A Step-by-Step Approach to Voice Treatment

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MUSC

What is a Voice Disorder?

- Anything that causes a persons voice to sound unnatural
- Anything that a person says is different with their voice or the effort that it takes to produce their voice
- Anything where a persons larynx or vocal folds does not look or move as it is supposed to which also causes a change in function

Common complaints

- Voice is hoarse
- Can't get loud
- Lose voice after speaking for a while
- Lost voice with a cold
- Voice changed after yelling
- I feel like my throat is closing in
- I can't sing high pitches

Main Types

- Anatomical Problems:
  - More tissue: Vocal fold lesions – bumps
  - Less tissue: Atrophy/bowing
  - Abnormal movement: Neurological
- Use Problems:
  - Post-cold/ bad habit
  - Trying to do something with your voice that it can not naturally do

More Tissue

- Cancer
- Nodules
- Polyps
- Cysts
- Granuloma
- Contact ulcer
- Papilloma
- Edema
- Reinke's Edema
- Hemmorhage

Problems with more tissue

- Vocal folds have more mass
  - Move slower (lower pitch)
- Vocal folds don't close well
  - Glottal gap (leak)
- Tissue mass is not the same on right and left
  - Creates asymmetry and hoarseness (noise)

How does more tissue sound

- Hoarse
- Strained
- Raspy
- Usually loud enough
- Slightly breathy / airy

Less Tissue

- Vocal fold bowing / atrophy
- Sulcus vocalis
- Vocal fold webs
- Post-surgery

Problems with less tissue

- Vocal folds have less mass
  - Move faster (higher pitch)
- Vocal folds don't close
  - Glottal gap (leak)
- Tissue mass isn't the same on the right and left
  - Asymmetry and hoarseness (noise)

How does less tissue sound

- Decreased loudness
- Breathy
- Hoarse
- Possible wet voice quality

Abnormal Movement

- Paralysis
- Paresis
- Spasmodic Dysphonia
- Tremor
- Dysarthria
- Paradoxical Vocal Fold Motion

Habit

- Post-cold voice maintained after cold has left
- Habit cough or throat clearing
- Habitual loud talking or yelling
- Puberphonia
- Conversion aphonia

Asking it to do something special

- Singers
- Actors
- Teachers
- Preachers
- Lawyers
- Children (noises)
- Transgender
- Everyone when they have a cold

Muscle Tension Dysphonia

- Can co-occur with all other voice problems
- A way for your body to compensate
- Ventricular fold compression and anterior-posterior compression

Interdisciplinary Voice Team

- SLP
- ENT
- Primary Care Physician
- Pulmonologist
- Gastroenterologist
- Vocal Coach
- Neurologist
- Oncologist
- Psychologist
- Social worker

Role of SLP and ENT

- SLP
  - Functional voice evaluation (Physiology)
  - Therapeutic intervention (Behavioral)
- ENT
  - Medical diagnosis (Anatomy)
  - Medical/Surgical intervention
- Must work together to understand and treat both anatomical and physiological concerns

ENT vs. SLP Evaluation & Treatment

ENT

- DX: ONLY evaluation that results in a medical diagnosis
- TX: Medical and surgical intervention approaches

SLP

- DX: Evaluation results in a functional assessment
- TX: Behavioral intervention approach

Components of a Non-Instrumental Voice Evaluation

- Review of Visualization Report and other Medical Records
- Case History
- Patient Self-Assessment
- Perceptual Judgment of Voice Quality
- Stimulability

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- **STATEMENT 8A. LARYNGOSCOPY PRIOR TO VOICE THERAPY:**
- **Clinicians should visualize the larynx before prescribing voice therapy and document/communicate the results to the speech-language pathologist.**
- *Recommendation based on observational studies showing benefit and a preponderance of benefit over harm.*

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- **STATEMENT 8B. ADVOCATING FOR VOICE THERAPY:**
- **Clinicians should advocate voice therapy for patients diagnosed with hoarseness (dysphonia) that reduces voice-related QOL.**
- *Strong recommendation based on systematic reviews and randomized trials with a preponderance of benefit over harm.*

Step 1: Stop the Bad

- Harmful Voice Use
  - Loud, Frequent Voice Use
- Harmful Medical Conditions
  - Reflux, Coughing and Clearing Secondary to a Cold/Allergies/Asthma

How to…

- Explain why you want to change their behavior!
- Give them steps and a monitoring system for the change

