GOALS FOR TODAY’S TIME


2. Consider ways that treatment planning for voice disorders differs from treatment planning in other areas of the field.

3. Explain how the vocal tract can be used as a primary tool in voice therapy.

4. Present the rationale, physiology, protocol, and evidence for four key physiologic voice therapies.

5. Review treatment principles for three commonly seen special populations.

EVALUATION OF VOICE - HISTORY TAKING

- Perhaps the most important part of the voice evaluation
- 1. History of the problem
   - Chief complaint, onset, course, duration
- 2. Medical history
   - Overview of key systems
- 3. Occupational / Educational History
- 4. Social / Voice Use History

EVALUATION OF VOICE - THE PERCEPTUAL VOICE EVALUATION

- Evaluate respiration, phonation, resonance
- Respiration - supportive / nonsupportive, maximum phonation time, syllables per breath
- Phonation - Pitch, Loudness, Quality
- Resonance - Vocal & Oronasal Resonance
GRBAS SCALE  
(HIRANO, 1981)

GRADE  
ROUGHNESS  
ASTHENIA  
STRAIN  

SCALE 0 - 3  
0 = NORMAL  
3 = SEVERE  

SIMPLE, RELIABLE MEASURE

PATIENT-REPORT MEASURES

* These instruments play a pivotal role in the development of informed therapeutic decisions. * 
Branski et al., 2010

- A crucial part of the voice evaluation
- Establishes patient’s perspective - may be quite unlike the SLP’s
- Excellent tool for demonstrating progress with Tx
- Many tools available for general population and special populations
- See Branski et al., 2010 for brief description and review of most used tools.

GENERAL POPULATION

- Voice Handicap Index (VHI) - 30 items
- VHI-10 - 10 items
- Voice-Related Quality of Life (V-RQOL) - 10 items
- Voice Outcomes Survey (VOS) - 5 items
- Voice Activity and Participation Profile (VAPP) - 28 items
- Voice Symptom Scale (VoISs) - 30 items

PEDIATRICS

- Pediatric Voice Handicap Index (pVHI)  
  - 23 items, proxy
- Pediatric Voice Related Quality of Life (PV-RQOL)  
  - 10 items, allows for proxy
- Pediatric Voice Outcomes Survey (PVOS)  
  - 4 items, allows for proxy

LARYNGEAL VISUALIZATION

- Don’t do treatment without it!
- Various methods
  - Mirror
  - Flexible scope
  - Rigid scope
- Scoping can be with or without stroboscopy (strobe offers better understanding of physiology)
TREATMENT PLANNING

▸ Impressions
  ▶ Severity
  ▶ Features of the dysphonia
  ▶ Contributing factors
▸ Prognosis
  ▶ Must be given much consideration in voice
▸ Recommendations
  ▶ Type of Tx, Frequency, Duration

TREATMENT PLANNING - FREQUENCY AND DURATION

▸ Much of voice therapy applied:
  ▶ 1 X week
  ▶ 6-10 weeks
  ▶ Home programs
  ▶ Use of technology to motivate and support home practice (van Leer and Connor, 2011)
  ▶ With many conditions - response expected within above timeframe

TREATMENT PLANNING - CHOOSING THE APPROACH

▸ Many voice disorders / diagnoses are successfully treated today using a physiologic orientation to voice therapy.
  ▶ We will review four specific physiologic approaches today.
▸ Vocal hygiene may be used as a supplement to the primary method.
  ▶ Hygiene alone is NOT supported by the evidence.
  ▶ Seems to “insulate” from further deterioration of the voice.
▸ Some special populations require a more symptomatic approach.

TX PLANNING - HISTORICALLY

▸ Voice therapy based on a set of facilitating techniques (Boone and others)
  ▶ Multiple targets / methods in Tx
  ▶ No cohesive theoretical framework; fragmented
  ▶ Much trial and error
  ▶ Limited evidence; hard to study

TX PLANNING - DEVELOPMENTS

▸ Greater understanding of anatomy and physiology of voicing
  ▶ Stroboscopy, Titze’s Principles of Voice Production, biomechanics research
▸ Physiologic approaches to treatment emerge
▸ More cohesive, systematic methods (“programs”) emerge
  ▶ Lend themselves to scientific study; evidence emerges
  ▶ Allow for more structured, consistent training of clinicians

Van stan, et al., 2015
Several well-studied programs available
- Programs tend to be broad in their application (work across diagnoses, voicing patterns, etc)
- The “occasional” voice therapist able to implement the most cutting edge methods
- Tx planing simplified

Tips:
- Patient education is a vital first step in treatment.
- Cautions:
  - Must avoid becoming “cookbook”
  - Still a place for facilitating methods from generations past
  - Must realize the special populations that don’t respond to typical physiologic methods

Patient education is a vital first step in treatment.
Cautions:
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- Must realize the special populations that don’t respond to typical physiologic methods

WHAT IS PHYSIOLOGIC VOICE TX?

