you can"

- Ability: able, unable, inconsistent

Task: pitch glide

"Glide on a vowel from high to low pitch and then low to high pitch" (provide a model)

- Ability: able, unable, variable
- Pitch range: adequate, reduced, variable
- Pitch control: adequate, phonation breaks, change in voice quality

Resonance ^[5]**Observation: nasality**

- Adequate, hypernasal, hyponasal, nasal emissions

Task: hyponasality ^[6]

"Say each word or phrase normally and then repeat with a blocked nose" (provide a model)

Circle words which sound different when nares are closed.

Note the following word lists / sounds transition from high → mid → low vowel sounds.

Interpretation: If no change is heard with and without occluded nares hyponasality is present.

Mary makes mince on Mondays count 90-99

Task: hypernasality ^[6]

"Say each word or phrase normally and then repeat with a blocked nose" (provide a model)

Circle words which sound different when nares are closed.

Note the following word lists / sounds transition from high → mid → low vowel sounds.

Interpretation: if change is heard when nares are occluded hypernasality is present.

Buy bobby a puppy, buy baby a bib

References:

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DYSARTHRIA AETIOLOGY AND PLANNING TOOL ^[9]

Aetiology and possibility of mixed dysarthria presentations within populations. Circle the appropriate information.

	FLACCID / LMN	SPASTIC / UMN	ATAXIC / CEREBELLAR	HYPOKINETIC / EXTRAPYRAMIDAL	HYPERKINETIC / EXTRAPYRAMIDAL	MIXED
Neuro-muscular condition	Flaccid paralysis Weakness Hypotonia Muscle atrophy Fasciculations	Spastic paralysis Weakness Limited ROM Slowness of movement	Inaccurate movement Slow movement Hypotonia	Slow movements Limited ROM Immobility Paucity of movement Rigidity Loss of automatic aspects	<p>QUICK Quick invol. movements Variable muscle tone</p> <p>SLOW Twisting/writhing Slow movements Invol. movements Hypertonia</p>	Most common mixes: Flaccid-spastic: 42% Ataxic-spastic: 23% Hypokinetic-spastic: 7% Ataxic-flaccid-spastic: 6% Hypokinetic-hyperkinetic: 3% Other: 19%
Possible diagnosis	Stroke Bulbar palsy Bell's palsy Myasthenia gravis	Stroke Spastic hemiplegia Pseudobulbar palsy Encephalitis	Stroke Friedreich's ataxia Toxic effects (e.g. alcohol)	Parkinson's disease Drug induced	<p>QUICK Myoclonus Chorea</p> <p>SLOW Athetosis Dyskinesia Dystonia</p>	<ul style="list-style-type: none"> ▪ Amyotrophic lateral sclerosis: spastic-flaccid ▪ Multiple sclerosis: spastic-ataxic ▪ Wilson's disease: hypokinetic-spastic-ataxic ▪ Shy-Drager Syndrome: hypokinetic-spastic-ataxic-flaccid ▪ Progressive supranuclear palsy: hypokinetic-spastic-ataxic

Clinical Hypothesis / Management Plan:

Type / Severity / Aetiology:	
Characteristics:	
Therapy Plan:	
Re Assessment Plan:	

DYSARTHRIA DIFFERENTIAL DIAGNOSIS TOOL ^[9]

Consider your client's presentation to assist with the clinical differential diagnosis process. Circle the appropriate characteristics.

