**RESONANCE, VELOPHARYNGEAL & NASAL AIRFLOW:**
**ASSESSMENT COMPONENTS**

**REFERRAL QUESTIONS:** Include those from client, parent, physician, community SLP, craniofacial team and other referral source(s)

**BACKGROUND**

Review of Case History Form (if available)/Client or Parent Interview/Relevant Case History:
Information gathered or information provided in the following areas:
- Onset and course of current Resonance issues
- History of other or related medical diagnoses:
  - May be related to congenital diagnoses, e.g. Cleft lip and palate, syndromes (e.g. 22q deletion syndrome, Pierre Robin sequence, etc.)
  - History of otitis media, insertion of pressure equalizing tubes (P.E.)
  - Past surgeries especially those related to congenital problems
  - Lip repair, primary or secondary hard palate repair, soft palate repair
    - E.g. Palatal push-back, Furlow technique, sphincteroplasty, pharyngeal flap, Le Fort procedures
  - May also be related to adenoidectomy & tonsillectomy
- Pharmacological factors/medications: current and immediate past
- Feeding issues, including food sensitivity, nasal regurgitation
- Educational background and premorbid intellectual levels (as appropriate)

**ASSESSMENT FINDINGS**

**Hearing screening:** Used to examine hearing adequacy overall and for purposes of ascertaining likely effects on the day’s results; follow ASHA guidelines.

**Speech, Resonance and Voice Samples:** Perceptual assessment of resonance, quality, pitch, intensity, rate, and respiratory patterns. Perceptual assessment will continue throughout session.
- Informal conversational sample during client interview or play sample
- Formal assessments as described below

**Oral-peripheral Examination:** Used to determine adequacy of structures for velopharyngeal function and speech. Use an examination form that allows for adequate examination of: facial & intra-oral symmetry & function, VP function; Especially observe:
- Lips: asymmetry, cupid’s bow, lip pits, short or tight upper, any facial scarring
- Note philtrum & columella
- Hard palate: note any fistulas & placement, asymmetry, high arch, narrow arch
- Uvula: bifid, absent, hypoplastic, dimpling,
- Velum: elevation & palatal lengthening (may not be readily observable from the A-P position)
- Dentition: unremarkable, missing, mal-alignment, diastema, supernumerary
- Occlusion: unremarkable, open bite, overbite, cross bite, collapse, Class (I, II, III)
  - Note current orthodontia or plans for such
• Faucial pillars & Tonsil location, size & encroachment on the oral-pharyngeal space
• Lateral pharyngeal wall movement toward midline in concert with velar elevation & lengthening
• Ability to puff-up cheeks (Tongue Anchor technique)
  o without tongue protruded
  o with protrusion (Q: Does air in mouth diminish w/ tongue protruded?)
• Swallowing difficulties: reported & observed
• Motor Speech exam, as needed: may be assessed if neurological deficits are suspected and to support recommendations for further neurological work-up

Testing Environments
• Single phonemes: This will be useful when planning tx (e.g. “Hyponasality Modification Program”)
  o Vowels: Assess alone and then with a variety of consonants in a CV combination
  o Single fricatives: Ability to produce isolated fricatives (can individual maintain oral airflow: e.g. /θ, s, f, ñ/)

• Connected speech: Look for
  o Quality of vowels and non-nasal consonants
  o Facial or nasal grimacing
  o Does nasality increase in connected speech as oppose to single sounds/words
  o Environments: Informal conversation, Nursery rhyme, reading passage

• Single word articulation test: (e.g.: GFTA, HAP-3, DEAP, Arizona, etc.)
  o Articulation analysis to determine
    ▪ Placement errors vs. compensatory articulation productions
    ▪ Nasal phonemes for oral phonemes
    ▪ Weak or omitted consonants

• Repetition of pressure-sensitive phonemes at sound, word, and phrase levels
  o Pa-pa-pa-pa, ta-ta-ta-ta, ka-ka-ka-ka
  o Rating Scales: E.g. Brackett Scale: repetition of high & low vowels with a variety of consonants
  o Increase complexity by repeating a word: e.g. “baseball bat, baseball bat, baseball bat”
  o Assess Consistency: does nasality occur on all pressure sensitive sounds or just on certain ones? (In general, inconsistency has a better prognosis than consistent nasality.)

