

# **Hyperbaric Oxygen Therapy (HBOT)**



Doctor House Cardio Vascular Center

## **Introduction:**

**Hyperbaric Medicine** is the fascinating use of barometric pressure for delivering increased oxygen dissolved in plasma to body tissues.

**Hyperbaric Oxygen Therapy (HBOT)** is a form of treatment in which a patient breathes 100% oxygen at higher than normal atmospheric pressure in a special therapeutic chamber. Over the last two decades, validated clinical experience has proved efficacy of HBOT in many indications. In certain conditions such as Gas Gangrene and crush injuries, the addition of Hyperbaric oxygen may be life and limb saving. Treating Gangrene and preventing amputation, especially in diabetic patients, is one of the most important indications for HBOT.

## **Method of Delivery:**

The Hyperbaric Oxygen treatment modules are metallic chambers in which the pressure of air is increased pneumatically, usually between 1 to 3 atmospheres. The patient lies in the chamber for about 60 to 90 minutes breathing pure oxygen. Since the oxygen is under increased atmospheric pressure, there is increased diffusion of this oxygen into the plasma, resulting ultimately in increased and sustained delivery of increased oxygen to the hypoxic oxygen deprived tissues. This leads to accelerated healing of many types of Problem Wounds. Depending on the type and severity of the wound, between 10 to 20 such sittings are required. This may be done once a day, or on occasions even twice a day.

## **Indications for Hyperbaric Therapy:**

Patients with the following conditions may benefit from HBOT:

- 1) Diabetic Wounds of the Lower extremity.
- 2) Acute Peripheral Ischemia.
- 3) Acute Carbon Monoxide Intoxication.
- 4) Decompression Illness.
- 5) Air Embolism.
- 6) Gas Gangrene.
- 7) Cyanide Poisoning.
- 8) Crush Injuries.
- 9) Necrotizing Fasciitis.
- 10) Preservation or Compromise of Skin Grafts or Flaps.
- 11) Chronic Refractory Osteomyelitis.
- 12) Soft Tissue Radionecrosis.
- 13) Osteoradionecrosis.
- 14) There are a number of other additional indications for which HBOT has been shown to be beneficial.

## **Side Effects:**

When used in standard protocols, hyperbaric oxygen therapy is safe. The commonest side effect may be slight pain in the ears (aural barotrauma) due to a blocked Eustachian tube. Pneumothorax and air embolism and transient reversible myopia after prolonged HBO therapy are rare complications. An occasional patient may be claustrophobic. Fire is a realistic hazard but preventable by strict safety procedures.




**Contra Indications:**

Anyone with any of the following conditions may not be a suitable candidate for HBOT:

- 1) Asthma.
- 2) Congenital spherocytosis.
- 3) Cisplatinum.
- 4) Disulphiram (Antabuse).
- 5) Doxorubicin (Adriamycin).
- 6) Emphysema with CO2 retention.
- 7) High Fevers.
- 8) History of middle ear surgery or disorders.
- 9) History of seizures.
- 10) Optic Neuritis.
- 11) Pneumothorax.
- 12) Pregnancy.
- 13) Upper Respiratory Tract Infections.
- 14) Viral Infections.

**Clinical Trials and Research Areas:**

A number of areas are being explored to determine if Hyperbaric Oxygen might be of clinical benefit. Senility, Stroke, Sports injuries, High Altitude sickness, Brain Injury, Migraine, Fulminant Hepatic failure, Sickle cell crisis, Spinal cord injury, Purpura Fulminans, Actinomcosis, Mesenteric Thrombosis, Central Retinal artery thrombosis and Cerebral spasticity are some of the areas being aggressively pursued.

	<p><b>Diabetic Foot :</b> Seen due to a combination of vascular ischemia and infection. May lead to Gangrene. HBOT is an useful adjunct along with antibiotics to treat this condition.</p>
	<p><b>Gangrene:</b> Due to marked decrease or absence of arterial blood supply to the limb. HBOT can help to stop further progression of gangrene and limit the level of amputation of the limb.</p>
	<p><b>Venous Gangrene:</b> Due to blockage of the venous supply of the leg. HBOT is effective ancillary treatment to save the limb.</p>

**Results of Hyperbaric Oxygen Treatment:**

**Case 1 : Arterial Ulcer with Failure of Plastic Surgery Graft, Treated with HBOT**



**Before**



**After**

**Case 2 : Non Healing of Amputation Stump**



**Before**



**After**

**Case 3 : Cancer with Radiation Necrosis**



**Before**



**After**

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