Voice Therapy for the Professional Voice

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The practice of speech-language pathology includes prevention, habilitation, and rehabilitation of communication, swallowing, or other upper aerodigestive disorders; elective modification of communication behaviors, and enhancement of communication [1]. The American Speech-Language-Hearing Association (ASHA) states that the speech-language pathologist should provide prevention, screening, consultation, assessment, treatment, intervention, management, counseling, and follow-up services for speech, voice, language, swallowing, cognition, and sensory awareness for communication, swallowing, and upper aerodigestive functions. In the area of treating voice disorders, the speech-language pathologist is concerned not with diagnosis and treatment of laryngeal diseases or other physiologic disorders, but rather with understanding, analyzing, and modifying vocal function.

If, perceptually, the voice is within normal limits for the patient and is being produced in a reasonably efficient, nonabusive manner, then intervention by a speech-language pathologist need not be conducted. It is not within the speech-language pathologist’s scope of practice to provide special training that develops range, power, control, stamina, and the esthetic quality required for artistic expression. The speech-language pathologist is concerned with the voice that presents with a current or potential problem, identifying and analyzing the problem, and then helping the voice user modify vocal behaviors to use the vocal mechanism with optimal efficiency. In the case of the professional voice user, increased demand and expectations for voice quality may be present and should be considered when judging normalcy of the voice. Responsibilities in ameliorating voice problems...
include: analyzing vocal behaviors perceptually and objectively; analyzing vocational, educational, and psychologic factors that may interact with vocal behaviors and precipitate, maintain, or exacerbate vocal difficulty; and designing and implementing an individual program for modifying vocal behaviors [2].

Similar to physicians and their subspecialities, speech-language pathologists vary in their backgrounds and experience in the treatment of voice disorders. Furthermore, the curricula that speech-language pathologists complete during education and training vary widely and typically only address normal and disordered voice production at a general level. Curricula rarely provide education or knowledge about the professional voice. Before making a referral to a speech-language pathologist for voice therapy, therefore, his or her background and training should be considered.

This article focuses on the speech-language pathologist’s treatment of voice disorders with special emphasis on the treatment of professional voice users. There are many factors to consider when working with professional voice users. The following is not meant to be an inclusive list but is intended merely to provide a framework of key considerations. Evaluation and treatment of a professional voice user requires increased sensitivity from the clinician. At first, when listening to the patient’s voice, it may sound normal. Sounding normal is relative, however. The professional voice user typically has increased awareness of minute changes in the voice production and quality. A speech-language pathologist must therefore be “super sensitive to super speaking.” The goals of the professional voice user or performer are typically different from those of a nonperformer and must be considered as such. With that in mind, it is important to learn the patient’s expectations and provide a realistic perspective on the possible outcome of therapy based on the diagnosis and response to trial therapy techniques during the initial assessment.

Further consideration must be given to body and self-awareness issues in performers versus nonperformers. Body and self-awareness, in this sense, refers to the patient’s awareness of his or her own behaviors and the ability to make changes as instructed. Professional voice users may have increased awareness of vocal behaviors, depending on their previous depth of training. Body and self-awareness are important skills to develop or maximize in the voice user. They aid the patient in developing, recognizing, and maintaining techniques for efficient voice use.

Environmental contributions also should be noted. As a professional voice user, the patient may be in detrimental performance situations that may not be obvious to a treating clinician. These may include poor acoustics while performing, interference of costumes and clothing, positional factors, and so forth, which can be significant contributing factors to suboptimal voice performance. The clinician must therefore ask specific questions or even attend a rehearsal or performance to make a complete assessment of conditions.
Psychologic factors also commonly contribute to voice problems. The voice can be described as an emotional part of each person. Studies by Fonagy, described by Sundberg [3], have indicated that articulatory and laryngeal structures and respiratory muscle activity patterns change in relation to 10 different emotions. This finding indicates an emotional/psychologic connection to the voice. Psychologic factors may be related to the patient’s response to the voice disorder and its effect on his or her life. Or, the voice disorder may be the manifestation of a larger psychological issue that is causing a voice disorder, as in psychogenic voice disorders. In either case, treatment should be tailored to the needs of each patient with careful history taking and thorough examination. The speech-language pathologist may act as a patient advocate speaking with the physician and acting as a catalyst for a referral to the appropriate psychologic professional as deemed necessary by the physician.

