

The Second Breath of Life

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The first breath of life after birth is a dramatic and magnificent event. A newborn, which is programmed to develop high pressures within the lung by a pumping action of the muscles of the neck, some of which are used in the act of swallowing. A baby's lungs are simply pumped full of air to full expansion, followed by release of this pressure, which results in the characteristic cry. This cry is music to mothers' and doctors' ears, because it means that the baby can now breathe, and most likely will survive. This ability to inflate the lungs in this fashion, to a maximum inspiration, is never required again, unless the breathing muscles become paralyzed in some very rare states. Under unusual circumstances, patients can recover this ability to develop a full expansion of the lungs and chest if the muscles of the neck swallowing apparatus remain intact. Such a maneuver has been termed "**frog breathing**", and was learned by some in the polio era of a period that is fortunately now past.

The measurement of vital capacity has some similarities with a baby's first breath of life. The mechanism is **different**. It involves the use of the voluntary muscles to inflate the chest as **full** as possible, followed by a complete forced exhalation into a device called a spirometer. The amount of air that can be blown out of fully inflated lungs was originally termed the vital capacity, which literally means, the capacity to live. Indeed, reductions in vital capacity correlate with all cause mortality, which has been known for many years. The first second of the forced vital capacity is known as the **FEV₁**, forced expiratory volume in one second, which is a measure of flow, i.e., how fast the lungs can empty. Abnormalities in **FEV₁** identify patients at risk of COPD, heart attack, lung cancer, and stroke.

Many patients who smoke have symptoms of cough, shortness of breath, wheeze, and excessive mucus and have never had measurements of their vital capacity, or **FEV₁**. These two numbers are measured by a simple spirometer, which can be used to identify patients at risk, and to monitor therapy, as in COPD and asthma. Your physician should have and use a spirometer for this purpose. Thus, your second breath of **life**, i.e., a spirometric test, will help predict your outcome and indicate whether or not you have a disease that is undiagnosed and which requires treatment. Your second breath of life will help determine the length and quality of your life. Test your lungs. Know your numbers.