

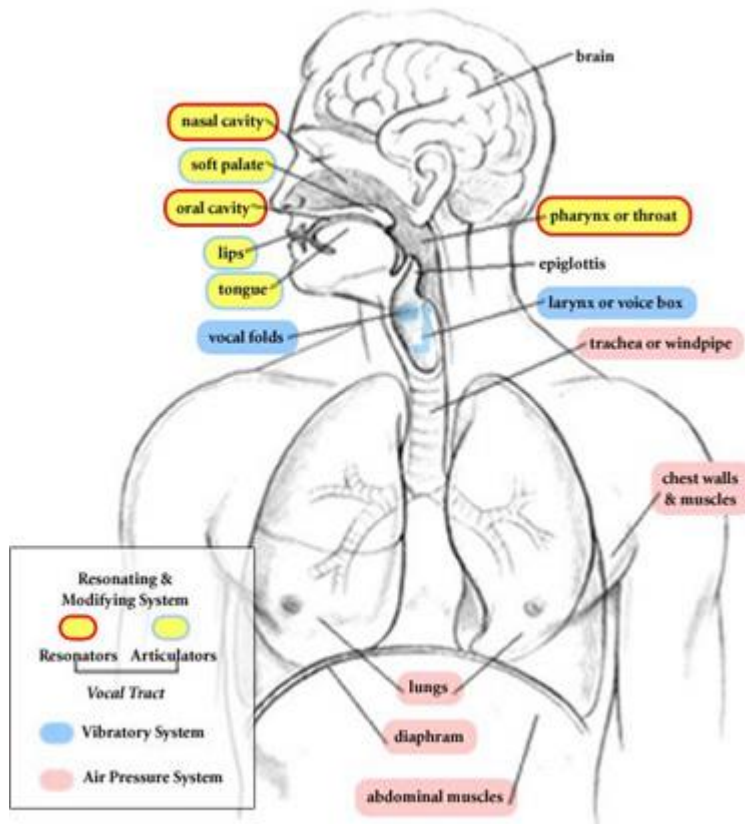
Your Voice, Your Instrument

It is vitally important that you understand that your voice is your instrument. As such, you should care for it the way any musician would care for their instrument. You also should understand your voice and how it works, so that you can take an active role if anything happens to it. Remarkably, there is little information to guide the professional voice user as to the best regimen for voice care. We have developed a system that will help you to use your voice and protect it, keeping your instrument healthy.

To understand this system, you must understand how your voice works. Armed with this understanding, you will better be able to recognize any problems you may have.

Voice production is divided into three major categories:

- The power source
- The vibrator
- The resonator

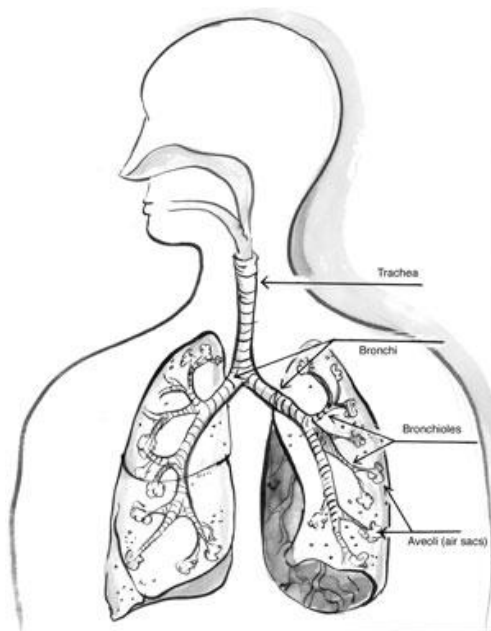


Your power source is the breath that supports your sound. This is the driving force, so much so that anything that affects your breath (or your lungs) can completely eliminate your ability to produce sound. Asthmatics are particularly aware of this but even non-asthmatics can understand this concept. Take a shallow breath and attempt to shout. Now, take a deeper breath and attempt to shout. Clearly it is easier with a deeper breath. Without enough air to support your sound, it will fall flat and quiet.

