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## Presentation of the Comprehensive Vocal Rehabilitation Program for the treatment of behavioral dysphonia

### *Apresentação do Programa Integral de Reabilitação Vocal para o tratamento das disfonias comportamentais*

#### ABSTRACT

Voice rehabilitation is the main treatment option in cases of behavioral dysphonia, and it has the purpose of enhancing the quality of vocal production and voice-related life aspects. Several efforts have been made to offer a clinical practice that is based on evidence, including the development of specific therapeutic protocols as an option for clinical and scientific improvement. It is necessary to define the focus/objective of the dysphonia treatment, type of approach, and duration in order to establish the intervention criteria. This paper describes the organization of a program of behavioral dysphonia treatment, based on an approach that has been used for over twenty years, named Comprehensive Vocal Rehabilitation Program, and also to present its concepts, theory, and practical fundamentals. The program has an eclectic approach and associates body work, glottal source, resonance, and breathing coordination in addition to knowledge about vocal hygiene and communicative behavior. The initial proposal suggests a minimum time of intervention of six therapeutic sessions that can be adapted according to the patient's learning curve and development. The goal is to offer a rational and structured therapeutic approach that can be reproduced in other scenarios.

#### RESUMO

A reabilitação vocal é a primeira opção de tratamento nos quadros de disfonia comportamental e tem como objetivo a melhoria da produção vocal e da qualidade de vida nos aspectos relacionados à voz. Muitos esforços estão sendo feitos para que a prática clínica fonoaudiológica seja baseada em evidências, o que inclui o desenvolvimento de protocolos terapêuticos específicos como opção para o aprimoramento clínico e científico. É necessário definir o foco/objetivo, tipo de abordagens e tempo de tratamento para estabelecer critérios de intervenção nas disfonias. Este artigo registra a organização de um programa de tratamento da disfonia comportamental, que consiste em abordagens utilizadas há mais de duas décadas na clínica vocal, denominado Programa Integral de Reabilitação Vocal, e apresenta os seus conceitos, teoria e fundamentos práticos. O programa tem abordagem eclética e associa trabalhos de corpo, fonte glótica, ressonância e coordenação pneumofônica, aliados aos conhecimentos de higiene vocal e atitude comunicativa. A proposta inicial sugere intervenção mínima com seis sessões de terapia, que podem ser adaptadas ao tempo de aprendizado e desenvolvimento do paciente. A intenção é oferecer uma prática terapêutica racional e estruturada, que possa ser reproduzida em outros cenários.

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## INTRODUCTION

Vocal rehabilitation is considered the best treatment for behavioral dysphonia, as it is aimed at improving vocal production and reducing the negative impact of a given vocal disorder on the patient's life quality. Despite the scientific efforts in this area, the literature is scarce in relation to evidence that proves the efficacy of speech rehabilitation as a treatment for behavioral vocal disorders<sup>(1,2)</sup>. One of the limitations in obtaining evidence of its quality is not the absence of positive therapeutic effects, but the methodological imprecision of the experiments, particularly in regards to the level of detailing of the rehabilitation programs<sup>(2)</sup>.

In Brazil, the therapeutic tradition around vocal rehabilitation has a predominantly symptomatic and holistic focus<sup>(3,4)</sup>. The recognition of the use of multiple approaches in an organized and rational manner is evident in some texts that propose eclectic interventions<sup>(5)</sup> with elements of different philosophical orientations.

The model of care presented here was initially proposed at Instituto da Laringe (Larynx Institute) in the 1970s and expanded to be used in the Ambulatories of Larynx and Voice of Universidade Federal de São Paulo. It was then disseminated in the Specialization Program in Voice at Centro de Estudos da Voz (Center for the Study of Voice) in the 1990s. The approach described below is named Comprehensive Voice Rehabilitation Program (CVRP), and it is a consolidation of the aforementioned experiences. The publication of the CVRP's guidelines in the 1990s<sup>(5)</sup> was reorganized in the 2000s<sup>(6)</sup> and it rests on three pillars: orientation, psychodynamics, and vocal training.

In order to understand the philosophy behind the program, it is necessary to reflect upon the aspects that might compromise the successful outcome of the treatment: chronicity of the disorder, nature of voice alteration, medical history, presence or absence of secondary gains consequential of dysphonia, variability of vocal techniques, duration of the treatment<sup>(7)</sup>, the speech-language pathologist and/or audiologist's knowledge and abilities<sup>(7,8)</sup>, and his/her personality<sup>(9)</sup>. In addition to these aspects, studies also point out the patient's motivation<sup>(10,11)</sup>, faith in the treatment<sup>(7,8)</sup>, adhesion<sup>(12,13)</sup>, necessity to take off-time from work in order to undergo treatment, and difficulty to change vocal behavior<sup>(14)</sup>.

