

LAX VOX

VOICE THERAPY TECHNIQUE

Marketta Sihvo, PhD

Speech Pathologist
Phoniatic Department of
Tampere University Hospital
Tampere, Finland

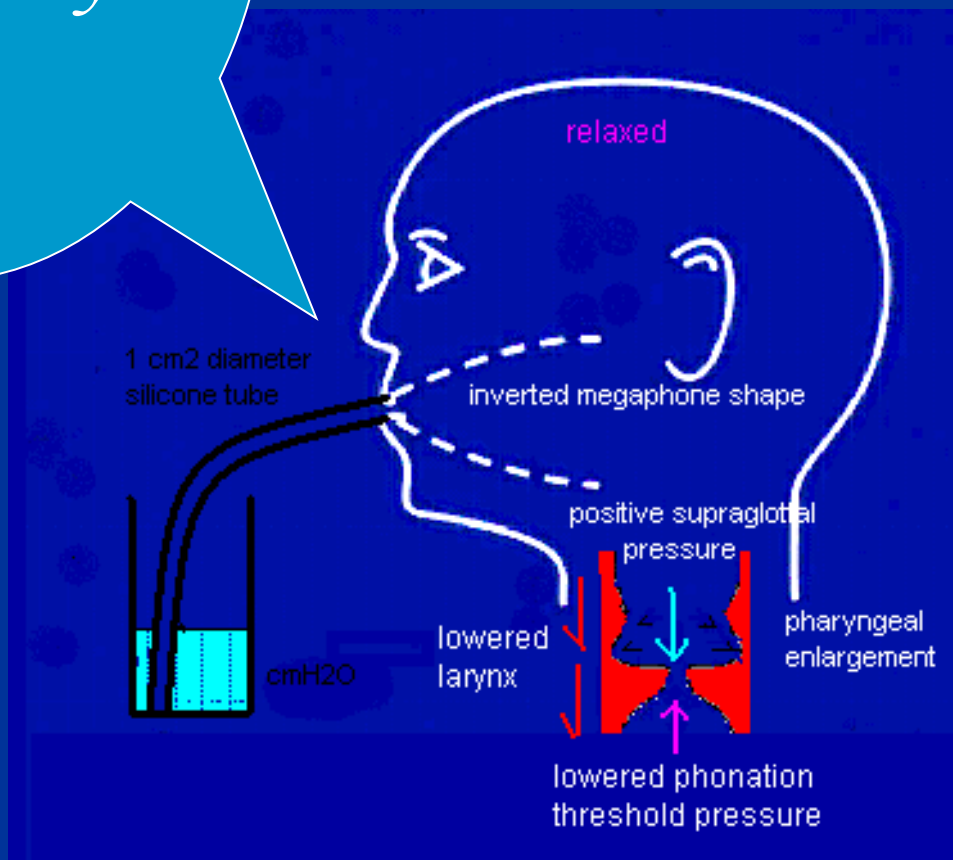
İlter Denizoglu, MD

Otolaryngologist
Alsancak State Hospital
Department of Otolaryngology
Unit of Phoniatics
Izmir, Turkey



/hhoo hho
hhooo hhooo
hhooo
hhoooooo/

*(happy birthday to
you)*



Form follows function

(Sullivan – American architect)

Voice therapy is any kind of technique that changes voice in a behavioral way. As Aronson mentioned " Voice therapy may be defined as an effort to return the voice to a level of adequacy that can be realistically achieved and that will satisfy the patient's occupational and social needs".

Traditionally voice therapy includes exercises for: **Posture, Relaxation, Breathing, Vocalizing, Articulation.**

The main aim of all voice therapies is a target voice. Target voice is the best possible voice within the patient's anatomic and physiologic capabilities.

To change the voice, it is essential to know how it works. Microphysiology clues lie between the two striking zones (in other words, vocal activation zone) of the vocal folds. Simply and very briefly, 'optimal dominant vibration point replacement' takes place in therapy procedures. Anatomically, this point (or place) is the best place for maximum elasticity and power. Also it is the place which shows maximal resistance to trauma.