Therapy program involving exercises or vocal maneuvers that attend to all three subsystems of voice production at once, respiration, phonation, and resonance.

Includes treatments such as: LSVT, Vocal Function Exercises, Accent Method, Resonant Voice Therapy, Manual Circumlaryngeal Technique.

WHY A PHYSIOLOGIC APPROACH?
- Targets correct physiology
- Targets multiple facets of voice with a single training focus
- Simple for patients to learn / manage
- Tends to be effective across a broad spectrum of voice disorders
- Supported by the evidence (theoretical and clinical)

PHYSIOLOGIC APPROACHES COVERED TODAY
- Vocal Function Exercises*
- Resonant Voice Therapy*
- SOVT with Straws and Tubes*
- Stretch and Flow

*Represents a type of Semi-Occluded Vocal Tract Exercise. Uses the vocal tract to support efficient phonation.
VOCAL FUNCTION EXERCISES (STEMPLE, 1993)

A series of systematic voice manipulations, similar in
to physical therapy for the vocal folds, designed
to strengthen and coordinate the laryngeal musculature,
and to improve the efficiency of the relationship among
airflow, vocal fold vibration, and supraglottic treatment of
phonation.

GENESIS OF VFE

- Bertram Briess
- Robert Stimpert
- Joe Stemple
  - Studied rehabilitation of the knee (PT)
  - Applied knowledge of laryngeal anatomy/physiology to achieve a
    program for “rehabilitating” the larynx
  - Restrengthen and coordinate laryngeal muscles
  - Improve relationship between 3 subsystems of voice

VFE PROTOCOL

- A series of 4 exercises
- Systematically exercise all 13 intrinsic laryngeal muscles
- Technique
  - Proper posture
  - Breathing
  - Placement / Focus
  - Onset of tone

VFE EXERCISE 1 - WARM-UP

- Sustain the vowel /i/ for as long as possible on the musical
  note (F)
  - F above middle C for females
  - F below middle C for males
  - Goal: Based on airflow volume with aerodynamic testing.
    - Can also estimate goal with timing patient’s sustained /s/ production
    - “Sustain the tiniest, softest /s/ possible for as long as
      you can.”
- Technique
  - As softly as possible
  - An extreme forward focus
    - “almost - but not exactly - nasal”
  - Feel resonance in palatal area
  - NOT simply a nasal tone - still demonstrate oral air flow
VFE EXERCISE 2 - STRETCHING

▸ Glide from your lowest note to your highest note on the word “knoll”
  ▸ Technique - Achieve “lip buzz”
  ▸ Goal - Perform with no voice breaks
  ▸ Vocal tract posture

VFE EXERCISE 3 - CONTRACTING

▸ Glide from a comfortable high note to your lowest note on the word “knoll.”
  ▸ Technique - Achieve “lip buzz”
  ▸ Goal - Perform with no voice breaks
  ▸ Vocal tract posture - same as exercise 2

VFE EXERCISE 4 - ADDUCTORY POWER

▸ Sustain the musical notes (C-D-E-F-G) for as long as possible on the word “old” without the /d/.
  ▸ Technique - Achieve “lip buzz”
  ▸ Goal - ___ seconds (same as exercise 1)
  ▸ Vocal tract posture - same as exercises 2 & 3

THE PROTOCOL

▸ Do each exercise 2X each, 2X per day
  ▸ Exercise 1 twice
  ▸ Exercise 2 twice
  ▸ Exercise 3 twice
  ▸ Exercise 4 twice

REMINDERS

▸ Do each exercise as softly as possible, but engaged.
▸ Monitor tones for excessive breathiness, wavering, etc
▸ Monitor for proper tone placement.
  ▸ Frontal tone focus without tension.
▸ Easy onset without breathiness.
▸ Can slowly “wean” from program