A defined program increases the chances of a therapeutic connection with the patient and ensures his/her adhesion through knowledge obtained beforehand about the stages of the work to be developed and the goals to be achieved. The premise of the CVRP is to understand individuals with behavioral vocal alterations in a comprehensive manner and to abide by a segmented proposal of learning about the therapeutic process. The treatment involves identification, awareness, and modification of negative vocal habits, proposition of techniques of association between body and voice, glottal adjustment, and resonance balance. These aspects, associated with the articulatory precision of speech sounds, impact the coordination between breathing, phonation, resonance and articulation, and voice projection.

The pillar of voice orientation rests on matters of vocal hygiene or well-being through the identification of negative behaviors and habits, and on suggestions of replacement validated by the patient.

In regards to vocal psychodynamics, we use audio and video files to identify vocal disorders and to analyze the impact of altered voices from professional, social, and emotional viewpoints. A patient's voice image is approached considering his/her input, and he/she defines which aspects to modify.

The third pillar, vocal training, is crucial in direct therapy<sup>(15)</sup>; it is composed of exercises for the subsystems of speech practiced during the sessions and their intervals, three to five times a day, and registered in media files that aid in their conduction. Daily practice increases laryngeal resistance and muscle mass, cortical learning, and retention and memorization of acquired knowledge<sup>(14)</sup>.

The program privileges five aspects: body-voice, glottal source, resonance, coordination between breathing, phonation, resonance and articulation, and communicative attitude. The integration between body and voice has a fundamental role in dysphonia; therefore, we work with body posture during speech, and with the patient's perception of the engagement of cervical muscles and scapular waist using visual, auditory, and kinesthetic feedback. In the case of individuals who use their voice professionally, we discuss aspects related to specific work situations.

Working with the glottal source demands physiological thinking, and it consists of selecting techniques that improve glottal coaptation and voice efficiency in addition to exercises that mobilize vocal folds mucosa, thus increasing vibration range.

Concerning voice resonance, the intervention occurs by means of exercises that integrate source and filter with the purpose of favoring voice production without excessive effort. Resonance perception and control are difficult abilities for the patients, and the challenge is to calibrate them with kinesthetic clues that facilitate the transfer to speech.

The combined control of breathing, phonation, resonance and articulation is a resource that directly uses breathing for oral communication. The exercises contribute to the coordination of these subsystems, favoring voice quality, fluency, and speech intelligibility. Although the patient might be aware of this process initially, the goal is to automatize it.

Furthermore, the patient's communicative attitude permeates the process. There are no specific strategies to address it, but it is based on the relationship between the therapist and the patient and on the way communication unfolds during the sessions, with positive reinforcement and presentation of challenging situations. The patient must not practice the exercises mechanically, but focus on controlling the adjustment required, and actively aim at engaging motor gestures to achieve ideal vocal production.

The learning process varies among the individuals, and the initial proposal of six weekly sessions and home exercises can be adapted according to each patient's evolution (Chart 1).

