Priority Health

MEDICAL POLICY
No. 91151-R9

HYPERBARIC OXYGEN THERAPY

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Date of Origin: June 30, 1988

Status: Current

Summary of Changes

- Addition:
  - Home HBOT chambers are experimental and investigational.
  - New sections: Government/Regulations, and Guidelines/Position Statements.

I. POLICY/CRITERIA

A. Non-wound related therapy

1. Hyperbaric Oxygen Therapy (HBOT) is medically necessary for the following indications. It should not be a replacement for other standard successful therapeutic measures.
   a. Actinomycosis, only as an adjunct to conventional therapy when the disease process is refractory to antibiotics and surgical treatment
   b. Acute carbon monoxide intoxication
   c. Acute peripheral artery insufficiency
   d. Central Retinal Artery Occlusion
   e. Chronic refractory osteomyelitis, unresponsive to conventional medical and surgical management
   f. Cyanide poisoning
   g. Decompression illness
   h. Gas embolism
   i. Idiopathic sudden sensorineural hearing loss (ISSHL)
   j. Osteoradionecrosis as an adjunct to conventional treatment
   k. Soft tissue radionecrosis as an adjunct to conventional treatment

B. Wound Therapy

1. Initial therapy: The use of systemic HBOT is medically necessary for the following indications:

   a. Preparation and preservation of compromised skin grafts (not for primary management of wounds)
      i. Acute traumatic peripheral ischemia
      ii. Crush injuries and suturing of severed limbs
      iii. Gas gangrene
      iv. Progressive necrotizing infections (necrotizing fasciitis)

2. Adjunctive therapy: For the following indications HBOT is only medically necessary after there are no measurable signs of healing for at least 30-days of treatment with standard wound therapy and must be used with standard wound therapy.
   a. Diabetic wounds of the lower extremities in patients who meet the following three criteria:
      i. Patient has type 1 or type 2 diabetes and has a lower extremity wound due to diabetes;
      ii. Patient has a wound classified as Wagner grade III or higher; ***and***
      iii. Patient has failed an adequate course of standard wound therapy

C. Topical Hyperbaric Oxygen Therapy is considered experimental and investigational. There is lack of evidence to demonstrate that topical hyperbaric oxygen therapy accelerates wound healing, whether alone or as an adjunct to standard wound care.
D. Home HBOT chambers are experimental and investigational.

II. GOVERNMENT REGULATIONS

CMS Coverage Determinations	Title and Number
National Coverage Determinations (NCDs)	Hyperbaric Oxygen Therapy (20.29)
Local Coverage Determinations	N/A

III. GUIDELINES/POSITION STATEMENTS

Medical or Professional Society	Recommendation
American Academy of Ophthalmology	Retinal and Ophthalmic Artery Occlusions Preferred Practice Pattern (2020): "Initial treatment of an acute CRAO may include digital massage, anterior chamber paracente vasodilation, breathing into a paper bag, carbogen therapy, topical pressure-lowering therapies, or hyperbaric chambers."
Undersea and Hyperbaric Medical Society	Indications for Hyperbaric Oxygen Therapy, 14th edition

IV. MEDICAL NECESSITY REVIEW

Prior authorization for certain drug, services, and procedures may be required. In these cases, providers will submit a prior authorization request demonstrating that the drug, service, or procedure is medically necessary. For more information, please refer to the Priority Health Provider Manual.

V. APPLICATION TO PRODUCTS

Coverage is subject to member's specific benefits. Group specific policy will supersede this policy when applicable.

- **HMO/EPO:** ***This policy applies to insured HMO/EPO plans.***
- **POS:** ***This policy applies to insured POS plans.***
- **PPO:** ***This policy applies to insured PPO plans. Consult individual plan documents as state mandated benefits may apply. If there is a conflict between this policy and a plan document, the provisions of the plan document will govern.***
- **ASO:** ***For self-funded plans, consult individual plan documents. If there is a conflict between this policy and a self-funded plan document, the provisions of the plan document will govern.***
- **INDIVIDUAL:** ***For individual policies, consult the individual insurance policy. If there is a conflict between this medical policy and the individual insurance policy document, the provisions of the individual insurance policy will govern.***
- **MEDICARE:** ***Coverage is determined by the Centers for Medicare and Medicaid Services (CMS) and/or the Evidence of Coverage (EOC); if a coverage determination has not been adopted by CMS, this policy applies.***
- **MEDICAID/HEALTHY MICHIGAN PLAN:** ***For Medicaid/Healthy Michigan Plan members, this policy will apply. Coverage is based on medical necessity criteria being met and the appropriate code(s) from the coding section of this policy being included on the Michigan Medicaid Fee Schedule located at: http://www.michigan.gov/mdch/0,1607,7-132-2945_42542_42543_42546_42551-159815--,00.html. If there is a discrepancy between this policy and the Michigan Medicaid Provider Manual located at: http://www.michigan.gov/mdch/0,1607,7-132-2945_5100-87572--,00.html, the Michigan Medicaid Provider Manual will govern. If there is a discrepancy or lack of guidance in the Michigan Medicaid Provider Manual, the Priority Health contract with Michigan Medicaid will govern. For Medical Supplies/DME/Prosthetics and Orthotics, please refer to the Michigan Medicaid Fee Schedule to verify coverage.***