Vocal Abuse

- Increased loudness
- Prolonged talking
- Yelling, screaming, and shouting
- Excessive laughing or crying
- Imitation of animal or mechanical sounds
- Grunting during weight lifting

Vocal Misuse

- Using pitch that is inappropriate based on age and gender
- Inadequate breath support
- Decreased intonation
- Singing outside of range
- Talking through a upper respiratory infection or cold
- Production of character voices
- Speaking under stress or when tired

Vocal Abuse and Misuse: Loudness and Extent of Voice Use



- Monitor and reduce, if needed, the volume and extent of talking
- Do not speak over noise
- Use amplification if needed
- Take periodic 15-minute voice rests during the day, especially when you have an upper respiratory infection

Why monitor loudness and extent of voice use?

- Excessive loudness is a result of increasing the speed in which the vocal folds close and maintaining the closure for a longer duration through increased medial compression
  - This causes the force applied to the vocal fold mucosa to increase, which can lead to edema
- Excessive voice use, particularly during periods of upper respiratory infection or decreased hydration, can also lead to vocal fold edema

Vocal Hygiene: Reduce Harmful Non-Voice Acts

- Instead of coughing or throat clearing try to:
  - Take a small sip of water,
  - Swallow without water, or
  - Produce a silent cough

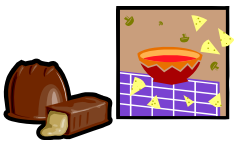
Why reduce coughing and throat clearing?

- Coughing and throat clearing behaviors slam the vocal folds and posterior laryngeal cartilages together and can lead to injury
- These behaviors also cause the ventricular folds to squeeze tightly, which is a behavior related to vocal hyperfunction
- Throat clearing may be a result of trying to clear a sensation caused by a laryngeal pathology, such as edema or a lesion

Why reduce coughing and throat clearing?

- Chronic coughing and throat clearing cause the vocal fold mucosa to forcefully meet midline, which in turn causes an increased secretion of mucous by the ducts immediately superior to the vocal folds
- This becomes a harmful self-perpetuating cycle

Vocal Hygiene: Control Reflux and Sinus Drainage




- Make dietary and lifestyle modifications
- Take appropriate medications to regulate the influence of reflux and sinus drainage

Why control reflux and sinus drainage?

- Laryngopharyngeal reflux (LPR), a superior extension of Gastroesophageal reflux disease (GERD) may cause acid to spill over from the esophagus to the larynx posteriorly
- Reflux is a causal factor for hoarseness, throat clearing, contact ulcers, laryngitis, and granulomas
- Sinus drainage leads to coughing and throat clearing

Medical Treatment of LPR

- Prescription of proton pump inhibitors (PPI) which reduce acid produced in the GI tract
- PPI: Prilosec, Nexium, Prevacid, Aciphex, and Protonix
- May take 1 ½ to 3 months for signs of improvement
- If no change after 3 months, refer patient back to physician

Dietary Modifications

Reduce:

- Caffeine, Alcohol, Carbonated beverages, Citrus fruits, Foods with high acidic content (tomato-based), Spicy foods, Mint, Menthol, Onions, Fatty food, and Chocolate
- Be aware that asking someone to eliminate all of these from their diet is overwhelming; consuming these foods in moderation is usually acceptable

Lifestyle Modifications

- Stop smoking
- Elevate head of bed 4 to 6 inches, with large wedge or blocks under legs of bed
- Lose excess weight
- Avoid tight clothing
- Exercise, but avoid weight lifting
- Avoid eating 1 to 2 hours before going to bed
- Avoid overeating
- Decrease stress

Vocal Hygiene: Check Medications

- Review the:
  - interactions,
  - contraindications, and
  - possible impact of your medications on vocal quality

Medications that affect the voice

- **Antihistamines**, such as those in allergy/sinus medications, may dry the vocal fold mucosa
- **Inhalers** act as irritants
- **Anti-inflammatory** drugs (such as Aspirin and Advil) increase risk for hemorrhage (esp. in singers)
- **Diuretics** are drying agents
- Certain **heart medications** decrease sensitivity to vocal strain

Medications

- Be aware that if medications are taken to relieve symptoms of allergies or colds, he medications may desensitize the tissue and diminish the patient's knowledge of pain associated with worsening of vocal pathology
- Especially true for singers and persons using excessively loud voice

Vocal Hygiene: Avoid Environmental Irritants

- Environmental Irritants
  - Allergens
  - Smoke
  - Chemical fumes

Why avoid environmental irritants?

