

## Why Do We Feel the Urge to Breathe?

This is an interesting tidbit about human physiology, although it applies more to free-diving than scuba.



Try this out: take a breath and try to hold it. Unless you practice this sort of thing, it won't take long before you feel the urge to breathe, that tugging in your chest. Where does that feeling come from?

Most people would guess that your body needs oxygen, and that it translates this need into a physical response urging you to breathe. This is close, but not correct. In fact, this reflex comes from the other half of the same cycle.

Breathing is a two part process, composed of an inhale and an exhale. The inhale brings fresh oxygen into your lungs, which gets absorbed into your blood and carried through your body. Meanwhile, blood is circulating back to your lungs, carrying carbon dioxide bi-product from your system. This carbon dioxide is released from your blood into your lungs, which is then expelled by an exhale. This process repeats for as long as you keep breathing.

The urge to breathe, then, doesn't come from the need for oxygen, but rather from a build-up of carbon dioxide. When you feel the need to breathe, you are actually feeling the need to exhale!

Try the experiment again: take a breath and try to hold it. This time, when you feel you need to breathe, try exhaling a little air gently. It helps, doesn't it?

My favorite way to try this is climbing stairs in a building. Anytime you work your body, you are generating carbon dioxide. Work the body harder, get more carbon dioxide. This is why your breathing escalates during exercise. When I feel myself running short of breath, I make a conscious effort to extend my exhales instead of just increasing my respiration rate. Even if your body is low on air, as long as carbon dioxide levels are normal, your diaphragm won't be stimulated to draw a breath.

This knowledge is useful for exercise. When you understand how this works, you realize that deeper breaths are not necessarily the answer to controlled breathing. Exhaling excess carbon dioxide is just as, if not more, important.