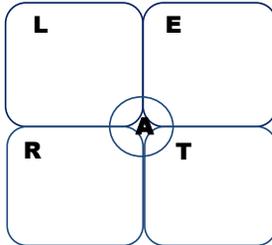
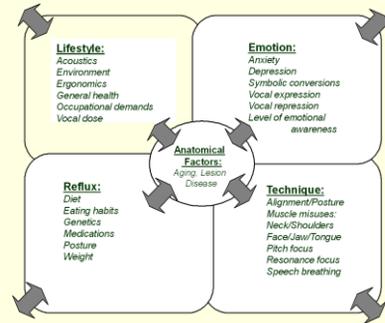


Always remember....



Voice Therapy in Individuals with Anatomically-Based Voice Dysfunction



Common A profiles

- Lesions: 1^o or 2^o ?
- Stiff/scarred vocal folds / sulcus
- Dysarthrias: flaccid vocal fold paralysis
spastic dysarthria
hypokinetic (PD)
hyperkinetic (EVT, SD)
- Transgender dysphoria
- Geriatric considerations

Therapy as 1^o R_x Modality:

1. to reduce causative factors & improve voice function: eg, bilateral vocal fold nodules
2. to minimize effects of lesions or diseases & optimize voice function: eg, sulcus vocalis; vocal cord scarring; vocal paresis; dysarthrias

Sulcus Vocalis

- 1^o complaints: high pitch, weak voice, harsh-breathy quality
- 1^o signs: ↓vocal cord closure (bowed); stiffness, ↓mucosal wave
- Long-standing negative compensatory muscle misuse?
- If not, symptomatic therapy can focus on optimizing closure
- Similar strategies to v.fold scarring

Flaccid Dysarthria: Vocal Fold Paralysis

- Forced adduction exercises have been advocated: don't use during spontaneous recovery, or if other augmentation procedures planned
- Best closure is at lower pitch
- Best closure/quality is at "quiet"
- Posture changes may facilitate closure
- Vocal amplification may be required

Hypokinetic Dysarthria: Parkinson's

- LSVT™ ("get loud") for increasing loudness and vocal dynamics. May include forced adduction

Or:

- Coordinated voice onset/sigh onset to reduce rigidity. CVO may improve vocal fold closure. Sigh may improve flow.
- Other/combined vocalization approaches: Group Singing (Tanner, Rammage & Liu, submitted)

Hyperkinetic Dysarthria- Add. SD

- Usually best with comprehensive Rx
- CVO : lowered lung volume reduces hyper-adducting responses
- Resonance practice changes feedback. Passive jaw and tongue movements reduce pull on lx
- Inhalation therapy (?) difficult to transfer
- Pitch/Register therapy or singing/chanting mode may increase fluency.
- Increase pitch to minimize tremor: vocal SIREN
- Commit to a long-term relationship!

Hyperkinetic Dysarthria - EVT

- increase pitch: 50 Hz (Dworkin and Meleca, 1999)
- decrease intensity / laryngeal effort
- chanting and stabilizing the larynx manually or with an elastic neckband (Dworkin and Meleca, 1999)
- combined therapy program (Barkmeier-Kraemer et al, 2011):
 - training in relaxation/breathing;
 - increase speaking rate to reduce voiced segment durations
 - increase f_0 and upward phrase-end inflections
 - use breathiness to reduce vocal intensity and v. fold adduction
 - anterior facial resonance with 'open' throat.

Transgender Voice Therapy (m→f)

- ↑ f_0 above 160 Hz: target 180Hz and 200 Hz
- ↑ formant frequencies (elevate lx, retract lips)
- alter intonation patterns
- reduce speaking intensity
- ↑ breathiness
- adopt feminine syntax, vocabulary, articulation, gestures. (Gelfer, 1999; Mayer and Gelfer, 2008; Soderpalm et al, 2004)
- time voice therapy to optimize phonosurgery results, psycho-social adjustments

Geriatric considerations

- counsel re expected aging changes
- consider hearing, other communication challenges
- optimize communication strategies
- remember hydration!
- extinguish mal-adaptive muscle misuses that reflect attempts to maintain previous f_0
- optimize vocal fold adduction: semi-occluded vocal tract tactics; resonance enhancement; LSVT LOUD™
- time Tx to optimize medical/surgical techniques (eg. vocal fold augmentation)

ALERT: Psychogenic Voice Dysfunction

- When to initiate therapy?
- What client education is required?
- How to address emotional factors?
- Role of feedback during therapy?
- How to recognize inappropriate R's?
- When to refer to mental health professional?

