

Breathing control for a person with healthy lungs vs. a person with COPD?

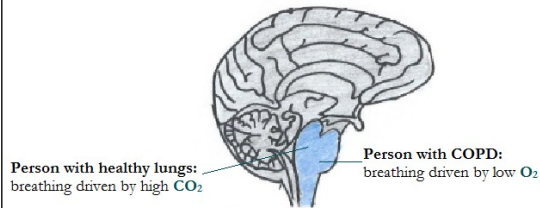


Figure 2. Essentially, the difference between a person with healthy lungs and person with COPD is that their breathing is controlled by different things. For both, the brain tells them to breathe. However, for COPD patients, low oxygen is what drives the breathing, so when the brain senses low oxygen levels, it tells the person to breathe. For people with healthy lungs, high carbon dioxide is what the brain senses and tells the person to breathe to get rid of the carbon dioxide.

pH scale

A pH scale ranges from 1-14, with 1-6 being acidic, 7 being neutral, and 8-14 being basic. The body is at a neutral pH of 7.4. Figure 3 shows examples of acidic, basic, and neutral items.

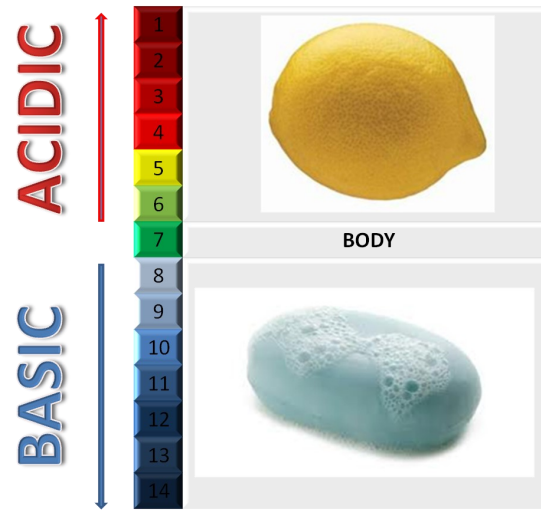


Figure 3. Examples of items that are acidic and items that are basic.

For more information

- ◆ **A.D.A.M. Medical Encyclopedia:** www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001153/
- ◆ **American Lung Association:** www.lung.org
- ◆ **COPD Help:** www.copdhelp.ca/en/home/

Disclaimer: This information is not providing medical advice, diagnosis, or treatment.

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COPD & CO₂/pH



What is COPD?

Chronic Obstructive Pulmonary Disease (COPD) is a lung disease in which the airways are obstructed, making it difficult to breathe. COPD is the most common lung disease, affecting over 12 million people in the United States. It is especially prevalent in the Mideastern portion of the United States, including states like Indiana, Ohio, Kentucky, West Virginia, and Tennessee.

Causes of COPD

- Tobacco Smoke
- Air Pollution
- Chemical fumes
- Dust

Signs and Symptoms?

- Excessive coughing (producing mucous)
- Wheezing
- Tightness in chest
- Shortness of breath

Treatments

- Stop smoking
- Prescribed medications
- **Home oxygen therapy**
- Surgery

How Normal Breathing Works

During breathing, a person inhales oxygen and exhales carbon dioxide. The body wants to have oxygen and to get rid of the carbon dioxide. For this reason, high levels of CO₂ in the body is what tells the brain to tell the body to keep breathing. This means that if a person has too much CO₂ in their body, they want to get rid of it, so they increase their rate of breathing. If they did not breathe, the CO₂ would build up in the body and make it too acidic (or have too low of a low pH). Please see Figure 1 for a description of what takes place.



Figure 1 .When carbon dioxide (CO₂) is in the body (on the left side of the arrow), it gets converted to H⁺(right side of the arrow). When the body has too much H⁺, the body becomes too acidic, which means that its pH is too low.

COPD and Oxygen Therapy

A person with COPD has a CO₂/O₂ composition that is the opposite of what a person with healthy lungs has. The COPD patient has high CO₂ and low O₂ in their blood. Because of this, they are driven to breathe by the low oxygen levels in their bodies. In the process of breathing, they do let out some CO₂.

When oxygen therapy is used by a person with COPD, the increase in oxygen may cause the person to decrease breathing. This is because the person's body relies on its own lack of oxygen to drive breathing. Giving yourself some oxygen causes the body to think, "You don't have to breathe as much because there is enough oxygen already." This causes the CO₂ to build up in the body, and the blood to become more acidic, which may harm a person. See Figure 2 for an explanation of the major difference between normal breathing and breathing when a person has COPD.