Clinical Policy: **Hyperbaric Oxygen Therapy**

Reference Number:IL.CP.MP. 552 Coding Implications
Last Review Date: 04/21 Revision Log

See Important Reminder at the end of this policy for important regulatory and legal information.

Definitions:

Hyperbaric oxygen therapy (HBOT)	Systemic treatment in which the patient is entirely enclosed in an air-tight chamber that is pressurized to 1.4 to 3.0 atmospheres absolute (atm abs or ATA) and breathing 100% oxygen. It is used to treat certain diseases and conditions which may improve when an increased partial pressure of oxygen is delivered and present in perfused tissues. Hyperbaric oxygen therapy serves four primary functions: 1. It increases the concentration of dissolved oxygen in the blood, which enhances perfusion; 2. It stimulates the formation of a collagen matrix so that new blood vessels may develop; 3. It replaces inert gas in the bloodstream with oxygen, which is then metabolized by the body; and it works as a bactericide.

Description

Policy/Criteria

Criteria for Coverage:

Systemic hyperbaric oxygen therapy (HBOT) may be appropriate and can be approved for the following conditions, within the limits outlined.

Specific Diagnoses:

1. **Emergent Conditions:**
   a. Acute arterial Air or Gas Embolism
   b. Acute carbon monoxide poisoning
   c. Clostridial myositis or myonecrosis (gas gangrene) with documentation of a Gram stain consistent with a Clostridial species
   d. Acute cyanide poisoning, after antidote administration has been given (with co-existing carbon monoxide poisoning)
   e. Decompression sickness or illness (“The Bends”)
   f. Progressive necrotizing soft tissue infections, including mixed aerobic and anaerobic infections (necrotizing fasciitis, Meleney's ulcer)
   g. Compromised skin grafts or flaps (i.e. preexisting grafts or flaps that are showing signs of failure or necrosis)
   h. Crush injuries, compartment syndrome and other acute traumatic ischemia in a salvageable area when loss of function, limb, or life is threatened and HBOT is used in combination with standard therapy.
   i. Acute peripheral arterial insufficiency.
   j. Central retinal artery occlusion.
   k. Exceptional blood loss anemia unresponsive to standard medical treatments

2. **Wounds and Ulcers**
   Prefacing Note: HBOT may be approved as an *adjunct* (not as a substitute) to standard wound care when there are no measurable signs of wound healing following at least 30 days of standard treatments. Standard wound care in patients with diabetic wounds includes all of the following conditions which must be met, and not limited to:
      i. Assessment of a patient's vascular status and appropriate correction of any vascular problems in the affected limb whenever medically appropriate,
      ii. Optimization of nutritional status and glucose control, Hbg A1C<9 or if >9, demonstration of a 2 point reduction during active wound management.
      iii. Appropriate debridement to remove devitalized tissue,
      iv. Maintenance of a clean, moist bed of granulation tissue with appropriate dressings,
   a. Non-healing infected deep ulcers in patients with Type 1 or Type 2 diabetes mellutis. Wounds that are classified as Wagner grade III (see appendix B 0 or higher).
   b. Chronic osteomyelitis refractory to standard medical and surgical management
      v. Medical management includes a six- week course of parenteral antibiotics
      vi. Sugical management includes at least one surgical eradication/debridement attempt, unless contraindicated
   c. Infections: There must be documentation of wound evaluation at least every 30 days during administration of HBOT. If wounds fail to show measurable signs of healing within 30 days of initiating HBOT, MHP considers continuation of HBOT treatments **not medically necessary.**

3. **Non-Emergent Conditions**
   a. Radiation tissue injury, chronic (e.g., osteoradionecrosis, soft tissue radiation necrosis, and related conditions except for those investigational indications listed in exclusions)
   b. Radiation tissue damage (non-neurologic tissue), delayed (osteoradionecrosis and soft tissue radionecrosis)
   c. Radiation-induced cystitis or hemorrhagic cystitis (i.e., resulting from chemolytic response, graft-versus-host disease [GVHD])
   d. Radiation-induced enterocolitis/proctitis
   e. Pre- and post-treatment for patients undergoing dental surgery (non-implant related) of an irradiated jaw
   f. Actinomycosis, only as an adjunct to conventional therapy when the disease process is refractory to antibiotics and surgical treatment
   g. Idiopathic sensorineural hearing loss (refractory to initial steroid therapy)

Absolute Contraindications:

Untreated pneumothorax is an absolute contraindication to HBOT.

Relative Contraindications:

Topical Hyperbaric Oxygen (THBO)

- MHP considers THBO experimental, investigational or unproven and is not covered because its efficacy has not been established through controlled clinical trials.