Conversion Aphonia/Dysphonia

- Evaluate psychological gain factors
- Education: demonstrate potential for normal function
- Reassure: no CA; voice will return
- Review facilitation techniques that helped: cough; humming; "um hm"; fry; inhalation; pushing; sighing; pitch Δ ; CVO; jaw; tongue; posture Δ
- Choose, extend, persevere!
- Put the patient in charge. Reassure!

Psychological Interference

- reduced motivation
- inappropriate response to a demonstrated voice improvement
- recurrence of dysphonia following normal voice recovery
- persistent signs of anxiety, depression, or psychological conflict
- request by client for a mental health referral
(Rammage et al, 2001)

Irritable Larynx Syndrome (Morrison, Rammage, Emami, 1999)

hyperkinetic laryngeal dysfunction
(laryngospasm-PVFM, cough, dysphonia/globus)

due to

CNS over-reaction to normal sensory
stimuli

in response to a

definitive triggering stimulus

Central Sensitization

- A defined input, or sensory stimulus, produces a sensory experience greater in amplitude and duration than would be expected
- The sensitivity of the pain system is shifted such that normally innocuous inputs can activate it & perceptual responses to noxious inputs are exaggerated, prolonged & widely spread
- This could represent a central amplification due to increased excitation or reduced inhibition

Amygdala: both enhances & inhibits pain processing

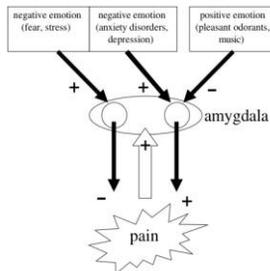


Fig. 10. Pain, emotions, and the amygdala: a hypothetical model. Negative affective states are generally associated with increased amygdala activity, whereas positive emotions have been shown to deactivate the amygdala. The amygdala is linked to both facilitatory and inhibitory pathways to modulate pain. Pain in turn enhances amygdala activity. Negative emotions associated with pain reduction (fear and stress) would activate amygdala-linked inhibitory control systems, whereas negative affective states that correlate with increased pain (depression and anxiety disorders) would activate pain-facilitating pathways. Positive emotions inhibit amygdala coupling to pain facilitation.

Neugebauer et al. Amygdala & Persistent Pain. *Neuroscientist*. 2004 10: 221-234.

3-Level treatment for ILS as CSS

Minimize Triggering Stimuli External & Internal
 ID Triggers
 Maximize Reflux Management!
 Maximize Compliance

Re-Program the Laryngeal Motor Responses

Desensitize
 Motor Re-learning

Re-Program the Central System

Centrally Active Medications

Minimize Triggering Stimuli External & Internal

Explain the Reflux Reflex

- Irritability induced by gastroesophageal reflux may be due to:
 Direct esophago-laryngeal reflex pathway
 or
 Laryngeal exposure to refluxate.
- Asthma-like reactions in parasympathetic laryngeal muscle system comparable to bronchial responses in "true" asthma.
- Many pharyngeal/laryngeal symptoms result

(Gill & Morrison, *J Otol*, 1998)

Minimize Triggering Stimuli External & Internal

Maximize Compliance

- ID sensory triggers in (external and internal) environment
- May need to modify environment and/or behaviours initially to minimize exposure to triggers
- Use multi-modalities to maximize reflux Rx compliance (eg. "But Doctor..." www.pvcrp.com)

3-Level treatment for ILS as CSS

Minimize Triggering Stimuli External & Internal

- ID Triggers
- Maximize Reflux Management!
- Maximize Compliance

Re-Program the Laryngeal Motor Responses

- Desensitize
- Motor Re-learning

Re-Program the Central System

- Centrally Active Medications

Re-Program the Laryngeal Motor Responses

Desensitize
Motor Re-learning

Tone-down para-laryngeal tension

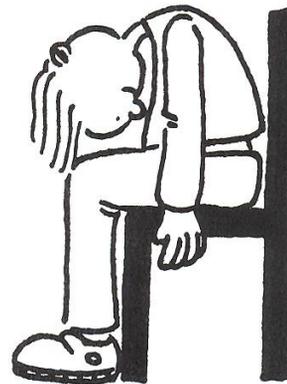
- Suprahyoids
- Thyrohyoids
- Pharyngeals