Normal voice has five properties;

-Loudness

-Hygiene

-Flexibility

-Representability

-Pleasantness

Voice disorders, can be classified from four different standpoints:

A. Etiopathogenetic:

- 1.Functional
- 2.Organic
- 3.Neurogenic

B. Behavioral:

- 1.Hyperfunctional
- 2.Hypofunctional
- 3.Dysfunctional

C. Physiopathological:

- 1.Respiration
- 2.Phonation
- 3.Resonance

D. Perceptual:

- 1.Loudness
- 2.Pitch
- 3.Resonance
- 4.Timbre

E. Mathematical:

- 1.Hypodimensional
- 2.Eudimensional
- 3.Hyperdimensional

For every voice patient, all classifications must be used: there's no illness, but there is patient!

Voice Therapy Techniques

INDIRECT TECHNIQUES

Voice rest

- Absolute
- Modified

Vocal hygiene

- Elimination of mechanic trauma

- Hydration- humidification
- LPR
- Irritant inhalation

Breath support

- Abdominodiaphragmatic respiration
- Schlaffhorst Andersen Method

- Breathing coordination approach (Stough)
- Prosody

Posture

- Alexander
- Feldenkrais
- Yoga, Qi gong

Relaxation

- Progressive relaxation
- Reciprocal Inhibition
- Stretching exercises
- Open throat
- Imagination

Conscious Medical

Hypnosis

Acupuncture-

acupressure

Psychotherapy

Biofeedback

- Visual
- Auditory
- Kinesthetic

Phytotherapy

DIRECT TECHNIQUES

General approaches

Resonance Therapy

- Rezonant Voice Theraphi (Lessac)

- Chant Talk (Boone)
- Humming (Cooper)

Vocal Function

Exercises

- Stemple
- Warm-ups

Accent Method

Estill Voice Therapy

System

LAX-VOX

Muscle Specific Voice Therapy

Singing techniques

- Focusing
- Vowel-consonant manipulation
- Semi-obstructive vocal tract exercises

- Laryngeal lowering-Open throat

Classical singing techniques

- Breath tech (Appoggio)
- Rezonance tech. (Formant tuning, Singer's formant)
- Secondary vocal tech. (Passaggio, Vibrato, Messa di voce)

- Contemporary singing techniques (Belting, falsetto, twang, sob, speech, scream, whisper..)

- Others (tuva, yodel)

Register studies

Specific approaches

Hyperfunctional techniques

- Facilitating approaches (Boone)

- Laryngeal massage (Aronson)

- Breathy phonation (Casper)

- Chewing approach (Froechels)

- Stretch and Flow Tech. (Stone)

- Five finger approach (Humdinger)

- Register glide

- Softening Glottal Attack

Hypofunctional techniques

- Lee Silverman Voice Therapy Technique

- Phonation by swallowing

- Isometric contraction

Changing Pitch

- Manual manipulation

- Pitch gliding

- Ear training

- Using vegetative functions

Techniques for aphonia

- Inhalation phonation

- Using vegetative functions

- Masking

- Manual manipulation

PVCM Therapy

Vocal granuloma therapy

Ventricular dysphonia therapy

(Facilitating approaches)

- Auditory feedback
- Change of loudness
- Chant talk
- Chewing approach
- Confidential voice
- Changing pitch
- Counseling the problem
- Digital manipulation
- Eliminating abuses
- Establishing a new pitch
- Focus
- Glottal fry
- Head Positioning
- Hierarchy analysis
- Inhalation phonation
- Laryngeal massage
- Maskeleme
- Nasal/glide stimulation
- Open mouth approach
- Pitch inflections
- Redirected phonation
- Relaxation
- Respiration training
- Tongue protrusion /i/
- Visual feedback
- Yawn- sigh

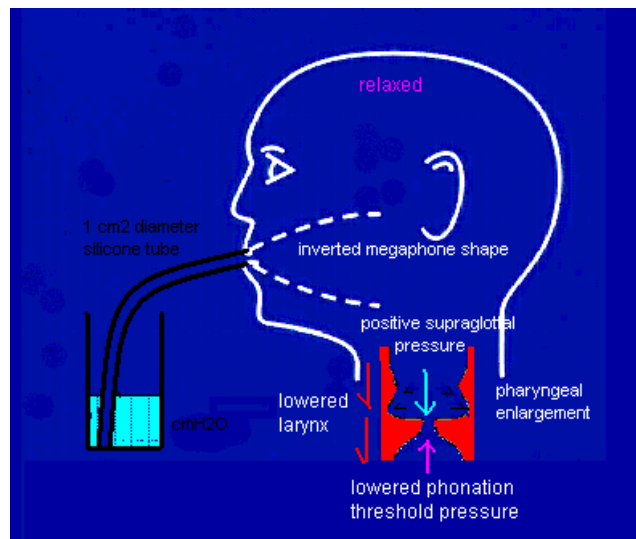
- (Wobble)*
- (Altering glottal attack)*
- (Ear training)*
- (Reverse exercise)*
- (Target voice models)*
- (Pushing approach)*

SEE THE BIG (!) PICTURE!

