

Hyperbaric Oxygen Therapy/Topical Oxygen Therapy

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Developed By: Medical Necessity Criteria Committee

I. Description

Hyperbaric oxygen therapy (HBOT) is a systemic medical treatment in which high pressures of oxygen are delivered to tissues. The patient is entirely enclosed in a pressurized chamber and breathes oxygen at a pressure greater than one atmosphere (the pressure of oxygen at sea level). Alveolar oxygen pressure is increased, causing a rise in plasma oxygen content which results in enhanced tissue oxygen delivery. Treatment may be carried out either in a monoplace (one person) chamber pressurized with oxygen or in a larger multiperson (two or more person) chamber pressurized with compressed air, in which case the patient receives pure oxygen by mask, head tent, or endotracheal tube.

Topical oxygen therapy, also called topical hyperbaric oxygen therapy, involves the direct application of 100% oxygen to an open wound base. The oxygen is delivered at a pressure just above atmospheric pressure. Topical oxygen therapy is administered through special chambers that fit around a limb or by using disposable polyethylene bags. Conventional oxygen tanks may be used as the oxygen source. Topical oxygen therapy can be performed in an office or clinic or in the home by well-trained patients. The efficacy of topical HBOT has not been proven due to the lack of controlled clinical trials.

II. Criteria: CWQI HCS-0036

- A. OHSU Health Services will cover systemic hyperbaric oxygen therapy when all standard therapies have failed for up to 30 days of treatment and/or 30 treatments total for including but not limited to 1 or more of the following:
- a. Non-healing diabetic wounds of the lower extremities in patients who meet **All** of the following 3 criteria:
 - i. Patient has type I or type II diabetes and has a lower extremity wound that is due to diabetes;
 - ii. Patient has a wound classified as Wagner grade 3 or higher;
 - iii. Patient has no measurable signs of healing after 30 days of an adequate course of standard wound therapy
 - b. Acute air or gas embolism
 - c. Decompression illness ("the bends")
 - d. Acute carbon monoxide poisoning
 - e. Acute peripheral arterial insufficiency (i.e. compartment syndrome) requiring emergent surgical intervention
 - f. Acute traumatic peripheral ischemia (including crush injuries and suturing of severed limbs)

- g. Cyanide poisoning
- h. Gas gangrene
- i. Compromised skin grafts and flaps
- j. Chronic refractory osteomyelitis, unresponsive to conventional medical and surgical management
- k. Idiopathic sudden deafness, acoustic trauma or noise-induced hearing loss when HBOT is initiated within three months after onset.
- l. Radiation necrosis (osteoradionecrosis, myoradionecrosis, brain radionecrosis, and other soft tissue radiation necrosis) as an adjunct to conventional treatment
- m. Prophylactic pre- and post-treatment for members undergoing dental surgery of a radiated jaw
- n. Acute cerebral edema (not covered for Medicare)
- o. Intracranial Abscess (not covered for Medicare)
- p. Exceptional blood loss anemia when there is overwhelming blood loss and transfusion is not possible due to no suitable blood available or religion does not permit transfusions (not covered for Medicare).
- q. Burns of the hands, face or groin area, or deep second-degree and third degree burns that cover 20% or more of the patient's body
- r. Necrotizing soft tissue infections, including refractory mycoses such as mucormycosis, *Conidiobolus coronato* and actinomycosis, severe enough to require multiple surgical procedures
- s. Actinomycosis as adjunct to conventional therapy
- t. Central retinal artery occlusion
- u. Radiation cystitis that is resistant or has failed conservative intervention
- v. Other indications not listed with further investigation determined appropriate.

B. Systemic hyperbaric oxygen therapy is considered investigational and NOT covered including but not limited to **All** of the following indications:

- a. Brown recluse spider bites
- b. Cutaneous, decubitus, and stasis ulcers
- c. Chronic peripheral vascular insufficiency
- d. Crohn's Disease
- e. Anaerobic septicemia
- f. Skin burns (thermal)
- g. Senility
- h. Myocardial infarction
- i. Cardiogenic shock
- j. Sickle cell anemia
- k. Acute thermal and chemical pulmonary damage, (i.e. smoke inhalation with pulmonary insufficiency)
- l. Acute or chronic cerebral vascular insufficiency
- m. Hepatic necrosis
- n. Aerobic septicemia
- o. Nonvascular causes of chronic brain syndrome (Pick's disease, Alzheimer disease, Korsakoff's disease)
- p. Tetanus
- q. Systemic aerobic infection
- r. Organ transplantation
- s. Pulmonary emphysema
- t. Exceptional blood loss anemia
- u. Multiple sclerosis

