

Vocal Mechanics

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Overview

There are four primary components that make up 'the voice'. The following terms have been created as a way to make it easier to understand how 'the voice' works. Just like any other functioning system, these various elements contribute to great speech and sound when in healthy working order. 'Healthy' means not only physically healthy, but also the ability to coordinate the different elements.

The Pump

The Tank

The Voice Box

The Sound Box

Sinuses, Pharynx, Head

Larynx

Lungs

Abdominal Muscles



SOUND BOX

VOICE BOX

The TANK

The PUMP

Basic Definitions (see diagrams)

The Pump is a complex system of muscles, most often referred to in this introduction as the abdominal muscles, although other muscles in the back and legs often play a part. In short, the abdominal muscles support the voice best when they move inwards towards the spine when making a sound or exhaling, and outwards, increasing belly size, when inhaling. This simple action, also encountered in good yoga breathing, makes it possible for the diaphragm, (an involuntary sheet of muscle that separates the lungs from the internal organs and connects at the base of the ribs), to expand downwards so that sufficient air is taken into the lungs. If the abdominal muscles are held tight, then only shallow 'panic' breathing can occur. Sadly, most of the breathing population seems to suffer from tightly held bellies

resulting in shallow breathing. Specific exercises are given later to help improve and develop deep breathing for speech.

The Tank is a simple way of saying 'lungs'. And yet more involved. The rib cage expands and contracts. Some methods advocate that people 'lift their rib cage', which is in fact a misnomer. The rib cage does not lift. If it did, your shoulders would end up around your ears. The rib cage, however, expands out horizontally, underneath your armpits, as it were. In basic deep breathing, the rib cage expands after the abdominal muscles have extended as far as possible out in front of you. When the rib cage expands, the lungs fill up to their capacity. If the belly is held tightly, the rib cage may expand somewhat, but without being able to fill up with air completely, as only the upper portion of the lungs can be inflated.

The Voice Box is where the sound is initiated and is called the larynx (pronounced lair-inx, not lairninx!). The larynx is located in the throat, often referred to as the adam's apple. To find it, put your finger on the middle of your throat and swallow. The thing that moves up and down is the larynx. The box is comprised of little cartilages and bones, with muscles to match. The vocal cords themselves (there are two) form a 'V' shape when you are breathing, and when you speak or sing, come together in the center. When whispering (which should be avoided as it causes undue stress on the vocal cords), the vocal cords move towards each other about half way. The cartilages etc. move the vocal cords into these positions as well help the cords elongate and shrink to make pitch changes. The larynx also tilts and moves up and down. In order to make a great sound, you should avoid any manipulation of the throat or larynx. In fact, you should feel NOTHING in the throat when making a sound. If you do, there is something going on that needs to be addressed immediately.

The Sound Box is just that, the box where the sound vibrates. Humans have several areas in the neck and head that vibrate: the pharynx (loosely referred to as the throat), the nasopharynx (the section of the throat behind the nose), the sinus passages (that singing teachers often call 'the mask'), eustachian tubes, and yes, the cranium. Bones vibrate. Actually, when you make a sound, everything in your body vibrates, though the primary focus is on the neck and head. Try this as an experiment: while in the tub or swimming pool: go under water when you hear an airplane overhead. You can actually hear that plane while under water! How does the sound travel from several thousand feet above you to the water in your tub? Sound vibrations.

How Does it Work?

When you inhale correctly and completely for speech, the belly extends outwards, then the rib cage expands. The brain sends the message to the vocal cords to make a sound.

Simultaneously, the air passes up from the lungs through the wind pipe (trachea), at which time the vocal cords meet in the center and initiate the sound you pre-heard in your head.

The vibrations are echoed in the pharynx, nasopharynx, sinuses, mouth, etc. While you are making the sound, the belly continues to move in towards the spine at a steady even rate.

The sound then travels outside of your body to the listener (even if you have your lips closed, as in humming).

Is This an Over-Simplification?

Yes! The process of initiating a sound, making a sound, discontinuing a sound with the voice, how to make great sounds, maximizing breathing for speech and singing, etc., is a lifetime study. For the speaker, however, there are step by step guidelines and exercises for improved and great speaking. Stay tuned.