

# Hyperbaric Oxygen Therapy for Diabetes-Related Foot Wounds

## What is hyperbaric oxygen?

Hyperbaric oxygen therapy (HBO<sub>2</sub>) is a medical treatment in which a patient breathes 100% oxygen while inside a high-pressure air chamber.

HBO<sub>2</sub> has been used for more than 40 years to help people recover from illnesses such as carbon monoxide poisoning. Today it is also used to treat problem wounds.

Studies have shown that HBO<sub>2</sub> can play an important role in the treatment of wounds such as foot ulcers, which sometimes occur in persons with diabetes. Oxygen applied directly to body surface areas is not HBO<sub>2</sub> therapy and is not considered useful treatment.

## How does HBO<sub>2</sub> work?

The body needs oxygen to heal itself. White blood cells need oxygen to fight infections. Tissues need oxygen to repair themselves and make new blood vessels. Without enough oxygen, wounds do not heal.

The air we breathe contains 21% pure oxygen. Breathing 100% pure oxygen through a facemask increases oxygen in the bloodstream. Breathing 100% oxygen while in a pressurized chamber gives patients 10-15 times more oxygen than using just the facemask. That extra oxygen in the bloodstream is what aids the healing process.

## How does HBO<sub>2</sub> therapy help diabetic feet?

People with diabetes can develop foot ulcers because of poor circulation and nerve damage in the feet. A person with loss of feeling in his or her feet may step on a sharp object or wear ill-fitting shoes and not feel any pain. The resulting cuts and sores may go unnoticed and become infected.

Some people with diabetes cannot get enough oxygen to foot ulcers because blood vessels in their legs and feet have hardened due to poor circulation. Blood moves more slowly through these hardened vessels, depriving the wound of oxygen.

HBO<sub>2</sub> therapy does not always cure diabetic foot ulcers, nor is it the first treatment that should be tried. Foot wounds often require surgery or other treatments. HBO<sub>2</sub> does not work well if these other problems are not solved first.

Increasing blood flow to the wound is important, and staying off of an open foot wound can also help healing. HBO<sub>2</sub> therapy can help deliver extra oxygen to foot ulcers when other treatments alone are not enough.

## What are the chambers like? What does it feel like in there?

In a mono-place chamber, the patient lies on a stretcher that slides into a large tube. This tube is then pressurized with 100% oxygen.

HBO<sub>2</sub> therapy is painless. In a mono-place chamber, the patient lies down comfortably and may listen to music, watch television, or

even take a nap during the therapy session. They may feel fullness in their ears as they adjust to changes in air pressure at the start of the session. This is similar to what a patient feels in an airplane when landing.

## What if the patient has low blood glucose while in the chamber?

Patients with diabetes have their blood glucose levels checked before entering the HBO<sub>2</sub> chamber. Then, they can have a snack, if needed, to prevent low blood glucose.

If the patient feels symptoms of low blood glucose or need any other kind of help, they can communicate with the attendants.

HBO<sub>2</sub> therapy chambers are monitored from the outside by people using advanced controls and computer systems. Mono-place chambers have two-way intercom systems so that patients can speak with attendants outside the chamber.



## Do patients have to do anything special to prepare for HBO<sub>2</sub> Therapy?

There are several things to consider before starting HBO<sub>2</sub> therapy:

- **Smoking:** Nicotine makes blood vessels narrow. This limits the flow of blood and oxygen. Therefore, you should not use tobacco until all your HBO<sub>2</sub> treatments are completed.
- **Medications:** Some medicines change the way your body handles oxygen. It is important for patients to tell their health care team about all their medications, including any nonprescription drugs.
- **Report Illnesses:** Cold or flu symptoms such as fever, cough, sore throat, nausea, headache or body aches may cause a delay in your treatment. These symptoms should be reported to your team as soon as possible.
- **Clothing:** Patients will be given special clothes to wear during therapy.
- **Wound Dressings:** There is no added benefit from oxygen coming into contact with the skin. Therefore, wound dressings are left on during treatments.
- **Personal Items:** Most personal belongings aren't allowed in the HBO<sub>2</sub> chamber. Don't bring in:
  - Tobacco products, matches or lighters
  - Jewelry or other metal objects

- Electronic items, such as stereos or games
- Hair spray, make up, perfumes, deodorants or lotions
- Dentures or partial plates
- Contact lenses
- **Claustrophobia:** If the fear of closed-in places is a problem, physicians may prescribe patients medication to relax them.

## How long will I get this therapy?

Most wounds require 30-40 HBO<sub>2</sub> treatments. The treatments are usually given daily, 5-6 days per week, for 90 minutes. As the health care team, you will decide how many treatments your patients need.

## Are there any side effects?

Some patients report crackling or popping in their ears between visits. This can be eased by using the same tips shown for dealing with ear problems while in the chamber. Patients may have to have tubes put in their ears to relieve ear pain.

Rarely, patients having HBO<sub>2</sub> therapy have temporary changes in eyesight. If this happens, vision will return to normal within 6-8 weeks.

## Additional Resources:

The following resources from the American Diabetes Association provide more information about diabetes and its complications:

*American Diabetes Association Complete Guide to Diabetes* (\$25.95 for Association members; \$29.95 for nonmembers).

*101 Tips for Staying Healthy With Diabetes* (\$9.95 for members; \$12.95 for nonmembers).

*Diabetes A to Z* (\$7.95 for nonmembers; \$9.95 for nonmembers).

To order these books, call 1-800-ADA-ORDER.

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