**Chart 1.** Description of the six sessions of the Comprehensive Voice Rehabilitation Program

<p>Session 1 – Working with the glottal source</p> <ul style="list-style-type: none"> <li>• Orientation: norms of vocal well-being and identification of controllable situations;</li> <li>• Design of a graph to register the occurrence of the most altered aspects;</li> </ul> <p>Psychodynamics: analysis of the impact of the altered voice; quick training of perception of vocal deviations, and verification of the effects of voice-related problems within the VHI's domains (Voice handicap Index).</p> <p>Training:</p> <ul style="list-style-type: none"> <li>• Vibrant sounds technique – exercises of tongue or lip vibration, or emission of fricative sounds for one minute or 10 times;</li> <li>• Vibrant sounds technique – exercises of tongue or lip vibration, or emission of modulated fricative sounds for one minute or 10 times;</li> <li>• Blow sound technique for one minute or 10 times.</li> </ul>
<p>Daily home exercises, twice a day – week 1</p> <ul style="list-style-type: none"> <li>• Vibrant sounds technique – exercises of tongue or lip vibration, or emission of fricative sounds for one minute or 10 times;</li> <li>• Vibrant sounds technique – exercises of tongue or lip vibration, or emission of modulated fricative sounds for one minute or 10 times;</li> <li>• Sounded blow technique for one minute or 10 times.</li> </ul>
<p>Session 2 – Working with source and filter</p> <ul style="list-style-type: none"> <li>• Assessment of the effects and outcome of the exercises practiced at home;</li> <li>• Orientation about voice use;</li> <li>• Scapular waist movements, and stretching of arms, shoulders, and cervical region for five minutes;</li> <li>• Tongue or lip vibration technique, or emission of modulated fricative sounds for one minute or 10 times;</li> <li>• Technique of nasal /m/ or /n/ sounds sustained for one minute;</li> <li>• Gradual tongue vibration for one minute or 10 times;</li> <li>• Technique of nasal /m/ or /n/ sounds modulated for one minute or 10 times;</li> <li>• Gradual tongue vibration technique for one minute or 10 times;</li> <li>• Sounded blow technique for two minutes or 20 times;</li> <li>• Chewing method with nasal sounds two minutes or 20 times.</li> </ul>
<p>Daily home exercises, twice a day – week 2</p> <ul style="list-style-type: none"> <li>• Tongue or lip vibration technique, or emission of modulated fricative sounds for one minute or 10 times;</li> <li>• Masticated nasal sound technique for one minute or 10 times;</li> <li>• Sounded blow technique for one minute or 10 times;</li> <li>• Tongue or lip vibration technique, or fricative sounds modulated for one minute or 10 times.</li> </ul>
<p>Session 3 – Working with source, filter, breathing and phonation coordination, and articulation</p> <ul style="list-style-type: none"> <li>• Assessment of the effects and outcome of the exercises practiced at home;</li> <li>• Orientation about voice use;</li> <li>• Scapular waist movements, and stretching of arms, shoulders, and cervical region for five minutes;</li> <li>• Tongue or lip vibration technique, or emission of fricative sounds without modulation along with cervical movements for one minute or 10 times;</li> <li>• Tongue or lip vibration technique, or emission of modulated fricative sounds for one minute or 10 times;</li> <li>• Nasal sound scales technique for one minute or 10 times;</li> <li>• Sounded blow technique with rounded vowels for two minutes or two sequences with the seven vowels;</li> <li>• Nasal sound technique in phonatory units for one minute or 10 times;</li> <li>• Technique of silent and sonorous fricative sounds with vowels for two minutes or two seven-vowel sequences.</li> </ul>
<p>Daily home exercises, twice a day – week 3</p> <ul style="list-style-type: none"> <li>• Tongue or lip vibration technique, or emission of modulated fricative sounds along with cervical movements for one minute or 10 times;</li> <li>• Technique of nasal /m/ sound with ascending and descending scales for one minute or 10 times;</li> <li>• Sounded blow technique with rounded vowels for one minute or one seven-vowel sequence;</li> <li>• Technique of silent and sonorous fricative sounds with vowels for one minute or one seven-vowel sequence.</li> </ul>
<p>Session 4 – Working with source, filter, breathing and phonation coordination, and articulation</p> <ul style="list-style-type: none"> <li>• Assessment of the effects and outcome of the exercises practiced at home;</li> <li>• Orientation about voice use;</li> <li>• Scapular waist movements, and stretching of arms, shoulders, and cervical region for five minutes;</li> <li>• Tongue or lip vibration technique, or emission of fricative sounds with ascending and descending scales for one minute or 10 times;</li> <li>• Sounded blowing technique with rounded lips for two minutes or 20 times;</li> <li>• Technique of silent and sonorous fricative sounds with short vowels for two minutes or a seven-vowel sequence repeated twice;</li> <li>• Technique of nasal /m/ or /n/ sounds in phonatory units for two minutes or 20 times;</li> <li>• Nasal sound technique in phonatory units with vowels for two minutes or one seven-vowel sequence repeated twice.</li> </ul>

Continue...