MHP considers HBOT experimental and investigational for members with any of the following contraindications to systemic HBOT, as the safety of systemic HBOT for persons with these contraindications to HBOT has not been established:

- Concurrent administration of doxorubicin, cisplatin, or disulfiram
- Premature infants (birth prior to 37 weeks gestation)

MHP considers the use of systemic HBOT experimental and investigational for all other conditions for which there is insufficient evidence in the medical literature that systemic HBOT is any more effective than conventional therapies. Below is a partial (but not all inclusive) list of these conditions:

1. Cutaneous, decubitus, and stasis ulcers
2. Chronic peripheral vascular insufficiency
3. Anaerobic septicemia and infection other than clostridial
4. Skin burns (thermal)
5. Cognitive Impairment (senility, senile dementia)
6. Myocardial infarction
7. Cardiogenic shock
8. Sickle cell anemia
9. Acute thermal and chemical pulmonary damage, i.e., smoke inhalation with pulmonary insufficiency
10. Acute or chronic cerebral vascular insufficiency
11. Hepatic necrosis
12. Aerobic septicemia/ Systemic aerobic infection
13. Nonvascular causes of chronic brain syndrome (Pick's, Alzheimer's, or Korsakoff's disease)
14. Tetanus
15. Organ transplantation
16. Organ storage
17. Pulmonary emphysema
18. Multiple Sclerosis
19. Arthritic Diseases
20. Acute cerebral edema
21. Inflammatory bowel disease (Crohn's, Ulcerative Colitis)
22. Anoxic brain injury/Traumatic brain injury

Coding Implications

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CPT®* Codes	Description

CPT®* Codes	Description

HCPCS ®* Codes	Description

ICD-10-CM Diagnosis Codes that Support Coverage Criteria
+ Indicates a code(s) requiring an additional character

ICD-10-CM Code	Description

Reviews, Revisions, and Approvals	Date	Approval Date
Original approval date		

State Letters/ Bulletins					
CMS National Coverage Determination (NCD)	NCD 20.29 Hyperbaric Oxygen Therapy (v.4, 12/2017)				
CMS Local Coverage Determination (LCD)					
Medicare Managed Care Manual:					
Medicaid CFR:	§270.4(A) §270.5				
State Administrative Codes:					
Contract Requirements:					
Related Policies:					

References

1. The Undersea and Hyperbaric Medical Society (UHMS), Hyperbaric Oxygen Therapy Committee. Guidelines: Indications for Hyperbaric Oxygen. Kensington, MD: UHMS; 2014.
2. Cierny G, Mader JT, Pennick JJ. A clinical staging system for adult osteomyelitis. Contemp Orthop 1985; 10:17–37.
3. Sheridan RL, Shank ES. Hyperbaric oxygen treatment: A brief overview of a controversial topic. J Trauma. 1999;47(2):426-435.
4. Saunders PJ. Hyperbaric oxygen therapy in the management of carbon monoxide poisoning, osteoradionecrosis, burns, skin grafts, and crush injury. Int J Technol Assess Health Care. 2003;19(3):521-525.
5. McDonagh M, Carson S, Ash J. Hyperbaric oxygen therapy for brain injury, cerebral palsy, and stroke. Evidence Report/Technology Assessment No. 85. Rockville, MD: Agency for Healthcare Research and Quality (AHRQ); 2003.
6. Bennett M, Heard R. Hyperbaric oxygen therapy for multiple sclerosis. Cochrane Database Syst Rev. 2004(1):CD003057.
7. NHS Quality Improvement Scotland (NHS QIS). Evidence note 15: Hyperbaric Oxygen Therapy (HBOT) for the prevention and treatment of osteoradionecrosis following radiotherapy of head and neck cancer. Glasgow, Scotland: NHS QIS; 2007.
8. Ritchie K, Baxter S, Craig J, et al. The clinical and cost-effectiveness of hyperbaric oxygen therapy. HTA Programme: Systemic Review 2. Glasgow, Scotland: NHS Quality Improvement Scotland (NHS QIS); July 2008.
9. Mechem, CC., Manaker, S. Hyperbaric Oxygen Therapy. In: UpToDate, Basow, DS (ed), Watham, MA, UpToDate, Inc., February 20, 2018.
10. U.S. Department of Health and Human Services. Health Care Financing Administration. Hyperbaric Oxygen Therapy. Coverage Issues Manual §35-10. Baltimore, MD: HCFA; October 19, 2000.
11. Raman G, Kupelnick B, Chew P, Lau J. A horizon scan: Uses of hyperbaric oxygen therapy. Technology Assessment Report. Prepared by the Tufts-New England Medical Center Evidence Based Practice Center for the Agency for Healthcare Research and Quality (AHRQ). Rockville, MD: AHRQ; October 5, 2006.
12. Lawson R. Hyperbaric oxygen for osteomyelitis. STEER: Succint and Timely Evaluated Evidence Reviews. Bazian Ltd., eds. London, UK: Wessex Institute for Health Research and Development, University of Southampton; 2003; 3(18).
13. Up to Date: Hyperbaric Oxygen Therapy. Topic 326 Version 22.0 [Accessed April 21, 2021]
14. Up to Date: Sudden sensorineural hearing loss in adults: Evaluation and management. Topic 6847 Version 48.0. [Accessed April 21, 2021]
15. Michigan Department of Health and Human Services, Medicaid Provider Manual. Hospital, Sec. 3.16. Last revised: April 1, 2021.
16. National Coverage Determination (NCD) for Hyperbaric Oxygen Therapy (20.29). Centers for Medicare and Medicaid Services. https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?ncdid=12&ncdver=4&keyword=Hyperbaric%20oxygen%20therapy&keywordType=starts&areaId=all&docType=NCA,CAL,NCD,MEDCAC,TA,MCD,6,3,5,1,F,P&contractOption=all&sortBy=relevance&bc=AAAAAAQAAAAA&KeyWordLookUp=Doc&KeyWordSearchType=Exact [Accessed April 21, 2021]