- These can cause erythema (redness), edema (swelling), and general inflammation
- Smoking can cause laryngeal cancer and Reinke's edema (vocal fold swelling)

Step 2: Voice Exercises

- To promote good voice use, you must teach them how to use their voice in a healthy way
- Forward-focused Voice
  - Rationale
  - Method
- Laryngeal Relaxers
  - Trills
  - Yawn Sigh

Forward-Focused Voice

- Rationale – Use your vocal tract resonances to improve the quality of your voice instead of working harder from the larynx
- Helps with hyperfunctional disorders because it decreases the degree of compression and subglottal pressure needed to vibrate the vocal folds

Forward-Focused Voice

- Helps with hypofunctional disorders because it goes along with the state of the anatomy which is characterized by a decreased degree of compression

Forward-Focused Voice

Accurate production of forward focused voice occurs when …

1) voice quality is improved,
2) the patient feels the vibration/sensation in the front of their mouth, and
3) the patient feels that there is less tension in their throat.

Forward-Focused Voice: Step 1

- Breath in
- Touch lips together lightly
- Exhale on a hum (mmm)
- Feel a light vibration on your lips
- Stop humming once you feel the vibration
- This is NOT an extension exercise! Those increase laryngeal tension.

Practice

- mmmmm

Forward-Focused Voice: Step 2

- Breath in
- Touch lips together lightly
- Exhale on a hum (mmm)
- Feel a light vibration on your lips
- Exhale on a vowel (e, ah, ay, ou, oo)
- Feel a light vibration for the vowel
- Stop once you feel the vibration

Forward-Focused Voice: Step 2

- Make sure that the vowel sound is being made in the very front of your mouth.
- For the “ah” and “ay” sounds, you should feel vibration/sensation on the roof of your mouth behind your front teeth.
- For the “ou” and “oo” sounds, you should feel vibration/sensation on your rounded lips.

Practice

- mmmmm + eeeeeeeee (me, as in not you but)
- mmmmm + aaaaaaaah (ma, as in ma and pa)
- mmmmm + aaaaaaaay (may, as in the month)
- mmmmm + ooooooooow (mow, mow the lawn)
- mmmmm + ooooooooo (moo, like a cow)

Forward-Focused Homework

Voice Evaluation Session Stage 1:
- Implement vocal hygiene changes.
- Step 1 at least 5 times per day with 5 trials each time (5 “mmmm”, 5x/day).

Voice Therapy Stage 2:
- Continue to implement vocal hygiene changes.
- Step 1 at least 3 times per day with 3 trials each time (3 “mmmm”, 3x/day).
- Step 2, 3 times per day with 5 trials each time (5 “mmmm + vowel”, 3x/day).

Forward-Focused Voice: Step 3

- Step 2 plus
- Say the remainder of the word while feeling vibration/sensation on all voiced sounds.
- Make all voiceless sounds softly (p, t, k, s, f, h, x, ch, sh, th)
- Stop once you feel the vibration

Practice

- Mom
- Mime
- Men
- Moon
- Meet
- Mare
- Mad
- Mink
- Match
- Mall
- Move
- Must
- Mile
- Mix

Forward-Focused Practice: Voice Therapy Stage 3

- Step 1 at least 3 times per day with 3 trials each time (3 “mmmm”, 3x/day).
- Step 2, 3 times per day with 2 trials each time (2 “mmmm + vowel”, 3x/day).
- Step 3, 3 times per day with 20 words each time (20 “mmmm + 1 syllable word”, 3x/day).

Forward-Focused Voice: Step 4

- Step 3 plus an additional syllable
- Say the entire word while feeling vibration/sensation on all voiced sounds.
- Make all voiceless sounds softly (p, t, k, s, f, h, x, ch, sh, th)
- Stop once you feel the vibration

Practice

- Memo
- Money
- Monday
- Modern
- Morning
- Mover
- Muffin
- Master
- Measure
- Marine
- Motion
- Message
- Mitten
- Mushroom

Forward-Focused Practice: Voice Therapy Stage 4

- Step 1 at least 3 times per day with 3 trials each time (3 “mmmm”, 3x/day).
- Step 2, 3 times per day with 2 trials each time (2 “mmmm + vowel”, 3x/day).
- Step 3, 3 times per day with 5 words each time (5 “mmmm + 1 syllable word”, 3x/day).
- Step 4, 3 times per day with 20 words each time (20 “mmmm + 2 syllable word”, 3x/day).