Emotional factors also can affect the patient’s overall response to the voice disorder. Is the patient able to cope with the voice disorder? How will it affect his or her current life, voice demand and expectations, and career? Are past vocal experiences, the diagnosis, or other people’s responses affecting therapy sessions or outcomes [4]? These basic questions should be addressed with the patient.

Treating voice patients requires the interaction of many disciplines. Patients and clinicians alike benefit from a team approach to the voice patient’s care. Treatment by an interdisciplinary team is important when treating anyone who has a voice disorder and crucial when treating the professional voice user. The members of the team may include a laryngologist, speech-language pathologist, singing voice specialist or singing teacher, acting voice specialist, voice researcher or scientist, singing coach, or psychologist (Table 1). Relationships with other arts medicine specialists are also important, including neurologists, pulmonologists, gastroenterologists, endocrinologists, physiatrists, psychiatrists, and others.

In some centers the interdisciplinary team may be in one facility, but not always. Whenever possible, it is beneficial for voice therapy and singing voice therapy to be completed by two different professionals. When this occurs adequate time is spent on both areas of the voice, the clinicians can work together to target areas in the speaking and singing voice, and each clinician can advise the patient within the area in which they are working, regardless of the individual background. If team members are not within the same facility it is important to build relationships within the community to maximize patient care.

In specific cases other specialists may be included in the interdisciplinary team. The voice researcher or scientist can provide valuable insight and perspective regarding the care of a voice patient because of his or her specific knowledge and skill set in acoustic measurement and voice production. Referral to a singing voice coach may also be useful following rehabilitation work with the speech-language pathologist and singing voice specialist.
The singing voice coach is a valuable aid in the development of artistic style and repertoire for the voice user. A psychologist or psychiatrist may prove valuable in a team setting, providing the patient with counseling for the management of emotional reactions to the voice disorder along with psychological issues that may have contributed to its occurrence. In addition, a physiatrist may offer contributions in the way of addressing areas of tension or other injury throughout the body.

Regarding the interdisciplinary team, singing and acting voice specialists, in addition to the singing coach, have no formal licensing or certification board. It is therefore important to understand that resources from community to community can vary widely, as can the backgrounds and knowledge of various voice professionals. For example, singing and acting voice teachers and coaches are not trained to work with the injured voice and therefore may not have experience in this area. Singing voice specialists and acting voice specialists are experienced teachers who have acquired such training, usually through apprenticeships.

The interdisciplinary approach to the treatment of voice disorders is increasingly important. Professional organizations are recognizing the development of these specialized relationships. ASHA has worked in conjunction with the National Association of Teachers of Singing and the Voice and Speech Trainers Association to present a joint statement, “The role of the speech language pathologists, the teacher of singing, and the speaking voice trainer in voice habilitation” [5]. This statement is intended to encourage
interdisciplinary treatment of voice disorders and to encourage professionals working with voice patients to work within the scope of practice and laws regarding treatment. It is important for professionals to stay within the bounds of their knowledge and remain within their area of expertise. ASHA has also worked with the Speech, Voice, and Swallowing Subcommittee of the American Academy of Otolaryngology–Head and Neck Surgery to generate a joint statement, “The use of voice therapy in the treatment of dysphonia” [6]. This statement recognizes the importance of voice therapy in conjunction with medical and surgical management in treating voice disorders as supported by clinical research and expert experience. These statements should be used to advocate for speech pathology services to benefit the patients treated and the field as a whole.

Voice evaluation

The initial voice evaluation should include a thorough review of case history, performance of objective and subjective evaluation, trial therapy, and assembling initial impressions and recommendations. This evaluation provides the clinician with baseline information about vocal function, patient stimulability and possible therapy techniques and approaches, expectations of the voice user, and information from which to draw conclusions regarding success of therapy and possible outcomes.

