

## The Science Behind the Frolov Breathing Device

Exercising with the Frolov device utilizes the concept of resistance breathing. The device applies metered resistance upon inhalation and exhalation. As a result, it can improve lung capacity by approximately 25% (from 70% to 95%) for the average user. Increased lung capacity yields a higher oxygen intake with each inhalation.

However, increasing oxygen alone is not enough! In order to maintain the appropriate balance, carbon dioxide (CO<sub>2</sub>) levels must be raised also.

When you exhale through the device, a portion of the exhaled air stays in the beaker. There is more CO<sub>2</sub> in the exhaled air than in the atmosphere. Once you inhale through the device, the inhaled air contains higher levels of CO<sub>2</sub>. As a result, CO<sub>2</sub> blood levels increase, thus blood circulation is improved. In addition, it improves oxygen supply to the cells and you experience various health benefits as described in the Facial Meltdown blog about mouth-breathing and blowing off excessive carbon dioxide.

*Cell oxygen levels are controlled by CO<sub>2</sub> in the lung alveoli and by breathing. Hyperventilation, regardless of the arterial CO<sub>2</sub> changes, causes a carbon dioxide deficiency, which leads to low cell-oxygen concentrations.*

**Oxygen Transport** depends on breathing and:  
1. Vasoconstriction/vasodilation of blood vessels and  
2. The Bohr Effect, both of which explain the influence of hypocapnia (low CO<sub>2</sub> content in the blood and cells) on circulation and reduced oxygen delivery.

### **The effect of carbon dioxide in the blood:**

Hemoglobin can also bind carbon dioxide, but to a lesser extent, carbaminohemoglobin forms. Some carbon dioxide is carried in this form to the lungs from respiring tissues. The presence of carbon dioxide helps release oxygen from hemoglobin, known as the Bohr Effect. This can be seen by comparing the oxygen dissociation curves when there is less carbon dioxide present and when there is more carbon dioxide in the blood.

**The role of the Diaphragm:** A significant amount of Frolov's patented breathing method focuses on using diaphragmatic movement. When the diaphragm contracts during abdominal breathing, your belly expands like a balloon. This forces air into your lungs and pulls blood into your chest to return more blood into the heart, which then increases oxygen uptake.

See: (<http://www.normalbreathing.com/CO2.php>)