- v. Arthritic diseases
- w. Acute cerebral edema
- x. Autism Spectrum Disorders

C. OHSU Health Services considers systemic hyperbaric oxygen therapy experimental and investigational for patients with **All** of the following contraindications to HBO. The safety and effectiveness of HBO for persons with these contraindications have not been established:

- a. Request is **NOT** for untreated pneumothorax
- b. Hyperbaric oxygen is **NOT** being used concurrent with the administration of doxorubicin, cisplatin, bleomycin or disulfiram
- c. Use of hyperbaric oxygen is **NOT** for premature infants (birth prior to 37 weeks gestation)
- d. The request is **NOT** for topical oxygen therapy, including topical HBO administered to an open wound in a small limb-encasing device, as this is considered experimental and investigational because its efficacy has not been established through controlled clinical trials.

D. Limitations:

After initial authorization of up to 30 days of treatment and/or 30 treatments total, OHSU Health Services will request a progress report prior to authorization of additional HBO treatment. Wounds must be evaluated at least every 30 days during administration of HBOT. Continued treatment with HBO therapy is not covered if measurable signs of healing have not been demonstrated within any 30 day period of treatment.

III. Information Submitted with the Prior Authorization Request:

- 1. Chart notes from ordering specialist including history and physical
- 2. Treatment history
- 3. Treatment plan including number of HBO sessions anticipated
- 4. Progress report for continued treatment with HBO

IV. CPT or HCPC codes covered:

Codes	Description
G0277	Hyperbaric oxygen under pressure, full body chamber, per 30 minute interval
99183	Physician attendance and supervision of hyperbaric oxygen therapy, per session

V. CPT or HCPC codes NOT covered:

Codes	Description
A4575	Topical hyperbaric oxygen chamber, disposable
E0446	Topical oxygen delivery system, not otherwise specified, includes all supplies and accessories

VI. Annual Review History

Review Date	Revisions	Effective Date
01/2013	Annual Review: Added table with review date, revisions, and effective date. Dr. Engrav's signature added instead of Dr. Mills.	01/23/2013
12/2013	Annual Review: No changes	12/19/2013
03/14	Removed the recommended number of treatments from each indication and added review after 30 days or 30 treatments total.	04/03/14
04/2015	Annual Review: No changes	04/01/2015
06/2015	Added ICD-9 codes and Medicare Guidelines	06/24/2015
01/2016	Deleted ICD-9 codes, Added ICD-10 codes	01/25/2016
05/2017	Annual Review: Updated to new template, added not covered indications.	05/24/2016
05/2018	Annual Review:	05/23/2018
05/2019	Annual Review: No changes	06/01/2019
05/2020	Annual Review: No content changes	06/01/2020

VII. References

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14. Weaver L, Hopkins R, Chan K, et al. Hyperbaric oxygen for acute carbon monoxide poisoning. *The New England Journal of Medicine*. October 2002; 347(14):1057-1067.
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16. Physician Advisors

Appendix 1 – Covered Diagnosis Codes

ICD 10 code	ICD 10 Code Description
A42.0-A42.9	Actinomycosis
A48.0	Gas gangrene
D50.0	Iron deficiency anemia secondary to blood loss (chronic) [overwhelming and transfusion is impossible because there is no suitable blood available or religion does not permit]
D62	Acute post hemorrhagic anemia
E10.621-E10.622	Type I diabetes mellitus with skin ulcer
E11.621-E11.622	Type 2 diabetes mellitus with skin ulcer
G93.6	Cerebral edema
H83.3x1- H83.3x9	Noise effects on inner ear [noise-induced hearing loss when HBOT is initiated within 3 months after onset]
H91.20 - H91.23	Sudden idiopathic hearing loss [idiopathic when HBOT is initiated within 3 months after onset]
I70.201- I70.92	Atherosclerosis of native arteries and bypass graft(s) of the extremities
I72.1 - I72.4	Other aneurysm of extremities