Re-Program the Laryngeal Motor Responses

Desensitize
Motor Re-learning

Specific Techniques - PVFM

- Postural change (eg. drop head forward)
- Back/abdominal breathing
- Sniffing
- Pursed lips breathing (Blager, 2002)
- Yawning (into pharynx, not jaw!)
- Relaxed breathing with jaw relaxed, tongue forward, suprahyoids neutral
- Prolonged 'sssss' (Mathers-Schmidt, 2004)
- Activity-based breathing (eg. Athletes)



Specific Techniques – Cough/Throat-Clearing (Zelazni, CASLPA, 2013)

- Ice chips
- Cold/hot water
- Hard candy (sugar-free)
- Swallow
- Count to 5
- Sniff in, pursed lips/"sssss..." out
- Walk, jump, skip, dance...

3-pronged treatment for ILS as CSS

Minimize Triggering Stimuli External & Internal

- ID Triggers
- Maximize Reflux Management!
- Maximize Compliance

Re-Program the Laryngeal Motor Responses

- Desensitize
- Motor Re-learning

Re-Program the Central System

- Centrally Active Medications

Re-Program the Central System
Centrally Active Medications

Pharmaceutical/Chemical Rx

- From Chronic Pain literature:
 - SSRI antidepressants
 - Tricyclic antidepressants (side effect dry mouth)
 - Baclofen, (centrally acting anti-spasmodic)
 - Gabapentin (antiepileptic)
- Botox
- Exercise (Endorphins!)

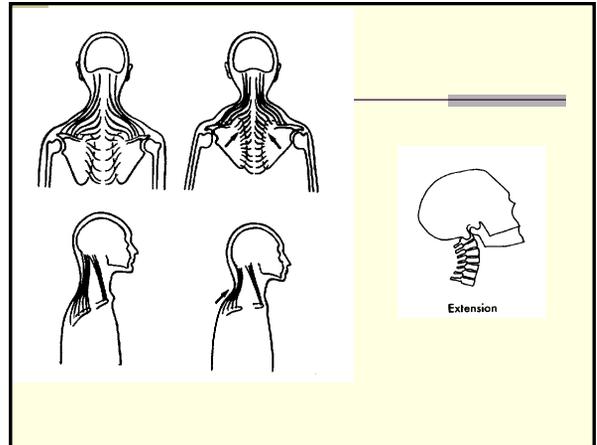
Re-Program the Central System

Emotional Factors

- May need to recognize links between sensory triggers and psychological events
Eg. Olfactory memories triggering Sx
- May need to recognize/manage emotional awareness level
- Address psychological factors at current level of emotional awareness (eg. physical Sx)

ILS: Clinical Example

- 32 year old single female seen with sudden onset of intermittent "choking", inspiratory stridor, triggered by perfume, disinfectants. PVFM triggered by FEEV, otherwise normal Ix. Poor posture: head retraction, jaw jut, adducted scapulae.
- Sx started shortly after foster mother's death. (Aged 12, ran away from family of origin and strict, fundamentalist religious commune. Possible sexual abuse, but no conscious memory...)
- (Foster) mother was loving, but had increasing Sx from congestive heart failure.



Emotional Awareness

- One week prior to mother's death, a friend suggested death imminent; Pt. briefly experienced sadness (Level 3)
- After death, no experience of sadness
- Onset of Throat Sx (Level 1)
- Emotional development arrested?

Psychological factors....

- Childhood background indicates (likely) lack of secure attachments to caregivers in family of origin = compromised development of affect regulation pathway (orbitofrontal → limbic system)
- As a result, experiencing emotions overwhelming for her as she is unable to process affect; instead, she develops an avoidant pattern and consciously/unconsciously shifts attention away from attending to emotion = low emotional awareness

Management Approach

- Psychotherapy:
- Develop therapeutic alliance: trusting, secure attachment with therapist
- Give her tools to tolerate emotional distress: breathing exercises, relaxation strategies, mindfulness exercises
- Help her develop the emotion processing pathway:
 - Mindfulness: bring awareness to the physical experience of emotions (level 1)
 - Help identify & label emotions (level 3 +); dialectical behaviour therapy can be useful here

“Physical” Therapy (SLP):

- Explanation of mechanism involved in paradoxical laryngeal movements and paradox with normal phonation
- Relaxed breathing awareness during postural changes: supine; head and torso dropped forward; “back breathing”
- Postural awareness: head-neck release; extinguish jaw jut during inspiration
- Vocal fold abduction activities with FNPLS biofeedback (sniffing; relaxed inspiration focusing on movement in back)