In my everyday communications, I’m not a particularly loud person, but as a singer I’ve always been a belter. Throughout my childhood and teenage years, I closed myself into my room daily and sang along with Pat Benatar, Bonnie Tyler, Olivia Newton-John, and ABBA for hours at a stretch. Oh yes, my parents were quite tolerant. Since I’d been singing as long as I could speak, it never occurred to me that what I was doing was in any way unusual or athletic. All I knew was that it felt good!

Now that I’m a voice training and rehabilitation professional, I understand how it was that my body developed the ability to cope with that intensity of singing at that young age without injury. The answer lies in some basic principles of athletic strength training. These principles are useful for any singer to understand, particularly those engaged in singing styles requiring significant strength. They are crucial, however, in understanding training for strength in young singers.

PRINCIPLE 1: MUSCLE BUILDING TAKES TIME

Both speaking and singing involve applying pressure to the vocal folds. The air from the lungs travels up the trachea to the closed vocal folds and applies pressure to them until they open to let some air through, thereby releasing the pressure. Then the vocal folds flap shut and the pressure builds again. This is the cycle of vibration.

In healthy singing, there is a balance of pressure that allows the vocal folds to build pressure and vibrate without the addition of excess effort from muscles such as the suprahyoid complex, the pharyngeal constrictors, and the interarytenoids. The addition of inappropriate muscle activity results in compression of the vocal folds against each other, which increases the risk of injury. In the terms used by athletic trainers, there is such a thing as proper “form” in singing exercises.

What athletic trainers understand is that an exercise loses its form if the muscles are pushed beyond what they are capable of doing at a given point in their training. When an exercise loses proper form, likelihood of injury increases and motor learning is compromised. Therefore, exercisers are started with a weight that is challenging, but which allows them to retain proper form. Over time, progressively more weight is placed on muscles as they gain the capacity to sustain it with proper form.
The same principle can be applied to singing, in that development of a strong lower register (mechanism 1 [M1] “chest register”) occurs gradually, beginning with notes that are easily accessible. Then by doing what I call “playing with the edges,” the muscle becomes capable of sustaining greater pressure while maintaining good form. Through this increased capability, additional notes become available.

In my youth, I had been singing progressively more challenging music, which demanded increasing weight and pressure, over a number of years. I started with Marie Osmond and moved through Olivia Newton-John on my way to Pat Benatar and Bonnie Tyler. By the time I was an early teen, the muscles responsible for singing were prepared to sustain relatively high levels of pressure without losing their form.

**PRINCIPLE 2: WORKING TO THE EXTENT OF THE MUSCLE’S CAPACITY INCREASES STRENGTH**

In exercise physiology, there is a principle called overload that is credited with muscular adaptations that increase strength. Overload occurs when an exerciser works a muscle (in proper form) to the point of fatigue. In experiencing the decrement of strength that comes with fatiguing the muscle, the body adapts and strengthens the muscle in preparation for sustaining that level of pressure again in the future.

In this regard, vocal training diverges somewhat from general athletic training. For one thing, the muscles in the throat are designed to be indefatigable. After all, these muscles are not just responsible for speaking and singing, but for regulating airway protection and swallowing as well. If they tired easily, we’d be faced with a threat to our survival.

Nonetheless, good singing training involves exercising voices to the limits of their ranges, stretching muscles for higher pitches and contracting muscles for lower pitches. Changes in loudness require training of coordination for isometric muscle contraction as well (contraction of a muscle without changing its length). Consistency in presenting these challenges to the muscular system that supports the voice educates the body in regard to the level of strength it needs to maintain.

In terms of my own childhood crooning, I was maintaining a relatively contracted state of the thyroarytenoid muscle for extended periods of time, given the amount of time I spent in M1 “chest register.” The contraction was alternated with intense stretching when I shifted from ABBA’s “Take A Chance On Me” (centered around B4) to Olivia Newton-John’s “Xanadu” (hitting a D6 in M2 “head register,” at the end of the song), encouraging muscular adaptations to occur.

**PRINCIPLE 3: MUSCLE CONDITIONING REQUIRES MAINTENANCE**

For athletic training to be successful, one must maintain a certain level of consistency in terms of training. We are all familiar with stories of the middle-aged “weekend warrior” sports enthusiasts who report to work on Monday with varying amounts of Icy-Hot, Ibuprofen, and ThermaCare. As tempting as it is to chalk these injuries up to age alone, the truth is that lack of consistency in training is the more likely culprit. One can’t sit around all week and then slam into the muscles on Saturday hoping they remember what to do.