Clinical Presentation ++ indicates distinguishing when present; + indicates may be present but not generally distinguishing; * indicates also consider apraxia of speech.	FLACCID / LMN	SPASTIC / UMN	ATAXIC / CEREBELLAR	HYPOKINETIC / EXTRAPYRAMIDAL	HYPERKINETIC / EXTRAPYRAMIDAL	COMMENTS
RESPIRATORY						
Audible inspiration	++				+	
Sudden inspiration/expiration				++		
Speaking on inhalation	++					
PHONATION						
Breathiness	++			+		
Harshness		++			+	
Strained strangled		++			+	
Voice arrests				++		
Voice tremor				++		
Diplophonia	++					
Low pitch		++			+	
Monopitch*	+	+		++	+	
Pitch breaks	+	++				
Reduced loudness	+			++		
Monoloudness*	+	+		++		
Excess loudness variation			++		++	
Inappropriate vocal noises					++	
RESONANCE						
Hypernasality	++	+		+		
Hyponasality	++				+	
Nasal emissions	++					
PROSODY						
Excess and equal stress*		+	++			
Reduced stress				++		
ARTICULATION						
Irregular breakdowns*			++		+	
Inconsistent artic errors*			+		+	
Distorted vowels*			++		++	
Prolonged phonemes*			++		+	
Repeated phonemes*				++		
Telescoping of syllables*			++			
Slow rate*		++	+		+	
Increased overall rate				++		
Variable rate				++	+	
Short phrases	++	+			+	
Short rushes of speech				++		
Palilalia				++		
Echolalia				+	+	
ALTERNATE MOTION RATE						
Slow but regular AMRs		++				
Slow and irregular AMRs			+		++	
Rapid 'blurred' AMRs				++		
Irregular AMRs			++		++	
OTHER						
Inappropriate silences				++	+	

DEFINITIONS LIST

RESPIRATION

- Audible inspiration: stridor on inhalation as a result of inadequate abduction of the vocal folds.
- Sudden inspiration/expiration: speech is interrupted by sudden, forced inspiration and expiration sighs.
- Speaking on inhalation: speech occurs during inspiration.

PHONATION

- Breathiness: audible air escape during phonation, resulting in reduced loudness and short utterances as a result of running out of air during speech.
- Harshness: may also be described as rough/hoarse and can often be paired with breathiness, tension or strain.
- Strained strangled: phonation presents as effortful with difficulty controlling voicing as it fades in and out.
- Voice Arrests: inappropriate and sudden stoppages of voicing
- Voice Tremor: involuntary rhythmic variations in pitch and loudness, with an unsteady, “wobbly” perceptual quality. Most obvious on sustained vowels.
- Diplophonia: two distinct pitches heard simultaneously, can sound like two voices talking at once.
- Low pitch: inability to produce higher pitch ranges.
- Monopitch: speech that lacks variation in pitch and inflection, can also present as an inability to voluntarily vary pitch.
- Pitch Breaks: brief, sudden, unexpected and uncontrolled shifts in pitch can occur in either upward or downward directions.
- Reduced loudness: reduced loudness range, and can result in an inability to produce loud sounds.
- Monoloudness: speech that lacks variation in loudness, may also present as inability to voluntarily vary loudness.
- Excess loudness variation: unpredictable and uncontrolled variations of loudness.

RESONANCE

- Hypernasality: excessive resonance in the nasal cavities, often due to velopharyngeal dysfunction, particularly perceptible on vowel productions.
- Hyponasality: insufficient resonance of air in the nasal cavity.
- Nasal emission: the sound of air forcefully flowing through the nose during speech due to poor valving between the oral and nasal cavities.

PROSODY

- Excess and equal stress: excess stress on usually unstressed parts of speech (e.g. monosyllabic words, unstressed syllables of polysyllabic words).
- Reduced stress: speech shows reduction of proper stress or emphasis patterns.

ARTICULATION

- Telescoping of syllables: an inconsistent breakdown of articulation in which a syllable or series of syllables are suddenly or unpredictably run together.
- Pallialia: the repetition of utterances which generally involve words and phrases. Most prominent during spontaneous speech and towards end of an utterance (but can occur anywhere). The repetitions progressively reduce in loudness and increase in rate.
- Echolalia: unsolicited repetition of another’s utterances. Repetition may be complete or partial, sometimes with spontaneous correction of syntax (e.g. “Where am I going?” “In response to “Where are you going?”)

ALTERNATE MOTION RATE

- Alternating motion rates (AMR’s): (or diadochokinetic (DDK) rates): are useful for judging the speed and regularity of reciprocal jaw, lip and anterior and posterior tongue movements. They permit observations of articulatory precision, the adequacy of velopharyngeal closure and respiratory and phonatory support for sustaining the task. During the task, observe range of motion, coordination and rhythmicity of jaw, lips and tongue. Extraneous movements (e.g. tongue protrusion, lip smacking, pursing) may represent an underlying movement disorder.
- Sequential motion rates (SMR’s): measure ability to move quickly and in proper sequence from one articulatory position to another. Relative to AMR’s, planning or programming demands for SMR’s are high. For this reason, SMR’s are particularly useful when apraxia of speech is suspected.