**Chart 1.** Continuation

Daily home exercises, twice a day – week 4
<ul style="list-style-type: none"> <li>• Tongue or lip vibration technique, or emission of fricative sounds with ascending and descending scales for one minute or 10 times;</li> <li>• Sounded blowing technique with rounded lips for one minute or 10 times;</li> <li>• Technique of sonorous fricative sounds with short vowels for one minute or one seven-vowel sequence;</li> <li>• Nasal sound technique in phonatory units along with vowels for two minutes or two seven-vowel sequences.</li> </ul>
Session 5 – Working with source, filter, breathing and phonation coordination, and articulation
<ul style="list-style-type: none"> <li>• Assessment of the effects and outcome of the exercises practiced at home;</li> <li>• Orientation about voice use;</li> <li>• Scapular waist movements, and stretching of arms, shoulders, and cervical region for five minutes;</li> <li>• Tongue vibration technique alternated with lip vibration, or emission of fricative sounds with ascending and descending scales for one minute or 10 times;</li> <li>• Sounded blowing technique with rounded lips and short vowels for two minutes or two seven-vowel sequences;</li> <li>• Masticated nasal sound technique with vowels for one minute or 10 times;</li> <li>• Technique of sonorous fricative sounds with long vowels for one minute or one seven-vowel sequence;</li> <li>• Nasal sound technique followed by vowels for two minutes. Two-time repetition of the exercise with the seven vowels;</li> <li>• Technique of nasal sound sequences followed by consonantal groups for three minutes (pataka, peteké, petekê, pitiki, potokó, potokô, putuku...).</li> </ul>
Daily home exercises, twice a day – week 5
<ul style="list-style-type: none"> <li>• Tongue vibration technique alternated with lip vibration, or emission of fricative sounds with ascending and descending scales for one minute or 10 times;</li> <li>• Sounded blowing technique with rounded lips and short vowels for two minutes or two seven-vowel sequences;</li> <li>• Technique of nasal sound sequences followed by consonantal groups for two minutes.</li> </ul>
Session 6 – Working with source, filter, breathing and phonation coordination, and articulation
<ul style="list-style-type: none"> <li>• Assessment of the effects and outcome of the exercises practiced at home;</li> <li>• Orientation about voice use;</li> <li>• Scapular waist movements, and stretching of arms, shoulders, and cervical region for five minutes;</li> <li>• Tongue vibration technique alternated with lip vibration, or emission of fricative sounds with ascending and descending scales for one minute;</li> <li>• Sounded blowing technique with rounded lips and short vowels for two minutes;</li> <li>• Masticated nasal sound technique with vowels for one minute or one seven-vowel sequence;</li> <li>• Technique of sonorous fricative sounds with long vowels for one minute or one seven-vowel sequence;</li> <li>• Nasal sound technique followed by vowels for two minutes or two seven-vowel sequences;</li> <li>• Technique of nasal and sonorous sound sequences followed by consonantal groups for three minutes.</li> </ul>
Daily home exercises, twice a day – week 6
<ul style="list-style-type: none"> <li>• Tongue vibration technique alternated with lip vibration or fricative sounds with ascending and descending scales for one minute;</li> <li>• Sounded blowing technique with rounded lips and short vowels for one minute or one seven-vowel sequence;</li> <li>• Technique of nasal sound sequences followed by consonantal groups for two minutes.</li> </ul>

**CLINICAL INDICATIONS**

The CVRP has been updated, organized, and targeted at cases of behavioral dysphonia, particularly individuals who use their voice professionally, and it can also be employed in cases of dysphonia consequential of muscle tension.

The program follows general principles of motor learning, and each stage of the treatment can be controlled. Its systematization, suggestion of alternate procedures, incentive to daily practice, and validation of new vocal habits combined with the construction of a competent voice image contribute to the success of the treatment.

**IMPLICATIONS FOR CLINICAL PRACTICE AND RESEARCH**

The conduction of randomized and controlled clinical studies is important to determine the level of efficacy of voice

treatments, the number of sessions and exercises, and the follow-up procedures that guarantee satisfactory results.

The influence of a patient’s number of symptoms and how long he/she has been complaining about a given voice disorder on the program’s duration and results needs to be explored further. Moreover, the benefits of removing an individual from his/her professional activities during rehabilitation have yet to be proven.

**CONCLUSION**

The CVRP systematizes the knowledge acquired over the course of more than two decades of caring for patients with behavioral dysphonia. The proposal includes six initial sessions of increasing difficulty that aim at exploring aspects initially presented in the overall approach to dysphonia. It is a holistic approach that understands voice disorders as multifactorial, thus demanding several perspectives of intervention.

\* MB and PP were responsible for the creation, elaboration, and definition of the program; MB and VP were responsible for writing the first draft of this paper; MB, VP, RY, and GM elaborated the chart; all the authors corrected and revised the final version of the manuscript.

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