IV. DESCRIPTION

Hyperbaric oxygen therapy is a technique for delivering higher pressures of oxygen to the tissues either systemically or topically. Scientifically supported hyperbaric treatments are usually delivered at pressures between 1.9 to 3.0 atmosphere absolute ATA. HBO_2 therapy is used for many medical conditions including decompression sickness, carbon monoxide poisoning, diabetic wounds, delayed radiation injury, necrotizing fasciitis, gas gangrene, refractory osteomyelitis, and several other conditions proven by peer-reviewed research Hyperbaric oxygen is a medical procedure requiring a physician's prescription and oversight. All patients must have their entire body placed within a hard sided hyperbaric chamber that meets the American Society of Mechanical Engineers and Pressure Vessels for Human Occupancy (ASME-PVHO-1) code and the National Fire Protection Agency (NFPA 99) code and standards for hyperbaric chambers, at a pressure of not less than 2.0 ATA (202.65 KPa) while breathing physician prescribed medical grade oxygen for an amount of time that is typically between 90-120 minutes per treatment. Medical grade oxygen (>99.0% oxygen purity) is the only acceptable gas that should be used for therapeutic delivery of hyperbaric oxygen (UHMS, 2019).

In systemic hyperbaric oxygen therapy, the patient is entirely enclosed in a pressure chamber and breathes oxygen at a pressure greater than one atmosphere. This technique relies on the systemic circulation to deliver highly oxygenated blood to the target site, typically a wound, but can also be used to treat systemic illness such as air or gas embolism, central retinal artery occlusion, carbon monoxide poisoning, and gas gangrene.

Hyperbaric oxygen therapy for the treatment of central retinal artery occlusion (CRAO) is established. Chiabo and colleagues (2023) conducted a prospective, single-arm, non-controlled study analyzing efficacy and safety of hyperbaric oxygen therapy monitored by fluorescein angiography in patients with retinal artery occlusion (RAO). The study included 31 patients enrolled between July 2016 and March 2022. All consecutive patients diagnosed with RAO within 7 days underwent visual acuity measurement, fluorescein angiography (FA), macular optical coherence tomography (OCT) and OCT-angiography. They received two daily HBOT sessions (2.5 atmosphere absolute, 90 min) until revascularisation assessed by FA. Complete ophthalmic follow-up was scheduled at day 14, day 21 and at 1 month. The main outcome measure was a best-corrected visual acuity (BCVA) improvement defined as a decrease ≥0.3 logMAR at 1 month. Retinal revascularisation was observed in 48.4% and 87.1% of patients at days 14 and 21, respectively. The mean BCVA on referral and at 1 month was 1.51 logMAR and 1.10 logMAR, respectively. Fifteen (48.4%) patients achieved the main outcome measure. Six (19.4%) patients experienced minor barotrauma that did not require HBOT discontinuation. The univariate analysis showed that antiplatelet-treated patients (p=0.044) and patients with a poor initial BCVA (p=0.008) were more likely to achieve a BCVA improvement. The authors concluded that in RAO patients monitored by FA until spontaneous revascularisation of the central retinal artery, HBOT was effective and safe.

In a retrospective study by Rozenberg and colleagues (2022), 121 patients were treated by HBOT and 23 patients received only standard of care (SOC). In the HBOT group, best-corrected visual acuity (BCVA) improved from 2.89 ± 0.98 logMAR at presentation to 2.15 ± 1.07 logMAR upon the end of HBOT ($P < 0.001$), while the SOC group had no significant improvement, from 3.04 ± 0.82 logMAR at presentation to 2.80 ± 1.50 logMAR ($P = 0.24$). With adjustment for age, gender, and the duration of symptoms, final BCVA in the HBOT group was significantly better compared to the control group ($P = 0.023$). Rates of patients achieving vision of 20/200 or better were similar between groups (17.4% vs. 19.8%, $P = 0.523$).