Case history

A thorough case history should be elicited from the patient beginning with the onset and development of the voice problem and the circumstances under which it ensued. The patient’s previous or current medical diagnoses and treatments should be reviewed. The duration of the voice disorder and its constancy are also important factors. In some cases, voice problems can be intermittent over many years with the patient not having pursued treatment until the problem worsened significantly. Knowing this information can give the clinician perspective on the patient’s overall voice disorder. Whether or not the patient had received voice therapy previously should be documented. If so, when the treatment took place, its duration, techniques used, and whether previous treatment was effective should noted. These factors can indicate how receptive the patient will be to further intervention and how he or she will likely respond to different voice therapy techniques.

A complete inventory should be taken regarding vocal hygiene, including hydration and intake of drying agents; engagement in phonotraumatic behaviors, including yelling, shouting, loud talking, coughing, and throat clearing; exposure to other irritants, including smoking, exposure to second-hand smoke, and stage smoke; and behavioral factors that may include sleep patterns, overall rest, and environmental factors. In addition, vocal
demands should be reviewed and the patient should provide examples of voice use during a typical day. Throughout this inventory, the patient should explain the primary vocal complaints so as to provide the clinician with a possible starting point for intervention. The patient’s initial concerns are addressed immediately and this may increase his or her motivation to continue therapeutic intervention.

Special factors must be considered when eliciting a history from a professional voice user. Learning vocal complaints as they relate to the performance voice can be helpful. The clinician should inquire about the history of professional voice use, whether it be singing, acting, public speaking, or a combination thereof. The clinician should also ask about the genre of music the patient is singing, voice classification, performance venues, and the size of his or her typical audience, if any. Knowing the extent of the professional voice user’s vocal training is also valuable, particularly when and how long he or she has studied, the specific school of training, and whether he or she is studying currently. This process provides information about the types of vocal techniques the patient may already use or be aware of, or those that may need to be developed or reworked further.

The clinician should request that the patient share his or her professional goals and expectations for voice. Ideally, voice therapy should be tailored to accommodate the patient’s professional and career goals concurrently with satisfying the clinician’s therapeutic objectives. Even though the singing voice specialist typically performs a more thorough evaluation of the complaints of a singer, the speech-language pathologist can play an important role in singing voice rehabilitation and development. The clinician can use knowledge of a patient’s background, education, and experience to assist in development of efficient daily speaking voice and in articulating the relationship between daily speaking routines and singing or stage voice.

**Objective evaluation**

Gathering and analyzing objective voice data is a crucial part of the complete voice evaluation. Completing pre- and posttherapy voice measures can supply objective data to assist in predicting therapy outcomes, to use in research, and to provide tangible voice statistics for use by insurance companies. The objective voice evaluation is discussed further in the article about laboratory and strobovideolaryngoscopy evaluation elsewhere in this issue.

**Subjective voice evaluation**

**Respiration**

The respiratory system is the source of power for voice production. Many voice problems can be related to poorly coordinated breathing. The clinician should pay special attention to the manner in which the voice user inhales and then exhales air to produce voice during the evaluation. Observation
of the patient’s breathing pattern should be completed during reading and conversational speech. Breathing patterns that may be inefficient for voice production include clavicular breathing, upper thoracic breathing, or a combination of the two. So-called “diaphragmatic breathing” can be the most efficient breathing pattern because it tends to provide optimal balance of inspiratory and expiratory muscle use. Speaking on residual air, shortness of breath while speaking, gasping for air during inhalation, forced exhalation, or decreased airflow during phonation are also common indicators of vocal misuse.

**Phonation**

Phonation is defined as the production of sound at the level of the vocal folds. A perceptual evaluation of phonation (vocal quality, loudness and pitch) during reading and conversation should be completed. Vocal quality characteristics may include: hoarseness, breathiness, roughness, raspiness, vocal fry, diplophonia, voice breaks, pitch breaks, and others. Vocal intensity or loudness should be judged as appropriate, increased, or decreased for the particular setting. The pitch of the patient’s voice should be judged as appropriate, high, or low for the age and gender. In addition, the frequency of hard glottal attacks should be assessed.

