Subject: Hyperbaric Oxygen Therapy (HBO)

Overview: HBO is used to treat a variety of conditions including carbon monoxide poisoning, tissue injuring due to thermal burns, radiation exposure, trauma, surgery or infection. During the therapy patients breathe pure oxygen at a pressure typically 2 to 3 times greater than the atmospheric pressure. It is intended to either accelerate or cause healing that would not ordinarily occur.

Policy and Coverage Criteria:

NOTE: Prior Authorization is NOT required

Harvard Pilgrim covers HBO therapy for the following indications:

- Acute carbon monoxide intoxication
- Decompression illness
- Gas embolism
- Gas gangrene
- Acute traumatic peripheral ischemia
- Crush injuries & suturing of severed limbs
- Progressive necrotizing infections
- Acute peripheral arterial insufficiency
- Preparation and preservation of compromised skin grafts
- Chronic refractory osteomyelitis
- Osteoradionecrosis as adjunct to conventional treatment
- Soft tissue radionecrosis as an adjunct to conventional treatment
- Cyanide poisoning
- Actinomycosis as adjunct to conventional therapy
- Chronic non-healing infected, deep ulcerations of lower extremities in diabetic adults
- Skin burns (thermal)

Exclusions: Harvard Pilgrim does NOT cover HBO therapy for conditions other than those listed above, including: exceptional blood loss anemia (only with overwhelming blood loss and transfusion not an option), acute cerebral edema, intracranial abscess, Crohn’s disease, brown recluse spider bites, and topical hyperbaric oxygen therapy.

Supporting Information:

1. Technology Assessment: During HBO therapy, patients breathe pure oxygen gas at high pressure, usually 2 to 3 times greater than atmospheric pressure. The elevated concentration and pressure of the oxygen result in higher levels of oxygen absorption by blood plasma and by non-poisoned hemoglobin, elevating oxygen delivery to the tissues. Multi-place chambers allow closer monitoring of critically ill patients, while single occupancy chambers are most appropriate for the treatment of chronic medical conditions in stable patients. Chamber pressure is usually maintained between 2.5 and 3.0 atm, with treatment lasting 45 to 300 minutes depending upon the indication. Acute therapy may require only one or two treatments, while chronic medical conditions may warrant up to 30 or more sessions. Typically, hyperbaric therapy is administered with pressurized oxygen or air. Pressures exceeding 2.8 to 3.0 atm, particularly over prolonged exposure hyperbaric periods, dramatically
increase the risk of both neurologic and pulmonary oxygen toxicity. Helium/oxygen (heliox) or nitrogen/oxygen (nitrox) mixtures are indicated only in certain instances of decompression illness. The only absolute contraindication to HBO therapy is untreated pneumothorax. Relative contraindications include obstructive lung disease, upper respiratory or sinus infections, recent ear surgery or injury, fever, and claustrophobia. Pregnancy was once believed to represent a contraindication to HBO, but now is considered an impetus to pursue HBO therapy among patients with CO intoxication. Patients with a history of a seizure disorder, pneumothorax, or chest surgery are at highest risk for complications related to barotrauma or central nervous system oxygen toxicity.

2. Literature Review:

The safety and efficacy of HBO therapy has been validated in peer-reviewed literature for a number of selected conditions.

HBO is considered standard of care in the primary treatment of acute carbon monoxide poisoning, air or gas embolism, and decompression sickness. It has also been shown to be effective as an adjunctive therapy in the treatment of acute cyanide poisoning, gas gangrene, crush injuries and suturing of severed limbs, compromised skin grafts, acute thermal burns, progressive necrotizing infections, chronic refractory osteomyelitis, osteoradionecrosis and soft tissue radionecrosis, as well as treatment of chronic, non-healing, lower extremity diabetic wounds.

Appropriate indications have been reviewed and assessed by groups such as the Agency for Healthcare Research and Quality, Undersea and Hyperbaric Medical Society, American College of Hyperbaric Medicine, and the Alberta Heritage Foundation for Medical Research. Collective literature notes that HBO therapy should not be a replacement for other standard successful therapies.

3. Professional/Governmental Agencies:

Undersea and Hyperbaric Medical Society: Indications approved for use of hyperbaric oxygen therapy as defined by the Hyperbaric Oxygen Therapy Committee:

- Air or Gas Embolism
- Carbon Monoxide Poisoning
  - Carbon Monoxide Poisoning Complicated By Cyanide Poisoning
- Clostridial Myositis and Myonecrosis (Gas Gangrene)
- Crush Injury, Compartment Syndrome and Other Acute Traumatic Ischemias
- Decompression Sickness
- Arterial Insufficiencies:
  - Central Retinal Artery Occlusion
  - Enhancement of Healing In Selected Problem Wounds
- Severe Anemia
- Intracranial Abscess
- Necrotizing Soft Tissue Infections
- Osteomyelitis (Refractory)
- Delayed Radiation Injury (Soft Tissue and Bony Necrosis)
- Compromised Grafts and Flaps
- Acute Thermal Burn Injury
- Idiopathic Sudden Sensorineural Hearing Loss (New! approved on October 8, 2011 by the UHMS Board of Directors)