Hyperbaric oxygen therapy to maintain oxygenation of the retina pending reperfusion, has been used to preserve vision with mixed results in a small series of patients. Several case series suggest that hyperbaric oxygen may improve visual outcome in CRAO. However, its use is limited because it is labor intensive to deploy and has limited availability. Hyperbaric oxygen may provide benefit as a temporizing measure while definitive reperfusion is pursued, although it is not felt to promote reperfusion itself. It is associated with a low risk of systemic complications, and intracranial or systemic

hemorrhage rates are not increased. One case report describes a successful outcome after concurrent use of hyperbaric oxygen and tPA for CRAO (UptoDate, 2023).

Medical society guidelines confer support for HBOT for CRAO: American Academy of Ophthalmology - *Retinal and Ophthalmic Artery Occlusions Preferred Practice Pattern (2020):* "Initial treatment of an acute CRAO may include digital massage, anterior chamber paracentesis, vasodilation, breathing into a paper bag, carbogen therapy, topical pressure-lowering therapies, or hyperbaric chambers." American Heart Association - *Management of Central Retinal Artery Occlusion: A Scientific Statement From the American Heart Association (2021):* "Emerging treatments, including HBO and intra-arterial tPA at early time points, show promise but require further study." Undersea and Hyperbaric Medical Society – *Hyperbaric Medicine Indications Manual (15th edition, 2023)* – lists central retinal artery occlusion as an indication for HBOT.

Topical hyperbaric oxygen therapy is a technique of delivering 100% oxygen in a limb-encasing device directly to an open, moist wound at a pressure slightly higher than atmospheric pressure. It is hypothesized that the high concentrations of oxygen diffuse directly into the wound to increase local cellular oxygen tension to promote wound healing. There is lack of literature and evidence to support this hypothesis. No guidance currently recommends use of topical HBOT. Notably, the Undersea and Hyperbaric Medical Society (UHMS) cautions that while some topical oxygen delivery devices may be described as "hyperbaric," they should not be assumed to be equivalent to monoplace or multiplace chamber (systemic) HBOT (UHMS, 2018).

Hyperbaric treatment at minimally elevated chamber pressures (mild hyperbaric oxygen) is unproven. Mild hyperbaric oxygen therapy is currently considered to be exposures delivered at pressures lower than 1.5 ATA. In "mild hyperbaric chambers", gas mixes well less than 95% O2 and delivered through breathing devices such as masks that do not provide a tight seal and by the nature of their construction allow mixing of gases with the ambient chamber air, further reducing the oxygen concentration. These treatments are available outside the setting of medical facilities, including physicians' offices, wellness centers, and health spas. Generally, these treatments are not physician-prescribed or supervised (UHMS, 2019).

As of July 2021, the FDA has cleared hyperbaric chambers for select indications. The FDA advises that patients go to a hospital or facility that has been inspected and is properly accredited by the Undersea and Hyperbaric Medical Society.

VI. CODING INFORMATION

Revenue code:
0413 Hyperbaric Oxygen Therapy for Outpatient

CPT/HCPCS Codes:
99183 Physician or other qualified health care professional attendance and supervision of hyperbaric oxygen therapy, per session

G0277 Hyperbaric oxygen under pressure, full body chamber, per 30 minute interval

Not Covered:

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

ICD-10 Codes that are covered for these procedures when criteria are met:

- Acute carbon monoxide intoxication
  T58.01xA – T58.94xS Toxic effect of carbon monoxide
- Decompression illness
  T70.29XA T70.29XS Other effects of high altitude
  T70.3XXA – T70.3XXS Caisson disease [decompression sickness]
  T70.9XXA – T70.9XXS Effect of air pressure and water pressure, unspecified
- Gas embolism
  T79.0XXA – T79.0XXS Air embolism (traumatic)
  T80.0XXA – T80.0XXS Air embolism following infusion, transfusion and therapeutic injection
- Acute peripheral artery insufficiency
  I70.231 – I70.249 Atherosclerosis of native arteries of leg with ulceration
  I70.331 – I70.349 Atherosclerosis of unspecified type of bypass graft(s) of leg with ulceration
  I70.431 – I70.469 Atherosclerosis of autologous vein bypass graft(s) of leg with ulceration
  I70.531 – I70.549 Atherosclerosis of nonautologous biological bypass graft(s) of leg with ulceration
  I70.631 – I70.669 Atherosclerosis of nonbiological bypass graft(s) of leg with ulceration
  I70.731 – I70.769 Atherosclerosis of other type of bypass graft(s) of extremity with ulceration/gangrene
  I74.2 – I74.5 Embolism and thrombosis of arteries
  L97.101 – L97.929 Non-pressure chronic ulcer of lower limb