SOME BENEFITS OF VFES

▸ A positive approach to voice
▸ Makes sense to patients when related to PT
▸ Expectations for time are reasonable
▸ Patients can see/hear the progress
▸ Research shows Tx to be robust
VFE - SOME TIPS

- Match notes to pitch pipe, keyboard, piano, smartphone app
- Patient keeps simple record of daily practice
- Estimated completion time 6-10 weeks (not all spent in Tx)
- May have mild laryngeal (muscle) aching the first few days

THE EVIDENCE FOR VFES


CASE 1

NODULES

- 7 year old female
- Bilateral growths affect closure and vibration
- Goals of Tx: reduce impact on TVC edge, resolution of nodules, achieve normal patterns of voicing

CASE 2

UNILATERAL VOCAL FOLD PARALYSIS

- UVFP - various types; most common type has VF fixed near midline
- 57 year old female
- Concerns - lack of full closure, weak voice, breathy voice, few syllables/breath, mild stridor with exertion
- Goal - Improve closure / contact of VF edges; Achieve best voice possible without hyperfunctional patterns

CASES - ANALYSIS

- VFE protocol...
  - Reduced glottal edge impact in nodule case
  - Improved glottic closure in paralysis case
  - Provided most efficient voice possible in both cases
  - Addressed hyper function…and hypo function.
### THE ORIGINS OF RVT
- Arthur Lessac (1965)
  - *The Use and Training of the Human Voice*
  - For those in performing arts
  - Proposes that a “well-placed” voice will yield optimal functioning of respiration, phonatory, and resonance systems.
    - Basic science studies would prove his theory correct.
    - Among the first to shift our focus to the all-important vocal tract.

### WHAT IS A RESONANT VOICE?
- Voice produced with perceptible anterior oral sensory vibrations; voice produced in the context of an “easy voice.”
- Key features:
  - Feel the voice vibrating anteriorly
  - Feel as though voice production is easy, effortless
  - Despite ease of production, hear a “swell” in the voice

### THE DEVELOPMENT OF RVT
- Verdolini
  - Expanded on Lessac’s premise; applied it clinically to voice disorders.
  - Developed Lessac-Madsen Resonant Voice Therapy Protocol (LMRVT)
- Titze, Berry, and others
  - Examined the biomechanical foundations of the resonant voice
  - Computer modeling; modeling in the canine larynx
  - Variations of resonant voice therapy used clinically.

### BIOMECHANICS OF RVT
- **WHAT HAPPENS PHYSIOLOGICALLY TO ACHIEVE THE RESONANT VOICE?**
  - Berry et al., 2001
  - Vocal folds barely ad/abducted
    - 0.6mm gap between folds achieved maximal acoustic output...
    - ...and lowest impact stress during vibration
    - ...and large amplitude during VF oscillation
  - This vocal fold posture corresponds with the “resonant voice.”

### IMPACT STRESS AND OUTPUT/COST RATIO AT VARIOUS GLOTTAL WIDTHS

<table>
<thead>
<tr>
<th>Glottal Width (mm)</th>
<th>Impact Stress</th>
<th>Output/Cost Ratio</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>0.5</td>
<td>2.0</td>
</tr>
<tr>
<td>0.5</td>
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<td>0.5</td>
</tr>
<tr>
<td>1.5</td>
<td>2.0</td>
<td>0.3</td>
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### TENANTS OF RESONANT VOICE THERAPY
- Experiential
- Based upon processing sensory info during voicing
- Single training focus is resonance - affects/corrects all other aspects of voicing
- Multiple repetitions; excellence training
STRETCHES AND BREATHING WARM-UPS

▸ Shoulders
▸ Neck
▸ Jaw
▸ Floor of mouth
▸ Lips
▸ Tongue
▸ Pharynx

BASIC TRAINING GESTURE

▸ Hmmm - molm - molm - molm (as a sigh)
▸ Extreme frontal focus
▸ Good breath support
▸ Make the connection - abdominal muscles to lips / face

STAGE 1 - ALL VOICED

1. “molm - molm - molm” on the note ______
   ▸ sustained pitch
   ▸ discover the vibrations (broad vs narrow)
   ▸ eventually word toward a narrow vibration (like a beam of light)
   ▸ increase the ease of production - 1/2 the effort….