**Resonance**

Vocal resonance refers to the way sound is shaped acoustically as it travels through the vocal tract. Phonation begins at the level of the vocal folds and moves up through the pharynx, oral cavity, and nasal cavity. Frontal resonance or forward focus of sound is ideal for most efficient voice production. It optimizes acoustics of the vocal tract while balancing oronasal resonance. The use of resonant voice therapy, which places emphasis on frontal tone focus, can increase perceived vocal loudness levels, which then may allow the voice to be heard better in noisy situations without excessive strain. Various resonance patterns may be observed while making a perceptual judgment of the voice, including oral, oropharyngeal, nasal, nasopharyngeal, and hypopharyngeal.

**Posture**

Body posture, how the body is held up against gravity, can have a direct effect on respiration, phonation, and resonance. Posture is a complicated interaction of muscle groups throughout the body. There are multiple disciplines that target body work to improve posture and overall wellness, including Alexander, Feldenkrais, Pilates, and Rolf [2]. Posture should be assessed paying attention to placement of the hips, spine, shoulders, neck, head, jaw, and even tongue while at rest and in movement. Posture may be assessed statically in the sitting or standing position and in movement while walking, running, dancing, teaching, and so forth. Considerations should be made to observe the patient during activities in which they engage daily.
A brief explanation may be given to the patient so that posture can be better understood. While sitting, posture can be described as the feet resting flat on the ground, knees at a 90° angle, hips at a 90° angle, shoulders above the hips, and ears above the shoulders. The chin should be in a neutral position with the crown of the head as the uppermost point. At rest, the tongue maybe resting on the alveolar ridge or behind the bottom incisors and the jaw should be released. Postural adjustments should not produce stiff movement but should allow for relaxation within a position. Abnormal postures that negatively influence efficient voice production may include, but are not limited to: posteriorly tilted hips, a c-shaped spine, arching the lower back, high shoulder placement, rounded shoulders, forward chin placement, elevated chin placement, clenched jaw, or retracted tongue. Small adjustments made in posture may allow the larynx to relax in the anterior neck, permit easier breathing, and subsequently result in more coordinated voice production.

**Articulation**

A global assessment of articulation should be completed judging clarity and accuracy of articulatory movement for intelligible speech production.

**Prosody**

Prosody may have a subtle affect on voice production and should be assessed generally paying attention to the rhythm, fluency, rate, pauses, and intonation or inflection patterns used.

**Muscle tension**

Muscle tension can have an adverse affect on voice production causing vocal fatigue, pain, or changes in the ease and quality of voice production. Locating these areas of tension is vital in breaking patterns of tension and retraining efficient muscle patterns. Box 1 provides examples of general and specific areas where tension may occur.

Laryngeal palpation provides valuable information regarding specific areas of tension that may include the suprahyoid area, the strap muscles, and other related structures. The base of tongue should also be palpated to assess the presence and degree of tension. Digital manipulation and laryngeal massage of the extrinsic laryngeal musculature can provide the clinician with valuable information regarding tension. As demonstrated by Nelson Roy, manual laryngeal musculoskeletal tension reduction may yield immediate improvement in vocal quality or an identifiable release in laryngeal tension [7]. These changes are useful in providing the patient with an identifiable vocal change or release of tension and may indicate the patient’s responsiveness to therapeutic intervention.

**Oral mechanism examination**

A general assessment of oral and facial structure and function should be completed to rule out abnormalities or asymmetries in strength, range of
motion, and coordination that may impact functional communication. Structures include the face, mouth, dentition, tongue, and hard and soft palate. Abnormalities may indicate neurologic problems that warrant further evaluation.