Forward-Focused Voice: Step 5

- Step 4 plus an additional syllable or two
- Say the entire word while feeling vibration/sensation on all voiced sounds.
- Make all voiceless sounds softly (p, t, k, s, f, h, x, ch, sh, th)
- Stop once you feel the vibration

Practice

- Manpower
- Marinade
- Mummify
- Military
- Multiply
- Moreover
- Minority
- Motherhood
- Marshmallow
- Mathematics
- Manufacture
- Monumental
- Meaningless
- Mountaineer

Forward-Focused Practice: Voice Therapy Stage 5

- Step 1 at least 3 times per day with 3 trials each time (3 “mmmm”, 3x/day).
- Step 2, 3 times per day with 2 trials each time (2 “mmmm + vowel”, 3x/day).
- Step 3, 3 times per day with 5 words each time (5 “mmmm + 1 syllable word”, 3x/day).
- Step 4, 3 times per day with 5 words each time (5 “mmmm + 2 syllable word”, 3x/day).
- Step 5, 3 times per day with 20 words each time (20 “mmmm + 3+ syllable word”, 3x/day).

Forward-Focused Voice: Step 6

- Use the same techniques as in Step 5
- Apply the techniques to all of the words in the sentences
- Take breaths whenever needed

Practice

- Military men march.
- Movies make millions.
- Merlin mastered magic.
- Mountaineers are manly.
- Motel members save much money.
- Manatees are marooned in muddy waters.
- Mothers earn medals for mastering morning marathons.

Forward-Focused Practice: Voice Therapy Stage 6

- Step 1 at least 3 times per day with 3 trials each time (3 "mmmm", 3x/day).
- Step 2, 3 times per day with 2 trials each time (2 "mmmm + vowel", 3x/day).
- Step 3, 3 times per day with 5 words each time (5 "mmmm + 1 syllable word", 3x/day).
- Step 4, 3 times per day with 5 words each time (5 "mmmm + 2 syllable word", 3x/day).
- Step 5, 3 times per day with 5 words each time (5 "mmmm + 2 syllable word", 3x/day).
- Step 6, 3 times per day with 10 sentences each time (4 short sentences, 3 medium sentences, and 3 longer sentences, 3x/day).

Laryngeal Relaxers

- Trills = tongue trills and lip trills
  - Tongue trills = Spanish 'r'
  - Lip trills = Baby's raspberry
  - Both types of trills can be done on one note and on glides
- Yawn sign = yawn and sigh
  - You can start with just the yawn for very tight or aphonic patients (get the air moving in the right direction)

Optional Steps

- Breath Support
- Hydration
- Vocal Function Exercises

Vocal Hygiene: Increase Hydration

- Systemic
  - Drink more water
  - Recommendations are between 64 to 80 ounces per day
- Topical
  - Humidification

Why increase hydration?

- There is a natural thin layer of mucous that covers the respiratory tract
- When there is systemic dehydration, this mucous becomes thicker, acts like glue, and impedes phonation
- This causes the person to put more effort into typical speech acts

Vocal Hygiene: Limit Caffeine and Alcohol

- Drink an extra 8 oz of water to compensate for each glass of caffeinated or alcoholic beverages that you drink

Why limit caffeine and alcohol?

- **Caffeine** and **alcohol** are diuretics, which cause fluids to pass from the body before hydrating the tissues
- **Caffeine** stimulates the CNS, reducing the impact of 'relaxation' therapeutic strategies and aggravating reflux
- **Alcohol** reduces fine motor coordination and sensation, increasing the chance of speaking with slight laryngeal pain

Vocal Function Exercises

- Used with patients who have both hyper- and hypo-functional voice disorders
- Goal is to provide muscle stretching through pitch glides and singing scales, and muscle strengthening through sustained phonation
- MUST have resonant voice and good breath support BEFORE starting these exercises!!!