[http://membership.uhms.org/?page=Indications](http://membership.uhms.org/?page=Indications)

American College of Hyperbaric Medicine:
The following indications are approved by the American College of Hyperbaric Medicine and are reimbursable through CMS:

- Air or Gas Embolism
- Carbon Monoxide Intoxication
• Clostridial Myonecrosis (Gas Gangrene)
• Compromised Skin Grafts / Tissue Flaps
• Crush Injuries
• Compartment Syndrome and Acute Traumatic Ischemias
• Decompression Illness
• Enhancement of healing in select problem wounds
• Extreme anemia
• Intracranial abscess
• Necrotizing Soft Tissue Infections
• Osteomyelitis (refractory)
• Delayed radiation injury (soft tissue and bony necrosis)
• http://www.achm.org/faq-items/what-are-the-approved-indications-for-hyperbaric-oxygen-therapy/

FDA: Hyperbaric oxygen (HBO) chambers are regulated by the FDA as Class II medical devices, and 45 different chambers have met all requirements of the 510(k) approval process. Devices that are not implantable and pose no risk of fatal outcome to the consumer should they malfunction are assigned Class II status and must meet FDA performance standards.

CMS: Program reimbursement for HBO therapy will be limited to that which is administered in a chamber (including the one man unit) and is limited to the following conditions:

• Acute carbon monoxide intoxication,
• Decompression illness,
• Gas embolism,
• Gas gangrene,
• Acute traumatic peripheral ischemia. HBO therapy is a valuable adjunctive treatment to be used in combination with accepted standard therapeutic measures when loss of function, limb, or life is threatened.
• Crush injuries and suturing of severed limbs. As in the previous conditions, HBO therapy would be an adjunctive treatment when loss of function, limb, or life is threatened.
• Progressive necrotizing infections (necrotizing fasciitis),
• Acute peripheral arterial insufficiency,
• Preparation and preservation of compromised skin grafts (not for primary management of wounds),
• Chronic refractory osteomyelitis, unresponsive to conventional medical and surgical management,
• Osteoradionecrosis as an adjunct to conventional treatment,
• Soft tissue radionecrosis as an adjunct to conventional treatment,
• Cyanide poisoning,
• Actinomycosis, only as an adjunct to conventional therapy when the disease process is refractory to antibiotics and surgical treatment,
• Diabetic wounds of the lower extremities in patients who meet the following three criteria:
  • Patient has type I or type II diabetes and has a lower extremity wound that is due to diabetes;
  • Patient has a wound classified as Wagner grade III or higher; and
  • Patient has failed an adequate course of standard wound therapy.

The use of HBO therapy is covered as adjunctive therapy only after there are no measurable signs of healing for at least 30 days of treatment with standard wound therapy and must be used in addition to standard wound care. Standard wound care in patients with diabetic wounds includes: assessment of a patient’s vascular status and correction of any vascular problems in the affected limb if possible, optimization of nutritional status, optimization of glucose control, debridement by any means to remove devitalized tissue, maintenance of a clean, moist bed of granulation tissue with appropriate moist dressings, appropriate off-loading, and necessary treatment to resolve any infection that might be present. Failure to respond to standard wound care occurs when there are no measurable signs of healing for at least 30 consecutive days. Wounds must be evaluated at least every 30 days during administration of HBO therapy. Continued treatment
with HBO therapy is not covered if measurable signs of healing have not been demonstrated within any 30-day period of treatment.

No program payment may be made for HBO in the treatment of the following conditions:
- Cutaneous, decubitus, and stasis ulcers.
- Chronic peripheral vascular insufficiency.
- Anaerobic septicemia and infection other than clostridial.
- Skin burns (thermal).
- Senility.
- Myocardial infarction.
- Cardiogenic shock.
- Sickle cell anemia.
- Acute thermal and chemical pulmonary damage, i.e., smoke inhalation with pulmonary insufficiency.
- Acute or chronic cerebral vascular insufficiency.
- Hepatic necrosis.
- Aerobic septicemia.
- Tetanus.
- Systemic aerobic infection.
- Organ transplantation.
- Organ storage.
- Pulmonary emphysema.
- Exceptional blood loss anemia.
- Multiple Sclerosis.
- Arthritic Diseases.
- Acute cerebral edema.

No Medicare reimbursement may be made for the topical application of oxygen.


**Codes:**

CPT:
- 99183 – Physician attendance and supervision of hyperbaric oxygen therapy, per session
- G0277 – Hyperbaric oxygen under pressure, full body chamber, per 30 minute interval
- C1300 – Hyperbaric oxygen under pressure, full body chamber, per 30 minute

Medically necessary ICD-10 codes

**References:**


Summary of Changes

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<th>Date</th>
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<tbody>
<tr>
<td>4/17</td>
<td>Removed Benchmarks and ICD 9 references</td>
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