2. molm-molm-molm...
   ▸ slow - fast - slow
   ▸ soft - loud - soft

3. molm-molm-molm
   ▸ non-linguistic phrasing
   ▸ vary rate, pitch, loudness
   ▸ feel connection abdomen to lips

4. Chant voice phrases on musical note ______.
   ▸ Mary made me mad
   ▸ My mother made marmalade
   ▸ My merry mom made marmalade
   ▸ My mom may marry Marv
   ▸ My merry mom may marry Marv
   ▸ Marv made my mother merry

5. Overinflect the above phrases (maintaining steady voicing)

END OF STAGE 1

▸ Patient has developed proper shaping of the vocal tract for efficient, easy voicing
▸ Folds have remained in a steady adducted state through all exercises.
▸ Patient now ready to vary the laryngeal posture slightly.
STAGE 2 - VOICED VOICELESS CONTRASTS

- Basic Training Gesture
  1. mamapapa... vary the rate on the note _______
  2. mamapapa...
     - slow-fast-slow
     - soft-loud-soft on _______
  3. mamapapa... As speech
     - use intonation of non-linguistic phrases
     - vary rate, pitch, loudness,
     - make connection from abdomen to lips

STAGE 3 - ANY PHRASE

- Basic Training Gesture
  - Produce the following phrases in sequence as follows:
    1. First, chant the phrase on the note _______.
    2. Then over-inflect it with an extreme forward focus, and
    3. Then finally repeat it as natural speech with a forward focus.
  - NOTE: Each phrase should be produced following the above sequence before moving on to the next phase.

STAGE 3 - ANY PHRASE (PHRASE LIST)

- All the girls were laughing.
- Get there before they close.
- Did you hear what she said.
- Come in and close the door.
- Are you going tonight?
- Put everything away.
- Come whenever you can.
- We heard that yesterday.
- The player broke his leg.
- The children went swimming.

STAGE 4 - PARAGRAPH READING

- Read a paragraph with phrase markers
  - Separate each phrase only by the natural inhalation of air
  - Exaggerate focus and then repeat with a more normal speech/voice production.
  - Repeat the above without phrase markers.

STAGE 5 - CONTROLLED CONVERSATION

- Practice forward speech placement in conversation.
- Do not permit glottal attacks.

STAGE 6 - ENVIRONMENTAL MANIPULATIONS

- Simulate actual speaking environments
- Tailor to client’s needs, occupation, etc
- Use background noise
- Leave the Tx room
STAGE 7 - EMOTIONAL MANIPULATIONS

- Use materials and topics that increasingly engage and challenge the client.

HOME PROGRAM

- Each week, the main focus of Tx is sent home with the client.
- Require 15-20 minute sessions, 2X day
- Provide recording of models / current productions from recent therapy session for support
  - Stretches
  - Basic gesture
  - Selected level for the week

RVT - ADDITIONAL THOUGHTS

- Often applied with VFEs
  - Train VFE protocol - Begin VFE home practice - After few weeks, initiate RVT program
- Has been discussed by some as a natural form of “amplification” for teachers and others using the voice professionally.

KEY EVIDENCE FOR RVT - CLINICAL STUDIES


KEY EVIDENCE FOR RVT - THEORETICAL / MODELING STUDIES


CASE 1 - RVT

ADULT NODULES

- 28 year old female teacher (2nd grade)
- Bilateral vocal nodules
- Symptoms
  - Roughness, Breathiness, Mildly reduced pitch
  - Difficulty projecting the voice
  - Vocal fatigue by end of day
CASE 2 - RVT

ADULT PARALYSIS
- UVFP - VF fixed near midline
- 57 year old female
- Concerns - lack of full closure, weak voice, breathy voice, few syllables/breath, mild stridor with exertion
- Goal - RVT produced with nearly adducted VFs; May benefit UVFP case with VF in median position; maximizes voice

CASE 3 - RVT

ADULT PRIMARY MUSCLE TENSION DYSPHONIA
- 42 year old male pastor
- Recent onset of dysphonia after upper respiratory infection
- URI resolved, rough voice, voice breaks, vocal strain remain (back-focused voice)
- Recent stroboscopy revealed severe muscle tension dysphonia

CASE STUDIES - ANALYSIS

- RVT
  - Achieved “most efficient” voicing (max output for min input) in all cases
  - Nodule case - reduced compression of and impact on the glottal edge; allowed healing
  - Paralysis case - shaped vocal tract to achieve best output from their given glottal configuration
  - MTD case - eliminated “pressed” voice and achieved maximal voice with a barely adducted VF posture; eliminated supra glottal compression; gave pastor natural “amplification”

GENESIS OF SOVT

- Vocal performance
  - Singers, Actors
  - Some date back to early to mid 1900s

WHAT IS A SEMI-OCCLUDED VOCAL TRACT?