Your breath is driven by several factors:

- Your lungs
- Your diaphragm expansion
- Your abdominal support

Your lungs must be healthy in order to produce the breath you need. Your diaphragm is the muscle that contracts to help expand your lungs. A slow, deep breath with deliberate diaphragm expansion will give you more breath to work with. You can use this breath to produce a low-volume, long-duration sound or project a loud sound for a shorter amount of time. That is the trade-off you will always make in voice production. But what helps you make this trade-off? What do you use to either push volume or push duration? It is your abdominal support. Your careful control of your abdominal muscles will allow you to push more or less air, in accordance with the sound you want to produce. It is easy to see how understanding the interplay of these three factors will allow you to control the volume and duration of your sound production.

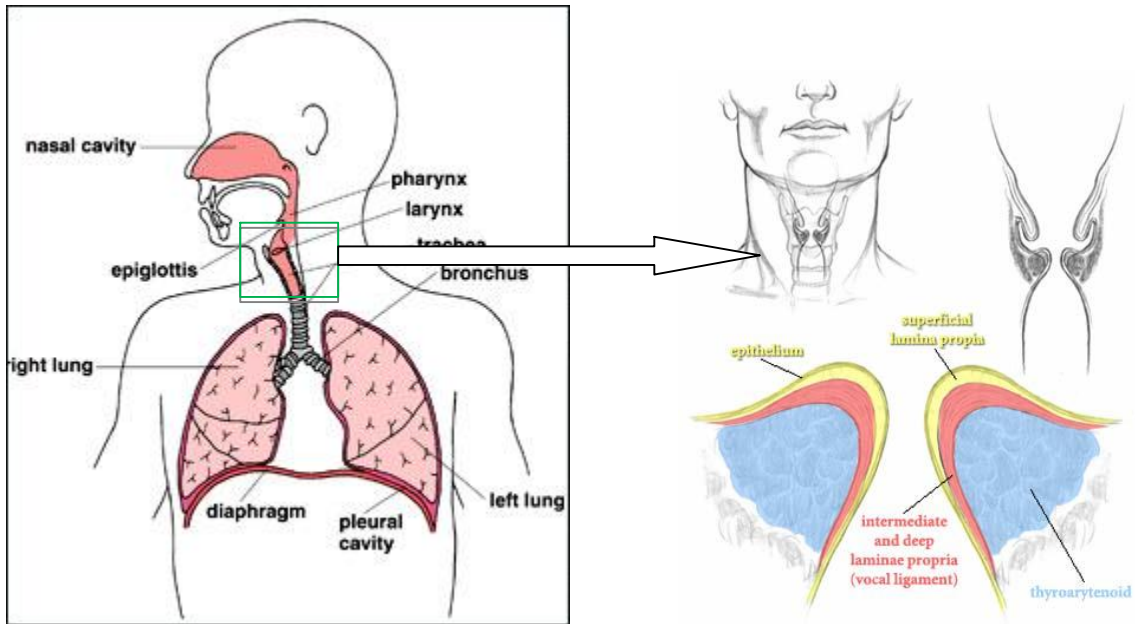


So now that we have made the decision to produce a sound of a certain volume and duration, we need to work on understanding what determines the quality of the sound. At this point, what you have produced has no sound... it is just exhaling. So let's learn about where the sound comes in.

The first level of sound production occurs at your vocal folds. It is the vibration of your vocal folds that causes vibrations in the air that your lungs have just generated and your abdominal muscles have pushed. This vibration will later be shaped by the resonators to add tone but before this can be done, the vibrations must be created in a regular and smooth fashion. The vocal folds are

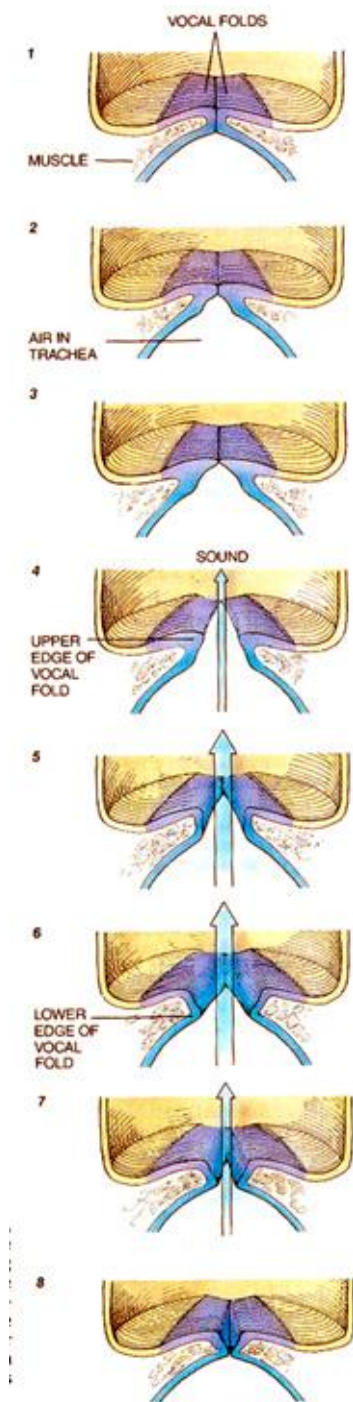
the source of the sound quality; disorders at this level cannot be fixed by the resonators farther down the line.