Remember: The whole picture of voice therapy is not treating the nodule. It is to change the biomechanical and physical process of the phonatory apparatus. One must see the correct scene to understand the whole mechanism of voice. During Laxvoxing all pathways above are used simultaneously.

Physiopathologic pathways of voice therapy techniques:

- Increasing vocal tract inertance
- Enlarging resonance capacity
- Enlarging the striking zone of vocal folds vertically
- Elongating the contact length of vocal folds longitudinally
- Providing optimum tonus of laryngeal intrinsic muscles
- Providing optimum tonus of laryngeal extrinsic muscles
- Providing the optimal tension at vocal fold mucosa for the most effective mucosal wave pattern
- Harmonic -Formant tuning



Lax Vox is a direct technique for general use. It is a holistic and cognitive approach which gives a multichannel biofeedback. The technique uses multiple mechanisms at the same time without forcing –even without thinking!

INSTRUCTIONS OF LAX VOX VOICE THERAPY TECHNIQUE

I-Relaxing and focusing on posture and breathing

- Take a good posture (Ideal for both breathing and laryngeal functions-long spine)
- Face, neck, upper back and chest muscles are relaxed (Freeing the muscles towards gravitation)

II-Preparing to do the bubbling with phonation:

- Place the tube (35 cm length, 9-12mm diameter, silicone) into the mouth between or in front of the incisor teeth and above the tongue.(The tongue should be relaxed as'a piece of steak' and touch slightly to the tube.)
- Hold the bottle near the body so low not to need to use shoulder muscles in holding
- Enclose the tube with the lips
- Dip the other end of tube into water 1 to 2 cm deep at the beginning. Than the depth may be increased to 4-7cm.
- Inhale from nose like in yawning with mouth closed
- Expiration for phonation is prepared focusing on abdominal and lower back muscles

III-Finding the target voice

- Bubbling water with voice: //hhhooooo// (Short and long)
- Repeat with /hhoo hoo hooo/
- Increase the consciousness of the process in the body. Let the patient think about his/her body while doing the exercise.

IV-Advance using the new phonation style

- Pitch gliding (Melodies on //hhhooooo//)
- Gliding pitches up and down
- Test the effect of changing the depth of water...*What changes?*
- Exercise with tube out of water
- Exercise without tube lips open /hhoooo/ and closed /hhmmm/

V-Adopting the new muscle technic to daily life

- Voicing correct syllables-words-sentences
 - *Greeting, good morning etc.*
- Conversational speech
 - *Do not forget to inhale nasally before you say something*
- Read books, newspapers aloud in different ways

TROUBLESHOOTING

No voice? !Or, no *proper* voice?

'Focus your attention to your diaphragm: your voice should not come from your larynx.'

'Think of a boiling teapot in your stomach. Imagine your voice is the sound of bubbling which comes through your chest'

'Feel the bubbling in your throat and mouth: your cheeks must tremble'

Vocalize low /hhuuuu/ normally without tube

Do the same into the tube

Water does not bubble properly or not at all.

The voice is too nasal

Vocalize /pu/ instead of /u/

Or..

..is the tube between the teeth?

..do you sit well? – may start in standing posture.

..are the lips tight (but not cheeks tight) around the tube?

Can not glide?

Jump high intervals starting from high

..then glide down

..then glide down and back again

DO NOT blow like a volcano!

...enlarge the ribcase slightly

..hold it

..vocalise softly

Other Tips...