**Trial therapy**

During the initial evaluation, a period of trial therapy should be completed using facilitators to improve ease and quality of voice production. The facilitators are used to assess the patient’s stimulability for improvement in voice production. Throughout the trial therapy period, the clinician attempts to provide the patient with a demonstration of possible improvement in voice production that should in turn increase motivation and feelings of therapeutic success. While completing facilitating techniques the clinician should gain information about the patient’s self-awareness of existing habits and of changes in voice production that may occur. Judgments can also be made by the clinician about the patient’s ability to learn new techniques, their willingness to comply with voice therapy, and the overall appropriateness for therapy. A statement of prognosis for outcomes through voice therapy should also be made.

<table>
<thead>
<tr>
<th>Box 1. Identifying areas of tension</th>
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<tr>
<td><strong>Tongue</strong></td>
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<tr>
<td>Anterior</td>
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<tr>
<td>Base of tongue</td>
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<td><strong>Jaw</strong></td>
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<td>Masseter</td>
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<tr>
<td>Temporomandibular joint</td>
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<td><strong>Laryngeal tension</strong></td>
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<tr>
<td>Intrinsic laryngeal muscles</td>
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<tr>
<td><strong>Anterior/posterior neck</strong></td>
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<td>Strap muscles</td>
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<tr>
<td>Suboccipital area, posterior cervical muscles</td>
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<td>Sternocleidomastoid muscle</td>
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<tr>
<td><strong>Shoulders</strong></td>
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<tr>
<td>High shoulder posture</td>
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<tr>
<td>Tightness/stiffness</td>
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<tr>
<td>Winged scapulae</td>
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<tr>
<td><strong>Upper chest</strong></td>
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<tr>
<td>Anterior/posterior chest muscles</td>
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<tr>
<td>Clavicular area</td>
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Impressions/recommendations

A complete voice evaluation provides the clinician with baseline data regarding voice production and the patient’s view of his or her voice disorder, in addition to allowing the speech-language pathologist to develop an impression of the cause or contributing factors in the cause of the voice disorder. The review of vocal hygiene, vocal demand, and overall voice use provides the clinician with a place to begin educating the patient about his or her voice. Although the trial therapy portion identifies facilitators for improved ease or quality of voice production, it also provides an appropriate starting point for therapeutic intervention.

When a general impression has been formulated by the clinician, it should be discussed with the patient. The clinician should indicate to the patient whether a course of voice therapy is recommended and what the expectations for follow-up sessions should be. The goals of therapy should then be discussed with the patient and consideration should be given at that time to the patient’s personal goals. Once the goals are delineated, other referrals may be made, including singing intervention, physical therapy, and so forth. It should be clear to the patient the expectations for therapeutic intervention, including clinician recommendations; the approximate length of the therapy in months, weeks, or sessions; and how often the sessions should be scheduled (weekly, biweekly, monthly). The patient also should be aware that home practice is a crucial part to success in therapy. The clinician teaches the patient tools and provides support to improve vocal efficiency and carryover of efficient voice use. It is the patients’ responsibility to attend sessions, complete home practice, and work to carry over efficient voice use in their everyday lives, with the clinician’s guidance so that therapy goals can be met and independence in efficient voice use can be achieved.

Therapy

Initially goals for therapy must be set forth. When treating the professional voice user the ultimate long-term goal is to produce an excellent speaking voice. The means to reach this goal is to increase vocal efficiency during speaking. The therapy techniques that are presented can be used to address behavioral voice problems that may include organic or structural changes that have taken place on the vocal folds.

Currently, in the speech pathology literature, therapy outcomes data are limited. The therapy techniques discussed in this section are effective based on clinical experience. Research has been referenced throughout this chapter as appropriate. Further outcomes research is still needed in this area, however.

Therapy begins with educating the patient. A brief overview of the anatomy and physiology of voice production should be introduced and discussed with the patient; including coordinating breathing, phonation, and
balancing oronasal resonance. This explanation should provide the patient with a foundation for understanding voice production and the primary focus of voice therapy. Vocal hygiene should be addressed and improved to eliminate vocal stressors and promote an optimal environment for improving vocal ease and quality. Furthermore, the voice user must be made aware of vocal habits that promote abuse or misuse of the vocal mechanism and should be provided with alternatives to abusive vocal behavior.