It is clear, then, that this vibration must be of a certain quality so how do you create this regular vibration? The anatomy of the vocal folds is complex and is solely responsible for vibration production.



The figure on the left is what you already understand, the power source (the lungs). You can see how the lungs will push air up through a tubular structure, called the trachea. The figure on the right is a magnified view of what happens as air leaves the trachea. It passes through your larynx (voice box) where your vocal folds are situated. The diagram shows the vocal folds in cross section (i.e., as if you are viewing the larynx from straight ahead).

It is the cross-sectional anatomy that leads to function. The epithelium is the outermost layer. It is thin and moist and resembles the lining on the inside of your cheek. Immediately deep to this is the superficial lamina propria. This is composed of a gelatinous material. This layer needs to be gelatinous so that the epithelium can slide over it, the way plastic wrap would slide over jelly. When you attempt to speak or sing, your lungs push air past your vocal folds, which sets them into vibration. The frequency of vibration determines the pitch at which you will speak, and can be up to several thousand vibrations per second! As you can see from the diagram below, the vocal folds vibrate in a very orderly fashion, progressing from bottom to top.



Any problem of the vocal folds severely affects your voice. Scars occur when the superficial lamina propria disappears, usually due to a vocal injury. The epithelium then attaches to the vocal ligament and, then, it can no longer flow and vibrate the way it should. That is how vocal scarring affects your voice. In a perfect system, though, the air from your lungs sets the epithelium in motion and the gelatinous superficial lamina propria allows it to move smoothly.

One of the most critical elements that allows this to happen is the midline meeting of your vocal folds. Any space between your vocal folds will enable air from your lungs to escape through. This presents two problems. The first is that you waste the air from your lungs, which escapes through the gap between your vocal folds. This tends not to be as big of a problem unless the space is quite large. At that point, you will notice symptoms of breathlessness and voice fatigue. Smaller gaps are problematic for another reason, though. In order to set your vocal folds into vibration, pressure needs to be generated below the vocal folds. It is the balance of the pressure below your vocal folds against the tension of the vocal folds from the vocal muscles that creates fine tuning of pitch and volume. But with a space between your vocal folds, that pressure can't be generated. This will make it difficult to get an easy vibration and maintain a steady pitch.

However, even with all of these complex mechanisms perfectly in place, the sound your vocal folds make resembles the sound of air being blown through the mouthpiece of a trumpet. It is buzzy and without any real tonal quality. The resonators, the final step in voice production, give your voice the tone that you know and hear.

Your resonators are the parts of your airway that give all the richness and tone that make your voice musical and give it its individual quality and character. The nasal passages, the throat, and the mouth are air chambers that shape the sound and are the critical structures you train when developing the singer's formant. This is why, when you have a cold and your nose is congested, you lose a certain resonance to your voice. The sound can no longer bounce through your nasal passages and the tone becomes flat, and without richness.

Of course, the other structures in your upper airway are critical as well, but these are more important for articulation, or pronunciation. Your tongue, palate, and lips shape the sound that has by now resonated throughout your vocal tract, making them into understandable words.

It's important to realize, too, that singing and speaking in different languages results in different use of the structures we have discussed. For example, if you sing primarily in Italian, you are adept at relaxing your tongue, opening your throat, and supporting your breath. However, if after rehearsal you go home and speak Arabic or Tagalog or any number of languages with harder glottal attacks, you are probably not using the same excellent singing technique in your speech. This can actually cause injury in someone who is a perfect singing technician if they are not aware of their speaking habits. Awareness of how every aspect of your life affects your voice allows you to control for such things, keeping your instrument finely tuned and your voice at its best.