Hyperbaric Oxygen Therapy

Other common name(s): hyperbaric medicine, hyperbarics, HBOT, HBO²

Scientific/medical name(s): none

DESCRIPTION

Hyperbaric oxygen therapy (HBOT) involves the breathing of pure oxygen while in a sealed chamber that has been pressurized at 1.5 to 3 times normal atmospheric pressure.

OVERVIEW

Research has shown HBOT is effective when used in addition to conventional treatment for the prevention and treatment of osteoradionecrosis (delayed bone damage caused by radiation therapy). There is also some evidence suggesting HBOT may be helpful as an additional treatment for soft tissue injury caused by radiation. There is no evidence that HBOT cures cancer. The US Food and Drug Administration (FDA) has approved HBOT to treat decompression sickness, gangrene, brain abscess, air bubbles in the blood, and injuries in which tissues are not getting enough oxygen.

How is it promoted for use?

HBOT is used in conventional treatment for decompression sickness and severe carbon monoxide poisoning. Decompression sickness, commonly known as "the bends," is an extremely painful and potentially dangerous condition that strikes scuba divers who surface too quickly and, occasionally, miners and tunnel builders who come up too rapidly. It can also affect fighter pilots who climb very quickly.

Claims about the alternative use of HBOT include that it destroys disease-causing microorganisms, cures cancer, alleviates chronic fatigue syndrome, and decreases allergy symptoms. A few supporters also claim that HBOT helps patients with AIDS, arthritis, sports injuries, multiple sclerosis, autism, stroke, cerebral palsy, senility, cirrhosis, Lyme disease, and gastrointestinal ulcers. Available scientific evidence does not support these claims. Because of that, the FDA has sent a warning letter to at least one manufacturer about promoting HBOT for unproven uses. The FDA considers oxygen to be a drug which must be prescribed by a physician or licensed health care provider to help treat illnesses or health conditions.

What does it involve?

HBOT can be done in single-person chambers or chambers which can hold more than a dozen people at a time. A single-person chamber (monoplace) consists of a clear plastic tube about seven feet long. The patient lies on a padded table that slides into the tube. The chamber is gradually pressurized with pure oxygen. Patients are asked to relax and breathe normally during treatment. Chamber pressures typically rise to 2.5 times normal atmospheric pressure. Patients may experience ear popping or mild discomfort, which usually disappears if the pressure is lowered a bit. At the end of the session, which can last from 30 minutes to 2 hours, technicians slowly depressurize the chamber.

After an HBOT session, patients often feel light headed and tired. Monoplace chambers cost less to operate than multiplace chambers and are relatively portable. Most health insurance policies cover medically approved uses of HBOT. Recently, Medicare and Medicaid have begun to cover them as well.

What is the history behind it?

In the early 1900s, Orville Cunningham noticed that people with some heart diseases did better if they lived closer to sea level rather than at high altitudes. He successfully treated a colleague with influenza
who was near death due to lung restriction, and later developed a hyperbaric chamber. After his attempts to use HBOT to treat a host of other conditions failed, the method was abandoned and his chamber was scrapped.

HBOT chambers were developed by the military in the 1940s to treat deep-sea divers who suffered from decompression sickness. In the 1950s, HBOT was first used during heart and lung surgery. In the 1960s, HBOT was used for carbon monoxide poisoning, and has since been studied and used for a number of health-related applications. It has been the subject of a great deal of controversy because of the lack of scientific proof to support many of the other uses for which it is suggested.

**What is the evidence?**

There is strong scientific evidence showing HBOT is an effective treatment for decompression sickness, arterial gas embolism (bubbles of air in the blood vessels), and severe carbon monoxide poisoning. It may also be useful as an additional method for the prevention and treatment of osteoradionecrosis (bone damage caused by radiation therapy), clostridial myonecrosis (a life-threatening bacterial infection that invades the muscle), and for helping skin graft and flap healing. Other evidence suggests HBOT may be helpful for less severe carbon monoxide poisoning, and for radiation-induced soft-tissue injury; anemia due to severe blood loss (when transfusions are not an option); or crushing injuries, poor wound healing, and osteomyelitis that doesn't respond to standard treatment (chronic bone inflammation). There is conflicting evidence about whether HBOT is helpful in treating burns and fast-spreading infections of the skin and underlying tissues.

The lack of randomized clinical studies makes it hard to judge the value of HBOT for many of its claims. Available scientific evidence does not support claims that HBOT stops the growth of cancer cells, destroys germs, improves allergy symptoms, or helps patients who have chronic fatigue syndrome, arthritis, multiple sclerosis, autism, stroke, cerebral palsy, senility, cirrhosis, or gastrointestinal ulcers.

Carefully controlled scientific studies are going on to find out whether HBOT may be helpful for lymphedema (swelling in arms or legs after surgery, which can happen after mastectomy), diabetic ulcers, cluster headaches, heart attacks, and other conditions.

**Are there any possible problems or complications?**

HBOT is a relatively safe method for approved medical treatments. Complications can be reduced if pressures within the hyperbaric chamber remain below 3 times normal atmospheric pressure and sessions last no longer than two hours.

Milder problems associated with HBOT include claustrophobia (in monoplace chambers), fatigue, and headache. More serious complications include myopia (short sightedness) that can last for weeks or months, sinus damage, ruptured middle ear, and lung damage. A complication called oxygen toxicity can result in seizures, fluid in the lungs, and even respiratory failure. Patients at high risk of oxygen toxicity may be given “air breaks” during which they breathe room air rather than oxygen for short periods during treatment. People with severe congestive heart failure may have their symptoms worsened by HBOT. Patients with certain types of lung disease may be at higher risk of collapsed lung during HBOT. Pregnant women should be treated with HBOT only in serious situations where there are no other options. Hyperbaric oxygen chambers can also be a fire hazard: fires or explosions in hyperbaric chambers have caused about 80 deaths worldwide.

**References**


Tibbles PM, Edelsberg JS. Review Articles: Medical progress: Hyperbaric-Oxygen Therapy. *N Engl J*


Note: This information may not cover all possible claims, uses, actions, precautions, side effects or interactions. It is not intended as medical advice, and should not be relied upon as a substitute for consultation with your doctor, who is familiar with your medical situation.