• Repetition of sentences loaded with pressure-sensitive phonemes
  o “Popeye plays baseball.”
  o “Buy baby a bib.”
  o “Take Teddy to town.”
  o “Do it for daddy.”
  o “I eat cherries and cheese.”
• Counting from 60-100 (individual may have to repeat if reading is not possible)
  o 60-69: has a lot of pressure sensitive phonemes (/s/)
  o 70-79: can assess assimilative nasality because of the presence of /n/
  o 80-89: very few pressure consonants
  o 90-100: should sound normal

• Counting on one breath:
  o See if utterance length is impacted by nasal emission
  o If individual loses air support through nose, utterance length will ↓

Instrumental: Nasometer (if available)
• MacKay-Kummer Simplified Nasometric Assessment Procedures-Revised 2005 (SNAP):
  o This tool was developed in 1994 to improve the diagnostic value of nasometry and to make administration easier with children and non-compliant patients.
  o It is normed for use with the Nasometer II which can provide objective data.

Dysphonia Evaluation: This is included since many individuals with VPD have co-occurring dysphonia characterized by vocal roughness/hoarseness & decreased intensity.
• Prolongation of a vowel to assess quality of vowel
• Glissando up and down
• See if changing pitch, especially elevation, improves phonational consistency and quality

Supplemental Tests of Nasal Air Emission
• Cold Mirror: look for fogging on “pa-pa-pa” or “60-60-60”
• See Scape: “sa-sa-sa” in both nostrils
• Straw: straw in nose will amplify nasal emission sounds
• Air Paddle: lightweight paper-paddle held beneath nostril
• Feel the side of the nose
• Cul-de-sac test: alternating closing off the nose

Facilitating techniques/Stimulability Testing
• Depends on the characteristics observed
• Used to determine efficacy of methods to improved resonance
• May be used in a child’s I.E.P.
• Use of patient information, obtained data, etc. to determine appropriate techniques
• Success in any particular technique may provide a starting point for future therapy

Perceptual: speech/resonance: Determine TYPE of resonance
• Normal/abnormal
• Hypernasality
• Hyponasality
• Cul de sac resonance
• Mixed
• Use of a rating scale:
  • E.g. mild, moderate, severe OR “-3, -2, -1, 0, +1, +2, +3”
Behavioral Observations: Obtained throughout session in a variety of vocal environments
  • May be different depending on communication partners

SUMMARY and INTERPRETATION:
  • Restate client name and age and address referral questions
  • Provide summary of the type and severity of resonance dysfunction as compared to what is typically expected by age and gender
  • Provide supporting information about related conditions (e.g., medical diagnoses or surgical history; suspected etiologic or exacerbating factors)
  • Include the functional impact for that client
  • Include positive or negative prognosticators
  • May include Vermont eligibility requirements for services in the schools. A separate paragraph or subheading may be useful when addressing this issue. Medically related issues may fall under a different standard when attempted to insure eligibility for ages 0-21 years.
    • Speech intelligibility may be included here, especially for school eligibility purposes

RECOMMENDATIONS
Recommendations may include statements about:
  • Need for further assessment, follow-up or referral; e.g. MD, specialist, further testing (e.g. nasopharyngoscopy, videopharyngoscopy, MBS) etc.
  • Intervention:
    o Include information concerning frequency, estimated duration, and type of service delivery.
    o In addition, state potential Long Term Goals and Short Term Objectives, specific treatment approaches (if recommended), degree of family involvement, and other supporting information

PROGNOSIS: This statement will provide support for client’s ability to make changes in resonance and speech production.
  • Provide strong rationales for why above recommendations are made.
    o Use of physiological and/or medical reasoning, if available

PLAN: Include the next steps for the client, parent or Center; e.g. when report is expected, who will be contacted & when (client, parent, school & SLP, Craniofacial Team, M.D., insurance carrier)

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