I73.00 - I73.1	Other peripheral vascular disease
I74.2 - I74.3	Arterial embolism of the extremities [acute peripheral arterial insufficiency]
I74.5	Arterial embolism and thrombosis of the iliac artery [acute peripheral arterial insufficiency]
I87.2	Venous insufficiency (chronic) (peripheral
L97.101- L97.929	Non-pressure chronic ulcer of lower limb, not elsewhere classified
M27.2	Inflammatory conditions of the jaws
M27.8	Other specified diseases of jaw
M72.6	Necrotizing fasciitis
M86.30- M86.39	Chronic multifocal osteomyelitis
M86.40- M86.49	Chronic osteomyelitis with draining sinus
M86.50- M86.59	Other chronic hematogenous osteomyelitis
M86.60- M86.69	Other chronic osteomyelitis
M86.8X1- M86.8X9	Other osteomyelitis
M87.08	Idiopathic aseptic necrosis of bone, other site [jaw]
R65.10	Systemic inflammatory response syndrome (SIRS) of non-infectious origin without acute organ dysfunction
S07.0XXS-S07.9XXS	Crushing injuries of head
S35.511A-S35.516S	Injury to the iliac artery or vein
S38.1XXA-S38.1XXS	Crushing injury of abdomen, lower back, and pelvis
S45.001A-S45.009S	Injury to axillary artery
S45.101A-S45.109S	Injury to brachial artery
S47.1XXA-S47.9XXS	Crushing injury of shoulder and upper arm
S75.001A -S75.009S	Injury of femoral artery
S77.00XA-S77.22XS	Crushing injury of hip and thigh
S85.001A -S85.009S	Injury to popliteal artery

T57.3X1A-T57.3X4S	Toxic effect of hydrogen cyanide [with co-existing carbon monoxide poisoning]
T58.01XA-T58.04XS	Toxic effect of carbon monoxide from unspecified source, undetermined, initial encounter
T65.0X1A-T65.0X4S	Toxic effect of cyanides [with co-existing carbon monoxide poisoning]
T66.XXXA-T66.XXXS	Radiation sickness, unspecified, sequela
T70.0XXA-T70.9XXS	Effects of air pressure and water pressure
T79.0XXA-T79.9XXS	Air embolism (traumatic) [acute]
T79.A0XA-T79.A9XS	Compartment syndrome, unspecified, sequela
T80.0XXA-T80.0XXS	Air embolism following infusion, transfusion and therapeutic injection
T81.30XA-T81.33XS	Disruption of wound, unspecified, initial encounter
T84.7XXA- T84.7XXS	Infection and inflammatory reaction due to other internal orthopedic prosthetic devices, implants and grafts, initial encounter
T85.81XA T85.89XS	Other specified complications of internal prosthetic devices, implants and grafts, not elsewhere classified [compromised skin grafts and flaps]
T86.820 - T86.829	Complications of skin graft (allograft) (autograft) [compromised skin grafts and flaps]
T87.0X1-T87.0X9	Complications of reattached (part of) upper extremity
T87.1X1-T87.1X9	Complications of reattached (part of) lower extremity
T87.2	Complications of other reattached body part

Appendix 2 – Centers for Medicare and Medicaid Services (CMS)

Medicare coverage for outpatient (Part B) drugs is outlined in the Medicare Benefit Policy Manual (Pub. 100-2), Chapter 15, §50 Drugs and Biologicals. In addition, National Coverage Determination (NCD) and Local Coverage Determinations (LCDs) may exist and compliance with these policies is required where applicable. They can be found at: <http://www.cms.gov/medicare-coverage-database/search/advanced-search.aspx>. Additional indications may be covered at the discretion of the health plan.

Medicare Part B Covered Diagnosis Codes (applicable to existing NCD/LCD):

Jurisdiction(s): 5, 8	NCD/LCD Document (s):
National Coverage Determination (NCD) 20.29 Hyperbaric Oxygen Therapy	

NCD/LCD Document (s):

Medicare Part B Administrative Contractor (MAC) Jurisdictions

Jurisdiction	Applicable State/US Territory	Contractor
F (2 & 3)	AK, WA, OR, ID, ND, SD, MT, WY, UT, AZ	Noridian Healthcare Solutions, LLC