In singing, the training is frequent practice. In order to build and then maintain the ability to perform high strength singing, muscles must be continuously worked so they maintain the ability to sustain the levels of activity required of them. In typical athletic training, one needs to work out three to four times a week to maintain muscle strength, more to build additional strength. We don’t have such specific guidance in terms of the vocal mechanism, but we can start with the idea of four times a week. Then add to that the fact that a more conditioned muscle (i.e., one that doesn’t fatigue easily) requires more exercise to build and maintain its level of function (e.g., those darn indefatigable throat muscles), and it becomes clear why most singers find they are at their best only with daily practice.

Singing daily when I was a kid? No problem. I had that totally covered.

**PRINCIPLE 4: INJURY HAMPERS PROGRESS—RESPECT YOUR BODY’S CURRENT LIMITATIONS**

Let’s consider the weekend warriors again. They arrive to work on Monday in pain. There is then little they can do over the week to improve the condition or strength of their muscles because healing has to take place. Saturday
rolls around again and the injury is reinforced. It doesn’t take a rocket scientist to recognize that this is a recipe for deterioration of performance and capacity; there is no training benefit to be gained in injury.

In singing, injury is complicated because when singers are injured, it is not typically the muscle itself that suffers, but the soft matrix of the lamina propria of the vocal fold and the basal membrane zone where the epithelium and the lamina propria meet. Injury to these tissues results in lesions, scarring, and other potentially permanent damage to the part of the system that actually produces the sound wave. In singing, Pain equals No Gain, so it is unwise to push beyond what the mechanism can sustain.

I often joke that even when I was young I was destined to be a voice trainer. Instinctually, I knew I should not feel (what I termed) “fuzzy” in my throat after singing. So, I actually spent time and effort figuring out how to sing “Holding Out for A Hero” three times in a row without feeling fuzzy. I persistently experimented with ways of decreasing the amount of squeezing I was feeling and minimizing the pressure it took to get the sounds I was looking for. Using my dad’s reel-to-reel recorder, I got feedback on my progress.

**PRINCIPLE 5: CHILDREN NEED PROFESSIONAL GUIDANCE**

Fortunately for me, I was able to guide myself toward solutions that were productive for the development of my vocal strength without injury. There were at the time no teachers who were: a) willing to teach a child as young as I was; b) willing to teach rock singing. So, I was truly on my own. If I had not been skilled in coming to those solutions for myself, I might have turned into a vocally damaged adult instead of a professional singer and teacher.

Sadly, in terms of singing, too many young children continue to be left to their own devices. Those who are not able to glean physiologically healthy ways of getting the sounds they want are often the ones I see in my clinic after the damage is done. Concurrently, too many teachers balk at the idea of helping kids develop the strength they need to sing in these styles convincingly and without vocal damage. It is my hope that with the recent enthusiastic expansion of teachers’ knowledge in regard to the application of exercise physiology and motor learning to singing training, the fear of helping children maximize their vocal strength will subside.

It is both admirable and appropriate that teachers of singing be protective of students’ vocal health. Settling into a mythology that strength training should not be undertaken simply because there is risk of harm, however, does a disservice to those students whose passion drives them to be loud. It cheats their inner voices by forcing them into vocal styles they are not connected to. It cheats their physical voices by leaving them weak and prone to injury when they go ahead anyway and sing repertoire that requires that strength. Becoming educated in the principles of athletic training and applying those principles to our knowledge of the voice positions us to be a powerful influence on all singers, not just the young, in the development of both beauty and strength for a lifetime of vocal expression.

**Barbara Wilson Arboleda** is a speech-language pathologist and singing voice teacher, and currently President of the Boston Chapter of NATS. She is honored to have collaborated with Robert Edwin for their pediatric pedagogy DVD, The Kid and the Singing Teacher.

Barbara graduated from the MGH Institute of Health Professions at Massachusetts General Hospital, completing her specialty rotation in voice disorders at the Massachusetts Eye and Ear Infirmary. Prior to founding Voicewize, she provided voice pathology rehabilitation at Beth Israel Deaconess Medical Center, the Massachusetts Eye and Ear Infirmary Voice Lab, and Braintree Rehabilitation Hospital.

In addition to her clinical work, Barbara has been a singer and actor for more than 15 years. She studied voice at the New England Conservatory, through consortium with Simmons College, and completed an acting program with Shakespeare and Company in Lenox, Massachusetts. She is a certified master teacher of the Estill Voice Training System and has a Level 3 certification in Somatic Voicework™: the LoVetri Method. She is committed to the development of an integrated voice pedagogy that honors the principles of motor learning, as supported by the work of Dr. Katherine Verdolini.