- What is a semi-occluded vocal tract?
  - Vocal tract that is narrowed at any point
    - Epilaryngeal / pharyngeal narrowing
    - Tongue/palatal narrowing (voiced consonant production)
    - Lip narrowing (lip buzz, lip trills, etc)
- Why do it?
  - Stretch the vocal folds
  - Un-press the vocal folds
  - Use the vocal tract to help the folds vibrate

PHONATION WITH TUBES AND STRAWS
(SEMI-OCCLUDED VOCAL TRACT EXERCISES)

Kapsner-Smith et al., 2015
WHY A SEMI-OCCCLUDED VOCAL TRACT?

- Pertains to interactions between the acoustic signal and the vocal tract.
- When acoustic energy (sound wave) encounters a narrowing along the vocal tract some of the energy is redirected back down toward the source (the vocal folds).
- Creates a back-pressure and “un-presses” the vocal folds.

WHY A SEMI-OCCCLUDED VOCAL TRACT? - PHYSIOLOGIC BENEFIT

- Facilitates / Reinforces VF vibration
- Achieves most efficient glottal posture (Berry et al., 2001)
- Back pressures act upon the top of the vocal folds and keep them separated
- VF’s barely adducted / slightly abducted
- Lowers the threshold of phonation (PTP)
- “Massages” the vocal folds

WHY A SEMI-OCCCLUDED VOCAL TRACT - VOCAL BENEFITS

- Maximal output (greater loudness)
- Minimal input (reduced adduction, glottal impact)

FORMS OF SEMI-OCCCLUSION

- Various forms of semi-occlusion result in differing degrees of acoustic response.
- Can adjust shape of vocal tract (tongue position, megaphone vs inverted megaphone posture, etc)
- Can adjust length of vocal tract (lip protrusion, lowering larynx, use of straws and tubes)
- Can adjust epilaryngeal narrowing
- Can do combinations of above for additive effect

FOUNDATIONS OF SOVT

EXAMPLES OF SOVT

STEADY
- Straw phonation
- Humming
- Hand-Over-Mouth
- Vocal function exercises
- Resonant voice

FLUCTUATING
- LaxVox
- Lip trills
- Tongue trills
USES FOR PHONATION WITH TUBES AND STRAWS

- For those with disorders - A holistic Tx approach
- Can be used with functional or organic disorders
  - MTD
  - Nodules
  - Paralysis
  - Presbyphonia
  - Post-op re-introduction of voicing
  - Functional dysphonia (masks feedback and allows voicing)

- For those without voice disorders, offers solid voice care
  - Warm-ups and Cool-downs
  - Daily voice care for those using the voice professionally
  - Developing registers
  - Prevention of voice disorders
  - Daily “calibration” of voice; voice checks

SAMPLE PROTOCOL - STRAW PHONATION

PER KAPSNER-SMITH ET AL., 2015

- Pitch glide up and back down - 10 reps
- Accent exercises - create 5 to 7 “hills” of sound; varying pitch and loudness using breath support (and not adduction) - 10 reps
- Singing a melody through straw (melody but no words) - 10 short songs
- “Reading” through straw without articulation emphasize prosody - 5 medium length paragraphs (5-10 sentences each)

STRAW PHONATION - SAMPLE PROTOCOL

PER KAPSNER-SMITH ET AL.

- Reminders:
  - Ensure air flows only through the straw
  - Use abdomino-thoracic breathing
  - Relaxed upper body
  - Perform in full voice (but will sound softer)

STRAW PHONATION - SAMPLE PROTOCOL

PER KAPSNER-SMITH ET AL.

- Home Program
  - Complete 1 minute of each exercise
  - 4 x per day
  - Total of 4, 4-minute exercise times
  - Can give audio instructions (DVD, MP3, etc)

STRAW PHONATION - SAMPLE PROTOCOL

PER KAPSNER-SMITH ET AL.