Important Reminder

This clinical policy has been developed by appropriately experienced and licensed health care professionals based on a review and consideration of currently available generally accepted standards of medical practice; peer-reviewed medical literature; government agency/program approval status; evidence-based guidelines and positions of leading national health professional organizations; views of physicians practicing in relevant clinical areas affected by this clinical policy; and other available clinical information. The Health Plan makes no representations and accepts no liability with respect to the content of any external information used or relied upon in developing this clinical policy. This clinical policy is consistent with standards of medical practice current at the time that this clinical policy was approved. “Health Plan” means a health plan that has adopted this clinical policy and that is operated or administered, in whole or in part, by Centene Management Company, LLC, or any of such health plan’s affiliates, as applicable.

The purpose of this clinical policy is to provide a guide to medical necessity, which is a component of the guidelines used to assist in making coverage decisions and administering benefits. It does not constitute a contract or guarantee regarding payment or results. Coverage decisions and the administration of benefits are subject to all terms, conditions, exclusions and limitations of the coverage documents (e.g., evidence of coverage, certificate of coverage, policy, contract of insurance, etc.), as well as to state and federal requirements and applicable Health Plan-level administrative policies and procedures.

This clinical policy is effective as of the date determined by the Health Plan. The date of posting may not be the effective date of this clinical policy. This clinical policy may be subject to applicable legal and regulatory requirements relating to provider notification. If there is a discrepancy between the effective date of this clinical policy and any applicable legal or regulatory requirement, the requirements of law and regulation shall govern. The Health Plan retains the right to change, amend or withdraw this clinical policy, and additional clinical policies may be developed and adopted as needed, at any time.

This clinical policy does not constitute medical advice, medical treatment or medical care. It is not intended to dictate to providers how to practice medicine. Providers are expected to exercise professional medical judgment in providing the most appropriate care, and are solely responsible for the medical advice and treatment of members/enrollees. This clinical policy is not intended to recommend treatment for members/enrollees. Members/enrollees should consult with their treating physician in connection with diagnosis and treatment decisions.

Providers referred to in this clinical policy are independent contractors who exercise independent judgment and over whom the Health Plan has no control or right of control. Providers are not agents or employees of the Health Plan.

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Note: For Medicaid: Coverage is based on medical necessity criteria being met and the codes being submitted and considered for review being included on the Illinois Medicaid Fee Schedule (located at: http://www.illinois.gov/hfs/MedicalProviders/MedicaidReimbursement/Pages/default.aspx). If there is a discrepancy between this policy and the Illinois Medicaid Provider Manual (located at: http://www.illinois.gov/hfs/MedicalProviders/Handbooks/Pages/default.aspx) the applicable Medicaid Provider Manual will govern.

Note: For Medicaid members/enrollees, when state Medicaid coverage provisions conflict with the coverage provisions in this clinical policy, state Medicaid coverage provisions take

precedence. Please refer to the state Medicaid manual for any coverage provisions pertaining to this clinical policy.

Appendix A[1]

Cierny-Mader Staging System for Osteomyelitis

Anatomic type	
Stage 1: medullary osteomyelitis	
Stage 2: superficial osteomyelitis	
Stage 3: localized osteomyelitis	
Stage 4: diffuse osteomyelitis	
Physiologic class	
A host: healthy	
B host:	
	Bs: systemic compromise
	Bl: local compromise
	Bls: local and systemic compromise
C host: treatment worse than the disease	
Factors affecting immune surveillance, metabolism and local vascularity	
Systemic factors (Bs): malnutrition, renal or hepatic failure, diabetes mellitus, chronic hypoxia, immune disease, extremes of age, immunosuppression or immune deficiency	
Local factors (Bl): chronic lymphedema, venous stasis, major vessel compromise, arteritis, extensive scarring, radiation fibrosis, small-vessel disease, neuropathy, tobacco abuse	

Appendix B

Wagner Ulcer Classification System:

Adapted from Wagner FW Jr. The diabetic foot. Orthopedics

Grade	***Lesion***
0	No open lesions; may have deformity or cellulitis
1	Superficial diabetic ulcer (partial or full thickness)
2	Ulcer extension to ligament, tendon, joint capsule, or deep fascia without abscess or osteomyelitis
3	Deep ulcer with abscess, osteomyelitis, or joint sepsis
4	Gangrene localized to portion of forefoot or heel
5	Extensive gangrenous involvement of the entire foot

[1] *Adapted from Cierny G, Mader JT, Pennick JJ. A clinical staging system for adult osteomyelitis. Contemp Orthop 1985; 10:17–37.*