Exercise for only one minute in an hour

Before and after performance

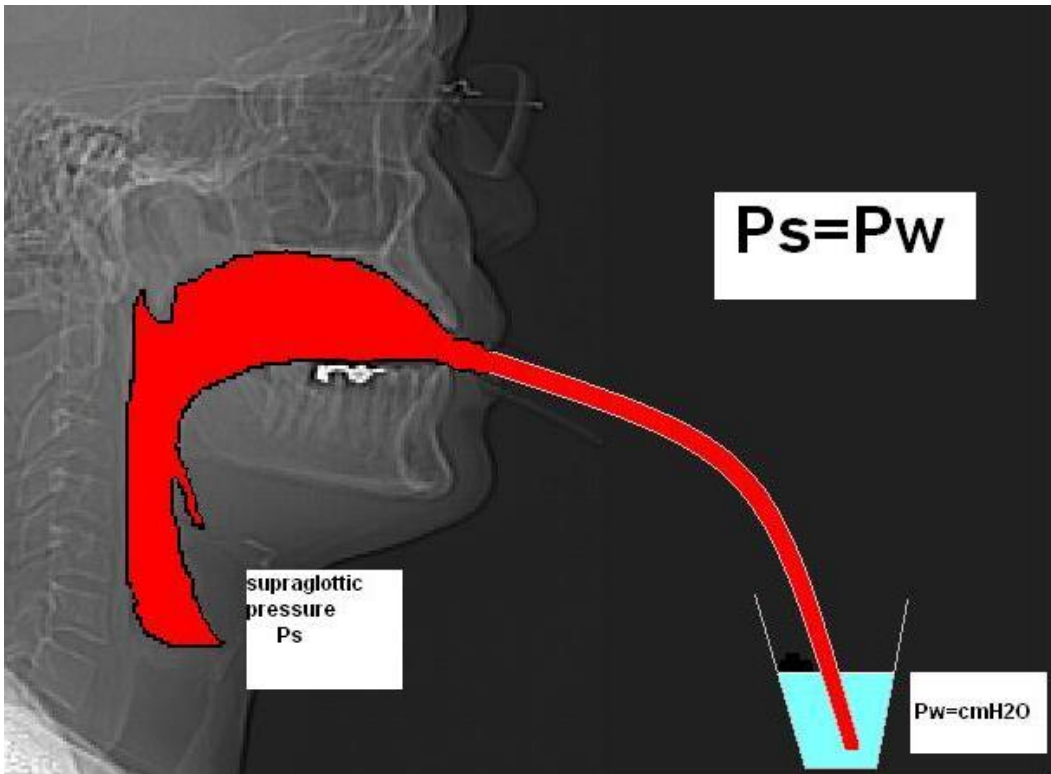
When you wake up in the morning of a hard day

Helps you for stress management

'When you manage your voice, it's easier to manage your life and relationships'

Patients must be convinced about the power of their voice

..Feel the pleasure of slightly abducted vocal folds under high lung pressures but still a harmonically rich voice source!