Voice conservation strategies should be taught to the patient in an attempt to manage voice use on a daily basis. Vocal exercises should then be introduced and practiced to begin retraining muscle patterns for voice production. The vocal exercises work to maximize efficiency of the vocal mechanism and promote carryover of targeted voice use into daily activities. Body and self-awareness should be targeted from the onset of therapy to promote carryover of the efficient voice learned during therapy.

Areas of tension and postural misalignment can have an adverse effect on efficient voice production. Areas of muscle tension were identified during the initial evaluation and should be addressed throughout therapy. The patient should be taught a daily routine for stretches and massage. Table 2 provides examples of exercises to target specific areas of muscle tension.

Laryngeal massage may be taught to the patient and completed independently, outside the therapy setting. Postural alignment should also be

<table>
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<tr>
<th>Sites of tension</th>
<th>Sample exercises (partial list)</th>
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<tbody>
<tr>
<td>Tongue</td>
<td>Tongue stretches</td>
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<td></td>
<td>Manual tongue stretch</td>
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<td>Base of tongue</td>
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<td>Jaw</td>
<td>Massage</td>
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<td>Jaw stretch</td>
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<td>Tension/relaxation awareness exercises</td>
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<tr>
<td>Laryngeal Tension</td>
<td>Digital manipulation of the suprahoid area and thyrohyoid muscle</td>
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<td>Breathy, sighing</td>
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<td>Gentle scales and glides</td>
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<td>Anterior/posterior neck</td>
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addressed with special attention given to hip angle and shoulder and head placement. Slight misalignments in posture can cause increased muscle tension. For example, elevated chin placement tightens laryngeal and neck muscles or an arched lower back makes relaxing the abdomen for lower abdominal breathing difficult.

Facilitators for breath control and support

Because respiration is the power source for phonation, the patient must be taught to balance inspiratory and expiratory muscles for efficient breathing. Exercises for breath management may start with a simple explanation of the respiratory system. This explanation may include a description of the expansion of the lungs and diaphragm with subsequent expansion of the rib cage and abdominal area during inhalation. As exhalation takes place these areas begin to slowly deflate. Expiratory muscles may be engaged but should not be hyperfunctioning. The patient must understand that it is possible to coordinate breathing and vocalization without hyperfunctional muscle use.

Appropriate terminology should be used when teaching a new breathing pattern secondary to learned responses that many adults have to phrases such as “take a deep breath.” When a patient is asked to do this, the stomach pulls in, the shoulders and chest rise and the patient holds his or her breath. Phrases such as “expand for inhalation” versus “take a deep breath” and “release/deflate for exhalation” or “engage the abdomen during exhalation” rather than pushing or pulling in may be used. In addition, the image of a newborn baby during quiet breathing with the belly rising on inhalation and falling on exhalation may elicit understanding of the target breathing pattern.

While establishing a more efficient breathing pattern, the patient may be placed in multiple positions to experience the targeted feeling of expansion during inhalation and active deflation during exhalation. Positions may include lying on the floor in the supine or prone position and concentrating on expansion of the lower rib cage and abdomen during inhalation and then slowly releasing air during exhalation. These two positions, with the help of gravity, provide tactile feedback during expansion and deflation. They also aid in decreasing shoulder and upper thoracic movement while breathing. These strategies alter respiratory function, however, and should be used cautiously and with knowledge of their purposes and limitations. Another useful technique is instructing the patient to bend over at the waist with arms extended to a chair or table so that his or her back is parallel with the floor. The patient is instructed to expand the abdomen during inhalation and feel the abdomen actively deflate during exhalation. These breathing techniques and positions are not meant to be sustained but to increase body awareness of an efficient pattern of breathing that can be applied during daily activities. As the patient and clinician work through the
therapeutic hierarchy and gradually introduce simple to complex exercises the patient should be instructed to use the new breathing patterns for short periods multiple times throughout the day while breathing quietly and also while talking, as appropriate.