- Tx once per week
- 30-60 minute sessions
- 6 sessions
- First session - training in exercises
- Remaining sessions - client performed exercises required # of times with clinician monitoring and providing feedback
LAX VOX - A RELATED PROGRAM

- Developed by Denizoglu and Shivo
- Laryngologist - SLP duo from Turkey and Finland, respectively

From: https://www.youtube.com/watch?v=xl08fySrD3o by Suhail Voice in Progress

CLINICAL AND THEORETICAL EVIDENCE FOR SOFT


KEY EVIDENCE FOR LAX VOX


CASE 1 - SOVT WITH TUBES AND STRAWS

PRESBYPHONIA

- 79 year old active male
- Moderate bowing of vocal fold edges; poor closure, breathy, weak voice
- Beginning to show evidence of hyperfunction above the vocal folds as compensation
- Goal - Improve vocal fold closure, vibration; maximize voice without compensation

CASE 2 - SOVT WITH TUBES AND STRAWS

POST-OPERATIVE CARE

- 45 year old female s/p removal of hemorrhagic polyp
- Hemorrhage event occurred after football game
- Scope 2 days post revealed hemorrhagic polyp - placed on voice rest
- Cyst surgically removed 6 days post-event
- Modified voice rest for week post-op
- Needed a re-introduction to voicing
MUSCLE TENSION IN A CHILD

- 5 year old male post airway reconstruction
- Folds mobile after reconstruction
- Child developed pattern of moderate-severe supraglottic tension post-operatively
- Goal of therapy - to reduce supraglottic hyperfunction, restore efficient, easy voicing, facilitate VF vibration

STRETCH AND FLOW (SnF)

- First described years ago
  - Stone and Casteel, Jackie Gartner-Schmidt
  - Recent research interest
  - Watts and colleagues (two recent studies)
- Also known as “Flow Phonation”
- Targets the hyperfunctional voice

S,F TENANTS

- Gain volitional control over the subsystems of speech
  - Develop better respiratory patterns
  - Coordinate respiration with laryngeal activity
  - Achieve proper resonance
  - Apply minimal muscle effort
- Emphasis on AIRFLOW with voiceless and voiced stimuli
- Move through hierarchy at each level
- Require 90% accuracy on 10 consecutive productions

PRELIMINARY STAGE

- Some begin with a phase of “bubbling”
- Ask client to release air through straw into water to generate a bubbling of the water.
- Achieves unrestricted airflow without phonation.

SKILL LEVEL 1 - FLOW

As described by Watts, Diviney, et al., 2015

- Goal: Obtain control over airflow
- Task: Release steady flow of air (no voice) through pursed lips - relaxed, no effort
- Stimulus:
  - “hooooo” - air only
- Should see forward movement of tissue held gently by patient
SKILL LEVEL 2 - STRETCH AND FLOW
STRETCH AND FLOW

• Goal - Release of relaxed, steady air (no voice) through glottis while performing slow, drawn-out (stretch) movements of articulators; minimal effort
• Tissue for visual feedback
• Stimulus
  • Vowels / vowel sequence
    ▸ whooaaahhhheeee
    ▸ gesture to show flow

SKILL LEVEL 3 - STRETCH AND VOICED FLOW
STRETCH AND FLOW

• Goal - Produce voiced airflow through glottis with slow, drawn-out (stretch) movements of articulators; minimal effort
• Production is an effortless, breathy voice
• Tissue for visual feedback
• Cue: “Half air…half voice”
• Stimuli:
  • Start at word level
  • Slowly increase phrase length
  • Work up to reading, dialogue

SKILL LEVEL 4 - REDUCED STRETCH WITH INCREASED FLOW

• Goal: Produce voiced airflow through glottis with a faster speech rate; minimal effort
• Hear effortless breathy voice at a normal speech rate
• Still hearing the voice amid air
  • “Voice plus air.”
• Stimuli:
  • Start at word level
  • Slowly increase phrase length
  • Work up to reading, dialogue

SKILL LEVEL 5- REDUCED AIR FLOW
REDUCED AIR FLOW

• Goal: Normal voice quality with normal rate of speech; maintain minimal effort
• Want non-breathy voice, normal rate, minimal effort
• Comfortable pitch
• Stimuli:
  • Start at word level
  • Slowly increase phrase length
  • Work up to reading, dialogue

SnF Hierarchy

SnF Literature

<table>
<thead>
<tr>
<th>Described</th>
<th>Studied</th>
</tr>
</thead>
</table>

N=8, one group pre-post
N=26, compared to control group
STRETCH AND FLOW - CLINICAL APPLICATION

- More specific in its application than previous methods covered.
- Designed for use with cases of hyperfunction (muscle tension)

CASE 1 - STRETCH AND FLOW

MUSCLE TENSION DYSPHONIA (MTD)

- 8 year old female
- Recently hospitalized; trach for short time
- When resumed voicing, significant ventricular fold movement
- Strobe showed normal laryngeal anatomy; normal abduction and adduction
- Voicing attempts very tight, limited airflow
- Not stimulable for improved voicing with cues
- Unable to achieve “hum.” Unable to approximate VFEs.