Vocal Function Exercises

1. Sustain /i/ for as long as possible on the note F above middle C (F below middle C for men)
2. Glide from lowest note to highest note on the word "knoll"

Vocal Function Exercises

3. Glide from your highest note to your lowest note on the word "knoll"
4. Sustain the musical notes (C-D-E-F-G) for as long as possible on "oll" (knoll without the kn)

Vocal Function Exercises

- Goal for sustained phonations is to equal longest sustainable /s/ with a forward focused voice quality and as softly as possible (not whispered or breathy)
- Goal for "knoll" is to go through the glide without pitch breaks, with forward focus and rounded lips

Special Cases

- After Surgery
- After a Hemorrhage
- Spasmodic Dysphonia
- Tremor
- Paradoxical Vocal Fold Motion

After Surgery to Vocal Folds

- Voice Rest
  - Talking, Coughing, Laughing, Whispering
- Monitoring of Vocal Fold Healing via visualization
- First voice use with SLP
- Ease into voice with Forward Focused Exercises

After Surgery that Resulted in Voice Complaint

- Disorder due to vocal fold tissue damage
  - Intubation injury
  - Treat as post-surgery case
- Disorder due to nerve damage
  - Nerve injury during a surgery of the neck or chest
  - Improve vocal function with behavioral treatment in concert with appropriate surgical injection medialization
  - Wait to assess natural healing of the nerve

After Hemorrhage

- Stop taking blood-thinning medication
- Voice rest
- Frequent rechecks of vocal fold tissue
- Ease into voice use similar to post-surgical case

Spasmodic Dysphonia

- Behavioral therapy in concert with medical/surgical intervention (lit supported)
- Usually behavioral therapy alone is NOT sufficient

Tremor

- Focus on easing the muscle tension
- No established method
- Not well studied
- Constantly requires a lot of effort from the patient

4 Tremor Reducing Tips

1. Speak with better breath support
2. Speak quickly
3. Speak at a high pitch
4. Speak quietly

Speak with better breath support

- Sufficient breath support to drive the vocal folds prevents the intrinsic laryngeal muscles from working harder to increase medial compression.

Speak quickly

- Speaking quickly causes the vowels to be shortened which reduces the percent of time that tremor can be apparent in speech.

Speak at a high pitch

- Speaking at a high pitch allows the effort of phonation to be shared between the TA and CT muscles, reducing the workload on the TA, and minimizing the perception of tremor.

PVFM

Treatment Plan:

- Patient Education
- Supportive Counseling
- Instruction in tension identification and control
- Instruction in relaxed-throat breathing

Adapted from Mathers-Schmidt, B. A. (2001). Paradoxical vocal fold motion: a tutorial on a complex disorder and the speech-language pathologist's role. *American Journal of Speech-Language Pathology*, 10, 111-125.

PVFM: Patient Education

- Review assessment results, focus normality of respiratory and phonatory anatomy and physiology without devaluing Pt. complaints/symptoms
- Educate patient as to normal respiratory and phonatory function and their inter-related role
- Review PVFM symptoms and contrast with normal

PVFM: Supportive Counseling

- Acknowledge patient's fears and the feeling of inability to control respiration during an attack
- Discuss possible triggers for attacks
- Discuss how you will teach patient techniques to use, which you hope they will eventually use is situations when attacks are likely to occur

PVFM: Tension Control

- Progressive relaxation of relevant muscle groups
- Skill Level 1: Maximally tighten, hold, feel tension, release, feel difference between tensed and relaxed musculature
- Skill Level 2: Same as above but with moderate tension
- Skill Level 3: Do not tighten but be aware of muscle tension

PVFM: Tension Control

- eyebrow lift
- eyebrow furrow
- jaw (bite)
- lips purse/press together
- tongue (back and up to alveolar ridge)
- neck (pull head back and down slightly)
- shoulder lift
- larynx (breath, hold, bear down)
- inhalatory muscles (max inhale and hold)
- tighten abdominal muscles

PVFM: Tension Control

- Pt. should practice each level outside of the clinic, once it is mastered under clinician guidance
- Goal: Pt. will be able to identify and reduce excessive tension associated with respiration during a variety of activities in a variety of settings.
- Allows patient to use easier breathing before an acute PVFM episode occurs

PVFM: Relaxed-Throat Breathing

- Focus attention away from larynx and towards diaphragmatic breathing during inhalation
- Should begin working on this goal by assessing and releasing tension
- Breathing practice for awareness and control of inhalation and exhalation

PVFM: Relaxed-Throat Breathing

- Inhalation: " Breathe through your nose, with your tongue resting on the floor of your mouth , and your lips gently together. Allow expansion in the lower ribcage and abdominal area."
- Use tactile cues to promote awareness of expansion

PVFM: Relaxed-Throat Breathing

- Exhalation: "Let the air out with a hissing sound or gently prolonged /s/."
- Focus on passive exhalation, not on inhalation
- Pt. counts silently and works to increase exhalation
- "Breathing this way allows the body to work the way it wants to."