- Chronic refractory osteomyelitis
  M86.30 – M86.69 Chronic osteomyelitis
  M86.8X0 – M86.8X8 Other osteomyelitis

- Osteoradionecrosis
  Soft tissue radionecrosis as an adjunct to conventional treatment
  T66.XXXA - T66.XXXS Radiation sickness, unspecified
  M27.2 Inflammatory conditions of the jaw
  M27.8 Other specified diseases of jaws
  L59.8 Other specified disorders of the skin and subcutaneous tissue related to radiation
  L59.9 Disorder of the skin and subcutaneous tissue related to radiation, unspecified

- Cyanide poisoning
  T57.3X1A – T57.3X4S Toxic effect of hydrogen cyanide, undetermined

T65.0X1A – T65.0X4S	Toxic effect of cyanides, accidental (unintentional)

- Actinomycosis

A42.0 – A42.9	Actinomycosis
A43.0 – A43.9	Nocardiosis
B47.1	Actinomycetoma
B47.9	Mycetoma, unspecified
L08.1	Erythrasma

- Preparation and preservation of compromised skin grafts

T86.820 – T86.829	Skin graft (allograft) rejection

- Acute traumatic peripheral ischemia

Crush injuries and suturing of severed limbs

S07.0XXA – S07.9XXS	Crushing injury of head
S17.0XXA – S17.9XXS	Crushing injury of neck
S28.0XXA – S28.0XXS	Crushed injury of chest
S35.511A – S35.513S	Injury of iliac artery
S38.001A – S38.1XXS	Crushing injury of abdomen, lower back, pelvis and external genitals
S45.001A – S45.299S	Injury of axillary or brachial blood vessels
S47.1XXA – S47.9XXS	Crushing injury of shoulder and upper arm
S57.00XA – S57.82XS	Crushing injury of arm
S67.00XA – S67.92XS	Crushing injury of wrist, hand and fingers
S75.001A – S75.099S	Injury of femoral artery
S77.00XA – S77.22XS	Crushing injury of hip and thigh
S85.001A – S85.189S	Injury of lower leg blood vessels
S87.00XA – S87.82XS	Crushing injury of lower leg
S97.00XA – S97.82XS	Crushing injury of ankle and foot
T87.0X1 – T87.1X9	Complications peculiar to reattachment and amputation
T87.2	Complications of other reattached body part

- Progressive necrotizing infections (necrotizing fasciitis)

M72.6	Necrotizing fasciitis
M87.00 – M87.9	Idiopathic aseptic necrosis of bone
M90.50 – M90.59	Osteonecrosis in diseases classified elsewhere

- Gas gangrene

A48.0	Gas gangrene

- Diabetic wounds of the lower extremities

E08.50 – E08.59	Diabetes mellitus due to underlying condition with circulatory complications
E09.51 – E09.59	Drug or chemical induced diabetes mellitus with circulatory complications
E10.51 – E10.59	Type 1 diabetes mellitus with circulatory complications
E10.618	Type 1 diabetes mellitus with other diabetic arthropathy
E10.620	Type 1 diabetes mellitus with diabetic dermatitis

E10.621	Type 1 diabetes mellitus with foot ulcer
E10.622	Type 1 diabetes mellitus with other skin ulcer
E10.628	Type 1 diabetes mellitus with other skin complications
E10.65	Type 1 diabetes mellitus with hyperglycemia
E10.69	Type 1 diabetes mellitus with other specified complication
E11.51 –E11.59	Type 2 diabetes mellitus with diabetic peripheral angiopathy without gangreneE11.618Type 2 diabetes mellitus with other diabetic arthropathy
E11.620	Type 2 diabetes mellitus with diabetic dermatitis
E11.621	Type 2 diabetes mellitus with foot ulcer
E11.622	Type 2 diabetes mellitus with other skin ulcer
E11.628	Type 2 diabetes mellitus with other skin complications
E11.65	Type 2 diabetes mellitus with hyperglycemia
E11.69	Type 2 diabetes mellitus with other specified complication
E13.51 – E13.59	Other specified diabetes mellitus with circulatory complications
E13.618	Other specified diabetes mellitus with other diabetic arthropathy
E13.620	Other specified diabetes mellitus with diabetic dermatitis
E13.621	Other specified diabetes mellitus with foot ulcer
E13.622	Other specified diabetes mellitus with other skin ulcer
E13.628	Other specified diabetes mellitus with other skin complications
L88	Pyoderma gangrenosum
L08.1	Erythrsma

- Irradiation cystitis

N30.40	Irradiation cystitis without hematuria
N30.41	Irradiation cystitis with hematuria

- Idiopathic sudden sensorineural hearing loss

H91.20 - H92.23	Sudden idiopathic hearing loss

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