SPECIAL POPULATIONS

- Some populations may require:
  - non-physiologic methods
  - facilitation of (assistance in achieving) a new pattern of voicing
  - alternative plans for Tx scheduling

PRIMARY MTD

(per Roy in Stemple and Hapner’s Voice Therapy: Clinical Case Studies)

- May be due to a variety of sources:
  - Psychological or personality factors that yield increased tension in muscles surrounding the larynx
  - Misuse of the laryngeal mechanism secondary to high vocal demands
  - Learned patterns of misuse / tension after upper respiratory infections, etc
  - Increased tone in pharyngolaryngeal area secondary to reflux reflex
SECONDARY MTD

(Per Roy in Stemple and Hapner’s Voice Therapy: Clinical Case Studies)

- Pattern of muscle tension that is seen as co-occurring with or as a compensation for an underlying vocal fold condition or glottal insufficiency.

PRIMARY AND SECONDARY MTD

- Perceptually / Behaviorally
  - Severely dysphonic to aphoniac
  - A range of vocal features and severities
    - From severely breathy to severely pressed
    - Glottal fry
    - Whisper
    - High-pitched falsetto-like voicing
    - Diplophonia

- Physiologically
  - Perilaryngeal tension
    - Limits action of intrinsic muscles
    - Speaking “in a box” - limited flexibility
  - Patterns of tension on laryngeal exam (debated by some as diagnostic)
    - Along vocal fold edge
    - Ventricular compression
    - Anterior-posterior compression (epiglottis folds toward arytenoids)
    - Sphincteric closure

PRIMARY AND SECONDARY MTD

- Perceptually / Behaviorally...
  - See / hear tension and strain
  - May have muscle aching
  - A strong, consistent pattern of muscle tension
  - Unable to alter muscle patterns with simple prompting
  - Consequently - can’t begin with Tx protocol of VFEs, RVT, etc.

PRIMARY MTD - TREATMENT EXPECTATIONS

- Evidence indicates that symptomatic voice Tx methods can result in sudden and dramatic improvement in the voice.
- Few comparative studies
- A variety of methods applied by expert clinicians

TREATING PRIMARY MTD

- Generally requires facilitating technique(s) to break the tension pattern and facilitate a new pattern of muscle use
  - SLP must break the old pattern and facilitate the new
- Some classic facilitating techniques:
  - Yawn-Sigh
  - Chewing
  - Digital manipulation
  - Digital massage
  - Gargle
  - Rapid falsetto productions
- Newer facilitating methods - Stretch and Flow
TREATING PRIMARY MTD - PHYSIOLOGIC METHOD

- Manual Circumlaryngeal Techniques
  - Aaronson, Roy and colleagues
  - Considered among the Physiologic Therapies
  - Systematic massage and manipulation of the laryngeal complex
  - Massage slowly applied at various points from hyoid to superior aspect of thyroid cartilage
  - Massage slowly relaxes laryngeal muscles and lowers larynx in the neck
  - As larynx relaxes - Slowly introduce vocalization

TREATING PRIMARY MTD

- Manual Circumlaryngeal Technique
  - A carefully prescribed method - NOT a blind massage
  - Variants of the method now discussed
  - Recommend much reading and practice prior to application
  - CAUTIONS are noted by authors

TREATMENT PRIMARY MTD

ISSUES OF TREATMENT PLANNING

- Requires an atypical treatment plan
- See for long sessions, back-to-back days
- Does not respond well to dispersed treatment!
- Roy studies demonstrate return to normal voice on DAY 1
  - This should be the expectation
  - If does not return DAY 1, see for follow up in an extended session on NEXT DAY. (Boot Camp, Patel)

TREATMENT OF PRIMARY MTD - TIPS

- Achieve VF vibration with the above methods and slowly shape to voicing.
- Be careful in your use of the term “voice” and “voicing.”
- Do NOT over-react to positive movements toward voicing.
- Move slowly…back-up and repeat as needed.
- Avoid conversation or commenting during process - reverts back to errant muscle pattern.