- Fig. 1: Inertive vocal tract during laxvoicing

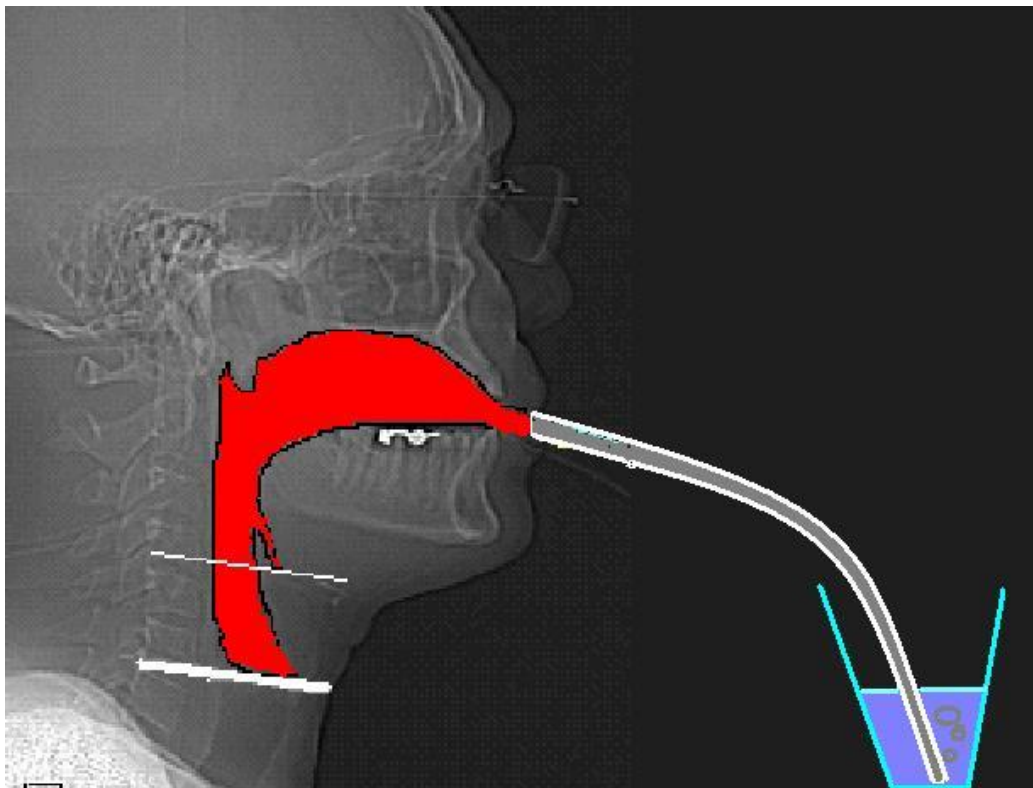
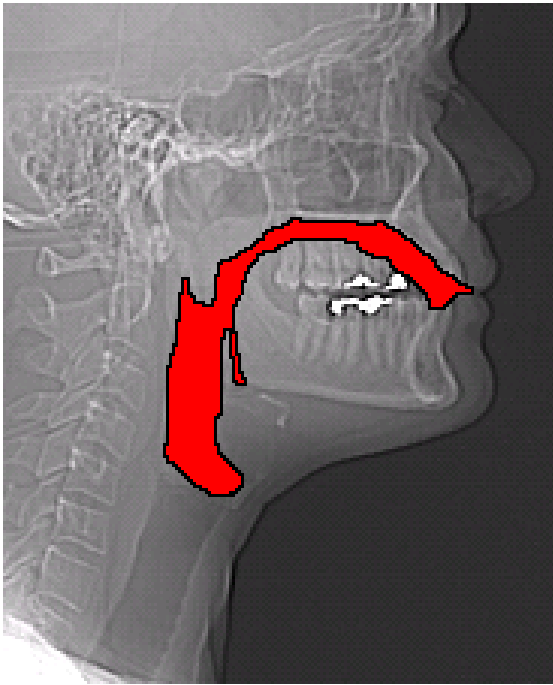


Fig. 2: Lowered larynx during laxvoicing

Fig. 3: Lateral tomograms showing vocal tract changes with /u/ phonation during laxvoxing



/u/ phonation without LV tube



/u/ phonation with the LV tube

MECHANISMS OF THE TECHNIQUE:

1-Positive supraglottal pressure in front of the voice source (Vocal Tract Inertance)

Inertance is an acoustic property of an air mass (usually a column of air in a tube) accelerated or decelerated by pressure. In Human vocal tract, voice source of the system is glottal airflow. Resistance is the filter characteristics of the vocal tract –the formants-. ...And what about inertance?

There are two theories for human vocal tract source filter interactions.

In linear source filter theory, source is independent of filter (vocal tract) and filter resonates frequencies of the source . It was assumed that the voice leaves vocal folds and say good-bye, moves just one way to the lips. On the way, it is modified by filter and does not have any effect back on the glottis.

In nonlinear theory, source frequencies depends on filter (vocal tract) and filter can both modify and resonate the source. Again voice leaves the vocal folds, modified by filter but has effects back on the glottis. In an inertive vocal tract, supraglottal positive pressure feeds energy back to the source of sound thereby strengthening its harmonic content.

During vocal fold opening, positive glottal airflow occurs, and, the pressure just above the level of the vocal folds increases. This positive pressure helps to open the vocal folds. Remember, in Lax Vox, we use a positive pressure of water height just in front of (!) the vocal folds (closed containers rule) and semi occlusion at the level of tube . During vocal fold closure, intraglottal airflow cannot maintain the rate of supraglottal airflow, so the pressure directly above the vocal folds decreases and assists in vocal fold closure as a vacuum effect. As you see here, vibration efficiency is increased not by a muscle force. This is the assistance of inertance in vibration.

Singers use some vocal tract exercises for vocal warm-up and training mixed register. For example lip trills, tongue trills, humming. These are known as Semi-occluded vocal tract exercises. It is a reduction of the cross-sectional area of the vocal tract at or near the lips. Laxvoxing maintains an inertive vocal tract as the semiocluded exercises do.