Facilitators for increasing airflow during phonation

Once an efficient breathing pattern can be replicated, breathing and voicing should be paired together, cueing the patient to produce voicing during exhalation. It is important that the patient understand that inhalation before phonation is as important as releasing air during exhalation to produce phonation. To achieve appropriate airflow during phonation, muscle hyperfunction must be eliminated from the vocal tract by various exercises.

The yawn-sigh may be used to promote active inhalation while decreasing muscular tension in the throat. It also creates increased oral space by lifting the soft palate. The increased oral space and sensation of open throat should be maintained during exhalation while producing a sigh. The patient may be cued to place the tongue in a relaxed position behind the bottom incisors to maintain oral space. When the targeted yawn-sigh can be replicated consistently, the yawn can then be down-sized to an open-mouthed inhalation and voicing during exhalation may be shaped into words, phrases, and so forth.

The stretch and flow therapy technique, originally developed by R.E. Stone, focuses on increasing ease and quality of voice production by increasing airflow during phonation. The patient is asked to use a strip of tissue draped over his or her finger to provide a visual cue for airflow. The patient is instructed to blow a passive airstream onto the tissue, which should feel easy. Confirm this feeling with the patient. Once a consistent, passive airstream is achieved, the patient is instructed to add his or her voice on a /u/ vowel while maintaining the airstream. The patient should produce a smooth, air-filled, easy voice. This voice may sound slightly more air-filled than normal. The initial goal is to slightly overexaggerate the airflow during the exercise, so ultimately the ease of voice production is maintained and airflow can be normalized. Each trial should be modified until the targeted voice is achieved. The air-filled, easy /u/ is then used as a facilitator into words, phrases, sentences, and so forth, through the therapeutic hierarchy. When the patient can produce the targeted voice consistently using the facilitator, its use should be gradually eliminated until the targeted voice can be produced consistently independent of the facilitator.

Lip trills or tongue-out trills are other facilitators to coordinate airflow and phonation. For lip trills, which are made using airflow to vibrate the lips, the patient is instructed to expand during inhalation and produce a lip trill with only airflow while exhaling. If this is difficult the patient may place his or her index finger on each cheek and slightly press forward releasing any lip tension. The patient may also be cued not to clench his or her back molars together. When the patient is consistent with production
of the lip trill with air only, he or she is instructed to add voicing. Consistency should be developed on one pitch and through a range of pitches. Once this is completed, the lip trill may be used as a facilitator in initial /br/ words, phrases, and so forth. Similarly, with the tongue-out trill the patient should relax the tongue over the bottom lip, expand during inhalation, and produce a tongue-out trill without voicing during exhalation. This facilitator requires that the tongue and jaw be relaxed and airflow coordinated to produce the targeted tongue-out trill. When consistency is achieved, voicing should be added and developed at one pitch and through a range of pitches. The tongue-out trill can then be used as a facilitator into open vowels, words, phrases, etc. When the targeted voicing is achieved the use of the facilitator should be faded out.

When evaluating coordination of airflow and phonation, hard glottal attacks (abrupt adductions of the vocal folds on words with an initial vowel) should be addressed. Voicing should be initiated with airflow rather than abrupt adduction of the vocal folds. This issue can be addressed by targeting coordination of airflow and phonation. Easy onset exercises should be completed beginning with discrimination tasks so the patient is able to identify hard glottal attacks. Minimal pairs should then be used (ie, hear/ear, hat/at). The patient should be made aware of the abduction of the vocal folds during an /h/ and their closure during the voiced cognate. Cueing may be required to ensure inhalation before each trial for optimal air supply throughout voicing. The patient is then instructed to maintain the open feeling during the /h/ into the voiced cognate without producing an /h/ sound. Complexity should be increased as appropriate. The above-mentioned exercise addresses vowel-initiated words that begin a word or group of words to be said using one breath. When a vowel-initiated word is found within a breath group, linking should be used. Linking is used to connect the last sound of the word previous to the vowel-initiated word. For singers or musicians it may be described as tying the words together, just as notes on the staff may be tied in legato.