EVIDENCE FOR MANUAL TECHNIQUES


NOTE: Variations of Roy’s manual methods also discussed and presented in the literature.
When it's time to change, you have to rearrange.

MUTATIONAL VOICE

- Male voice undergoes multiple changes at puberty
  - Vocal fold edge thickens, more squared edge
  - Vocal fold elongates
  - Larynx drops in neck
  - Full octave drop in matter of a few months
  - Must coordinate use of the new system…and accommodate to the new sound.

PHYSIOLOGY OF THE MUTATIONAL VOICE

- The mutational voice…
  - high pitch, breathy, voice breathy, weak, reduced intensity
- Physiologically…
  - THYROARYTENOID MUSCLE IS NOT ENGAGED!
  - vocal folds elongated
  - gap between folds
  - larynx high in the neck

TREATMENT OF MUTATIONAL VOICE

- Must engage the thyroarytenoid muscle
- Various methods:
  - Glottal attack
  - Throat clear
  - Grunt
  - Laugh
  - Digital manipulation / pressure
  - Sometimes…just ask for “the other voice.”

TREATMENT OF MUTATIONAL VOICE

ISSUES OF TREATMENT PLANNING

- Expect to establish the target voice DAY 1.
- Schedule for an initial long session (2-3 hours)
- If second session required, see on NEXT day.
- Will not respond to dispersed Tx sessions.

TREATMENT OF MUTATIONAL VOICE

ISSUES OF TREATMENT PLANNING

- Must introduce the new voice
- Remove the fear of speaking outside the session
- Plan:
  - Prepare family members in how to respond to the new voice.
  - Client identifies 1-2 people to use the voice with on first day.
  - Identifies 1 or 2 additional people (outside of home) to use new voice with on following day.
  - Generally by 3 or 4th day - consistent use of voice
IRRITABLE LARYNX SYNDROME

- Spectrum of disorders
- Term first coined by Morrison and Rammage, 1999

VCD
Laryngospasm

PARADOXICAL VOCAL CORD DYSFUNCTION

- Common Etiologies / Groupings
  - The adolescent PVCD syndrome
  - Conversion reaction PVCD
  - Laryngospasm - response to noxious stimuli
    - GERD/LPRD
    - Chemicals
    - Perfumes
    - Gasoline

ASSUMPTIONS IN PVCD TX

- Underlying causes must be addressed.
- Individuals are not aware of the laryngeal source of the problem.
- Individuals can bring larynx under volitional control.

PVCD TX

- Begin with patient education
  - Video of vocal folds - normal and paradoxical
  - Explain normal vocal fold movement
  - Get them to “buy into” therapy
  - Reassurance that the problem can be brought under control
LARYNGEAL CONTROL THERAPY FOR PVCD

Phase 1 - Get an open larynx
- Teach awareness of “sensations” at onset and laryngeal tightening
- Teach relaxed throat breathing
  - Jaw relaxed
  - Tongue tip behind front lower teeth; low in mouth
  - Lips gently closed
  - Feel the air flow in this posture

Phase 2
- Teach Lower Abdominal Breathing
- Teach Active Exhalation
  - Focus on exhaling “all” air
    - Sets up reflex which will abduct the folds widely
    - Client asked to actively exhale on S, SH, F or through rounded lips
    - At end of exhale - client relaxes and feels the passive flow of air in through the nose

Phase 2 (con’t)
- Practice active exhalation on various counts
  - Out for 4; in for 2
  - Out for 7; in for 3
- Practice active exhalation in a variety of activities (increasing complexity)

End Goal - client to use laryngeal control (relaxed throat, abdominal breathing, active exhalation) prior to and during an episode.
- Be aware of early (warning) sensations in the throat
- If sense a tightness, use laryngeal control methods
  - Use open throat breathing
  - Active exhalation - focus on exhalation; not inhalation
  - Listen for quiet breathing
- Practice in various activities; Hierarchy

OTHER METHODS FOR TREATING PVCD

- Biofeedback - some evidence emerging
- Inspiratory muscle training
- See Patel et al., 2015 - Review of PVCD Tx