Inertive Vocal Tract - Acoustic results

- Phonation threshold pressure decreases
- Fast-easy opening and closure of the vocal folds
- Maximum flow declination rate (MFDR) increases
- Vocal intensity increases (Without muscle forces!)
- Closed phase lengthened
- Forward positioning of voice
- Vibration efficiency increases

Semi-occluded vocal tract exercises

- ..maintain singing loudly without forcing vocal folds
- .. lower the threshold pressure by “squaring up” the vocal folds
- ..lower F1 to give the vocalist the benefit of inertive reactance over the entire pitch range
- ..allow pitch and lung pressure to be raised to high levels without excessive vocal fold collision

3-Lowering the larynx

Vertical larynx position(VLP) effects F_0 , voice timbre and to some extent vocal loudness. Thus, VLP is important not only in singing pedagogy but also in clinical voice pathology. Laryngeal lowering is a major technique especially in western classical singing. Hyperfunctional voice disorders are also relevant to heightened vertical larynx position. VLP management strategies are being used widely in the voice clinic and singing class.

Controlling the VLP is mainly achieved by tactile biofeedback which is difficult to understand and perform. Laxvoxing automatically maintains a comfortably lowered larynx position when performed properly.

Effects of the lowered larynx position:

i. Vocal folds are likely to be thicker;

F_0 decreases

ii. Loosens the vocal fold 'cover'

Efficient closing phase

Vocal intensity increases

Flow phonation

iii. Loosens the thyroarytenoid muscle

The control capacity of thyroarytenoid (TA) muscle increases due to reduction of muscle tension

Better opportunity to get the TA muscle actively involved in vibration

iv. Resonating volume increases by:

The vocal tract elongation

Hypopharyngeal enlargement

Vertically stretched and flattened ventricular folds

Inverted megaphone shape

Anteriorly placed tongue

Palatal rise(Pre-yawn position)

v. Larynx-hyoid bone-tongue relation loosens, the tongue moves forward

vi. Extraneous tension in the neck and shoulders are tend to be decreased

vii. Abdominodiaphragmatic respiration becomes a natural result.

2-Artificial elongation of the vocal tract

The benefit of artificial elongation of vocal tract using resonance tubes is mainly to lower the first formant. So phonation fundamental frequency can be more easily produced near first formant. This would allow a student or patient to experience the sensory effects of lower phonation threshold pressure as well as a lowered average airflow. And these are the components of a low-effort voice production

Acoustic results of elongation of vocal tract

- i. Lowered F1*
- ii. Lowered phonation threshold pressure*
- iii. Lowered airflow*
- iv. Low-effort voice production*
- v. Resonance tubes-voice interaction levels*

Interaction levels of artificial elongation of the vocal tract

1. Acoustic-aerodynamic interaction (*acoustic pressures* → *glottal flow pulse*)
2. Mechano-acoustic interaction (phonation threshold pressure)(*vocal tract pressures* → *vibrational characteristics*)
3. Neuro- mechanic interaction (*Non-laryngeal articulatory movements* → *laryngeal settings*)

4-Relaxation

'KEY' for good voice

Meditation, hypnosis, postural alignment, etc may be used.

'The device' takes the attention from daily life

Relaxation is the first step and '*sine qua non*'

Begin with forehead and then eyelids, cheeks, tongue and jaw in order

'feel your head, neck and shoulders over clouds'

'think and remember how you feel in relaxed position'

Keeping the relaxed position stable -floating head, silly face start bubbling with voice. Your cheeks must be relaxed and let them tremble with bubbling. Then extend the trembling into your throat. Play with focus, you will find the best place!

Do not even move your suprahyoid region. First you may try bubbling without voicing to feel and understand that it is possible to phonate with relaxed suprahyoid muscles.

