

## Common Myths Regarding Oxygen Therapy

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Have you ever wondered how many of the myths associated with medical therapy get started? This is especially true in the area of oxygen therapy. Although oxygen was first used as a therapeutic agent as far back as 1799, the modern era of oxygen therapy had to wait for the technology to be “invented” so oxygen could be safely and conveniently delivered to the home. For arguments sake, let’s say the modern era of home oxygen therapy began with the introduction of the first oxygen concentrators. This would put us at the beginning of the 1970’s. For the first time patients on home oxygen did not have to give up their garages to store the huge number of bulky and heavy cylinders of oxygen they required. Now that oxygen was becoming easier to supply to patients in the home, it’s not that difficult to see where some of the myths surrounding the use of oxygen got started. Let’s zero in on just a few of the most common myths and see if we can explain how they might have come into existence. Let’s start with the possibility of oxygen exploding.

You may remember from some chemistry lecture (way back) in high school about oxygen as a gas. You may even remember in a lab setting your teacher inserting a burning wooden splint into a small flask of oxygen. Remember how it flared up and burned so very brightly and intensely? Remember also that there was no explosion, no noise...in short no Ka-Boom! Oxygen does vigorously support combustion (burning), but it is not flammable...it simply doesn’t explode. So where does the myth about oxygen blowing up come from? It probably comes from the fact that oxygen tanks were commonly stored outside the hospital, but oftentimes in a sunny enclosure. We all know how hot it can get in the middle of summer, and the different gases in those large tanks are subject to various gas laws. It is certainly possible given the right circumstances that tanks of almost any gas could and did “explode” as the pressure in the tank increased with increasing temperature. That does not mean the *oxygen* exploded, but you can see how this might have been mistaken and then the mistake was simply propagated and uncorrected over the years. Unfortunately, there were also well documented cases of certain anesthetic gases such as Cyclopropane that *could* explode with something as small as a static spark. This added to the confusion and the net result was the myth about oxygen’s “explodability.”

This leads to discussion of another couple of myths. The first being that if a person wearing nasal oxygen was to do something as stupid as lighting up a cigarette, the oxygen in their body would likewise, explode. As I described above, this is

impossible. What is true is that there are hundreds of “oxygen flare-up fires” reported to the nations emergency rooms every year. Most of the time this results in a very embarrassed patient who has to explain to the doctor what they were doing smoking while on oxygen. Occasionally, the “Oxygen Flare” has much more serious consequences including severe damage to the trachea requiring full airway support. So you won’t “explode” while wearing your oxygen, but wearing your oxygen near a source of ignition (i.e. smoking) is almost asking for a significant (even life-threatening) problem to develop.

How about the myth of “knocking out your hypoxic drive.” The scenario goes like this. Carbon dioxide is well known to be the primary stimulus to breath. This is a great oversimplification, but it is technically close enough for our discussion. We all know that COPD also causes blood oxygen levels to fall as the disease progresses. When this happens we say the patient is “Hypoxic or Hypoxemic.” So if you have (primarily) COPD that has taken many years to develop, in many cases your carbon dioxide level will be slowly increasing due to the destruction of functioning lung tissue. However, the human body is very, very good at compensating for situations like this. In fact, we do have a back-up system to overcome this problem. We all have very specialized cells called chemoreceptors. They are located in the arch of the aorta and near the carotid arteries. They are continuously sampling arterial blood flow for the amount of oxygen in the blood. When they “sense” your blood oxygen is below a certain level (you are hypoxic), they send messages up to the respiratory centers in the brain, encouraging you to breath.

So here is where the myth begins. Assuming your carbon dioxide- to- breathe system is now ineffective, or even absent, the theory suggests you are now breathing due to your low blood oxygen level (hypoxemia). Well, if we give you supplemental oxygen and bring your low saturations back into the normal range, the backup stimulus to breathe will be knocked out. Hence the term, “knocking out your hypoxic drive.”

The problem here is the classic “theory vs. actual patient” experience. While it is theoretically possible for a patient’s hypoxic drive to be knocked out, in real clinical practice, it is so rare as to be virtually never seen. Don’t believe me, ask your pulmonologist, or respiratory therapist how many COPD patients in their entire careers they have actually seen have their hypoxic drive knocked out. If you think about it, oxygen is the *only* drug that is administered without a prescription for flow rate. When does this happen you ask, every time a first responder, EMT, or paramedic finds a “patient down.”

Quoting Dr. Tom Petty (and it doesn't get much better than that) from his book "Adventures of an Oxyphile" "Unfortunately, quite a few physicians believe or fear that oxygen use will cause retention of carbon dioxide. This is generally not true. The majority of patients using only a little supplementary oxygen just to correct the oxygen deficiency state, a saturation of above 90% but not greater than 96% will have no bearing on carbon dioxide level."

How about becoming addicted to oxygen? Well, since oxygen is essential to and for life, it would seem obvious that we are all addicted to oxygen. Oxygen is necessary for metabolism and the production and storage of energy. We wouldn't be able to do the things we need to do day to day without oxygen. This is one addiction that we all share equally. This myth may be generational, as many patients in their 6<sup>th</sup>, 7<sup>th</sup> or 8<sup>th</sup> decade of life grew up during a time where you didn't just take a pill to cure your ill! This is a noble path to take, but when it comes to oxygen, it just doesn't make good sense. Oxygen is a drug, and if you are an oxygen dependent patient, it is the most important drug you are taking. Oxygen is the only drug *ever* proven to extend life. Combine this with a regular program of exercise and there are almost no goals you can't achieve, if you keep them realistic and plan well for them.

Remember, that no matter how you are getting your oxygen, you must monitor your oxygen saturations very closely. Now that prices of digital pulse oximeters have come down to very reasonable levels, every oxygen dependent patient should own one and use them as intended. Think of oximetry as the 5<sup>th</sup> vital sign behind, heart rate, respiratory rate, temperature, and blood pressure. Because the body is so good at compensating for oxygen deficits, you can **not** just go by "how you feel!" You can be feeling pretty good while you are slipping into right heart failure. Use the tools that are now available to you to give you "tight control" of your blood oxygen levels, just like a person with Diabetes has "tight control of their blood sugar levels."

In summary, most myths and legends have some basis in fact. History is replete with examples of this phenomenon. But remember, if you are oxygen dependent, oxygen is *your* lifeline. If you have any questions about your oxygen therapy, the equipment, or how to use it correctly, by all means talk with your pulmonologist. Another great source of information is your hospital based or home care respiratory therapist. Don't let any of these myths prevent you from getting all the benefits modern oxygen therapy has to offer you. It is literally your life right?