**Facilitators for oral resonance**

To achieve an optimal balance of oronasal resonance, a relaxed vocal tract must be maintained in addition to maintaining breath support and appropriate airflow during phonation. In many hyperfunctional voice users, it is difficult to achieve forward tone focus secondary to reduced space in the oral cavity that may be caused by increased tongue or jaw tension. To increase oral space it may be beneficial to increase soft palatal lift, address jaw tension through stretches and massage, and decrease tongue retraction through stretches and tongue-relaxation exercises.

Resonance exercises may include the use of a hum to achieve improved balance of oronasal resonance. The patient should be cued to maintain oral space, which may be achieved by creating space in between the back
molars to release jaw tension and maintaining relaxed tongue placement behind the lower front incisors and away from the roof of the mouth. The patient is instructed to inhale and exhale while producing a hum, or hum-sigh on a descending glide, with the lips barely touching. The patient’s attention should be brought to the targeted frontal tone focus and buzz on the lips. This buzz can provide tactile feedback for the patient in working to maintain frontal focus while increasing complexity of trials. If the patient has difficulty achieving a hum without pressing, he or she may be cued to release air through the nose and maintain a consistent airstream. When the targeted hum is achieved consistently, it should be used as a facilitator into vowels, words, phrases, and so forth. Eventually use of the facilitator should be minimized and then eliminated.

Honking is used as an effective facilitator for developing awareness and maintenance of balanced oronasal resonance. Honking is completed by pinching the nose while phonating on any vowel. The patient is cued to allow the sound to resonate in his or her nose and release airflow through the mouth. Tactile feedback should be provided with vibration or buzz at the nasal bridge. When the patient is able to achieve consistent voicing and awareness of the buzzing, words and phrases may be spoken using the honking as a facilitator. The word or phrase may be spoken while occluding the nose and then repeated after releasing the nose maintaining airflow and frontal focus of the sound production. When consistency of voice production is achieved, the use of the facilitator should be gradually eliminated.

There are multiple other resonance exercises, including the use of the /f/ and /v/ or /s/ and /z/ sounds. This exercise, as with others mentioned, combines the use of abdominal breathing, use of a continuous airstream, and frontal tone focus. Initially, the /f/ or /s/ sound is used to establish a consistent stream of air coming past the lips. The patient is instructed to expand and make an /f/ with the back molars parted and the top teeth barely touching the bottom lip. Following the trial, confirm the feeling of air past the lips. The patient is then instructed to use the same airflow and breath support and produce a /v/ sound. A buzz should be felt on the lower lip during this trial and should be confirmed with the patient. If the patient has difficulty achieving the buzz, recheck jaw tension and oral space. Production of a /v/ sound should become consistent and then may be used as a facilitator into /v/ words, phrases, and so forth. The /v/ may then be used as a facilitator into words and phrases that do not begin with /v/. Use of the facilitator should eventually be faded out.

There are four elements of voice production: respiration, phonation, resonance, and amplification. There are multiple facilitators that target each element. Choosing an appropriate therapeutic facilitator can be challenging. Clinical judgment should be applied when choosing therapeutic techniques and modifications should be made for patients as needed. When choosing a facilitator, consider the patient’s primary complaints, the perceptual and acoustic evaluation of his or her voice, and the physiology of the patient’s
current voice production versus the targeted efficient voice production. The clinician should be aware of the benefits and limitations of each facilitator and choose appropriately to maximize the patient’s voice output and potential for improved voice production.

Summary

There are multiple factors that affect voice production. When evaluating and treating professional voice users who have voice disorders, these factors must be taken into careful consideration. Expert listening and management skills must be used while staying within the scope of practice as a speech-language pathologist. A multidisciplinary approach to the care of professional voice users is crucial to care for this population. Professional relationships should be cultivated to maximize care for the patient and promote continued learning in our respective fields. Each voice user is unique and the therapy plan and treatment should be treated as such. When developing a therapy plan, the voice user's previous experience should be taken into consideration and addressed in therapy, as appropriate.

Further readings


References