5-Altering kinesthetic sensitivity

Changing habits by proprioceptive biofeedback

-Eases to feel and to manage the subglottal pressure and resonance spaces

-Helps tactile biofeedback for symmetrical adduction and relaxation

-Sensation of efficiency in converting aerodynamic energy to acoustic energy

6-Proper abdominodiaphragmatic respiration

Lax Vox facilitates abdomino-diaphragmatic respiration by:

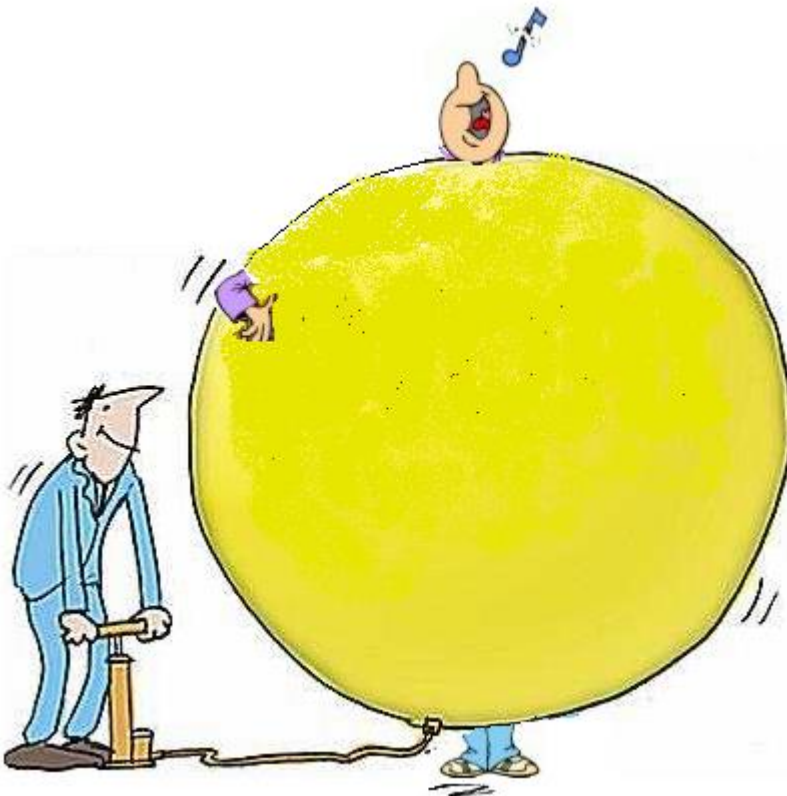
Relaxation of secondary breathing muscles

Reduces extraneous tension in the neck and shoulders

Dissolves the compact arrangement of the larynx, hyoid bone and tongue

The correct breathing type comes without 'thinking'

It may not be necessary for all of the patients to work on abdomino-diaphragmatic respiration technique. Vocal demands will help to decide. But not to concern about more than one mechanism at the same time will make the things easier.



GOAL(S)

In fact, there's only one goal: reaching and using the target voice. You can call it in different words: 'Maximum vocal economy', 'Maximum output-cost ratio', 'Vocal efficiency', 'Resonant voice', 'Flow phonation'...

The main issue is simply the glottal efficiency. In other words, output-cost ratio (which is calculated by dividing radiated oral acoustic power to aerodynamic input power) is the formula of vocal trade-off. Resultant voice projects well, easy to produce, involves a sensation of vibration in the imaginal mask on the face and characterized by ample harmonic content.

CONCLUSION

Treatment success for voice disorders depends on many factors: the disorder being treated, the clinicians treating it and the patient. Patients who are interested in their voices and are motivated to make improvements generally are likely to get the best overall long-term results from treatment. This is partly because such patients tend to follow treatment recommendations.

In the voice clinic, Lax Vox is a holistic therapy for various functional and organic voice disorders (muscle tension dysphonias, vocal fold nodules and polyps, habitual and psychogenic dysphonias-aphonias, vocal fold paralysis, presbiphonias, pre and postoperative phonosurgery ...)

Lax Vox is also a useful approach for voice professionals. Singers can use it to warm-up and down and to find the 'position' of singing voice. By relaxing the unnecessary muscle groups, it increases the consciousness about the vocal mechanism. It can be used to facilitate messa di voce and lowered larynx techniques.

Lax vox is easy to follow, easy to teach, easy to learn and easy to perform at home. There are not so many things to remember and do at the same time. Patient uses a 'device' (!). A perfect and trained ear is not so much required for Lax Vox. It can be performed not only by voice therapists but also by laryngologists. The patients accept and use the technique easily and may daily train by themselves.



Contact:

www.fonomed.net

iilterdenizoglu@yahoo.com

marketta.sihvo@gmail.com