

Policy: MP047

Section: Medical Benefit Policy

Subject: Hyperbaric Oxygen Therapy

Applicable line of business:

Commercial	x	Medicaid	x
Medicare	x	ACA	x
CHIP	x		

I. Policy: Hyperbaric Oxygen Therapy

II. Purpose/Objective:

To provide a policy of coverage regarding Hyperbaric Oxygen Therapy

III. Responsibility:

- A. Medical Directors
- B. Medical Management Department

IV. Required Definitions

1. Attachment – a supporting document that is developed and maintained by the policy writer or department requiring/authoring the policy.
2. Exhibit – a supporting document developed and maintained in a department other than the department requiring/authoring the policy.
3. Devised – the date the policy was implemented.
4. Revised – the date of every revision to the policy, including typographical and grammatical changes.
5. Reviewed – the date documenting the annual review if the policy has no revisions necessary.

Commercial

Geisinger Health Plan may refer collectively to health care coverage sponsors Geisinger Health Plan, Geisinger Quality Options, Inc., and Geisinger Indemnity Insurance Company, unless otherwise noted. Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

Medicare

Geisinger Gold Medicare Advantage HMO, PPO, and HMO D-SNP plans are offered by Geisinger Health Plan/Geisinger Indemnity Insurance Company, health plans with a Medicare contract. Continued enrollment in Geisinger Gold depends on contract renewal. Geisinger Health Plan/Geisinger Indemnity Insurance Company are part of Geisinger, an integrated health care delivery and coverage organization.

CHIP

Geisinger Health Plan Kids (GHP Kids) is a Children's Health Insurance Program (CHIP) offered by Geisinger Health Plan in conjunction with the Pennsylvania Department of Human Services (DHS). Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

Medicaid

Geisinger Health Plan Family (GHP Family) is a Medical Assistance (Medicaid) insurance program offered by Geisinger Health Plan in conjunction with the Pennsylvania Department of Human Services (DHS). Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

V. Additional Definitions

Medical Necessity or Medically Necessary means Covered Services rendered by a Health Care Provider that the Plan determines are:

- a. appropriate for the symptoms and diagnosis or treatment of the Member's condition, illness, disease or injury;
- b. provided for the diagnosis, and the direct care and treatment of the Member's condition, illness disease or injury;
- c. in accordance with current standards of good medical treatment practiced by the general medical community;
- d. not primarily for the convenience of the Member, or the Member's Health Care Provider; and the most appropriate source or level of service that can safely be provided to the Member. When applied to hospitalization, this further means that the Member requires acute care as an inpatient due to the nature of the services rendered or the Member's condition, and the Member cannot receive safe or adequate care as an outpatient.

Medicaid Business Segment

Medically Necessary — A service, item, procedure, or level of care that is necessary for the proper treatment or management of an illness, injury, or disability is one that:

- Will, or is reasonably expected to, prevent the onset of an illness, condition, injury or disability.
- Will, or is reasonably expected to, reduce or ameliorate the physical, mental or developmental effects of an illness, condition, injury or disability.
- Will assist the Member to achieve or maintain maximum functional capacity in performing daily activities, taking into account both the functional capacity of the Member and those functional capacities that are appropriate for Members of the same age

DESCRIPTION:

Hyperbaric Oxygen Therapy (HBO) is a systemic treatment in which the patient is placed inside a pressurized chamber and breathes 100% oxygen under increased atmospheric pressure.

INDICATIONS:

Primary Treatment

- Decompression sickness
- Carbon monoxide poisoning (acute) if any of the following are present:
 - Transient or prolonged unconsciousness
 - Abnormal neurological signs
 - Cardiovascular dysfunction
 - Severe acidosis
- Air or Gas Embolism (acute)
- Gas gangrene
- Cyanide poisoning (acute)
- Progressive necrotizing infections
- Acute peripheral artery insufficiency
- Emergency treatment of compromised skin graft/flap refractory to maximized wound care
- Chronic refractory osteomyelitis

Adjunctive Treatment (in addition to standard therapeutic measures, or when other treatments alone are not providing positive outcomes)

- Acute traumatic peripheral ischemia, crush injuries and suturing of severed limbs
- Osteoradionecrosis
- Soft tissue radionecrosis
- Chronic refractory osteomyelitis
- Actinomycosis
- Problem diabetic wound management
 - Documented evidence of type 1 or 2 diabetes with lower extremity wound, grade III or higher, when no measurable signs of healing are achieved for at least 30 consecutive days, and after an adequate course of standard wound care* has been completed.

*The components of standard wound care for diabetic wounds includes:

Assessment of vascular status and correction of any vascular problem in the affected limb if possible; and

Debridement of devitalized tissue; and
Maintenance of a clean, moist bed of granulation tissue with appropriate moist dressings; and
Optimization of glucose control and nutritional status; and
Appropriate off-loading; and
Appropriate and necessary treatment to resolve any infection, if present.

MEDICARE BUSINESS SEGMENT: See NCD 20.29 Hyperbaric Oxygen Therapy

EXCLUSIONS:

The following indications lack sufficient scientific evidence of efficacy, and therefore are considered **experimental, investigational or unproven** and are **NOT COVERED**. The list of such indications includes, but is not limited to:

- Acute traumatic brain injury
- Spinal cord injury
- Severe or refractory perineal Crohn's disease
- Acute thermal burns
- Carbon tetrachloride poisoning
- Cerebrovascular accident (thrombotic or embolitic)
- Fracture healing
- Hydrogen sulfide poisoning
- Intra-abdominal or intracranial abscess
- Pseudomembranous colitis
- Radiation myelitis
- Sickle cell crisis
- Multiple sclerosis
- Myofascial pain syndrome
- Retinal artery insufficiency
- Cerebral palsy
- Necrotizing arachnidism associated with brown recluse spider bites
- Autism (unless otherwise mandated by Act 62)*
- Chronic non-diabetic wounds
- Demyelinating disease
- Migraine or cluster-type headache

*For additional information please see **MP 233 - Autism Spectrum Disorder – Evaluation and Medical Management**

The Plan considers the use of topical hyperbaric oxygen therapy administered to the open wound in small limb-encasing devices **experimental, investigational or unproven** because the current body of evidence in the peer-reviewed, published medical literature supporting the use of topical oxygenation for any indication is insufficient to allow adequate conclusions regarding efficacy.

For more information, please refer to MP 224 – Topical Oxygenation

Medicaid Business Segment:

Any requests for services, that do not meet criteria set in the PARP, may be evaluated on a case by case basis

Note: A complete description of the process by which a given technology or service is evaluated and determined to be experimental, investigational or unproven is outlined in MP 15 - Experimental Investigational or Unproven Services or Treatment.

CODING ASSOCIATED WITH: Hyperbaric oxygen therapy

The following codes are included below for informational purposes and may not be all inclusive. Inclusion of a procedure or device code(s) does not constitute or imply coverage nor does it imply or guarantee provider reimbursement. Coverage is determined by the member specific benefit plan document and any applicable laws regarding coverage of specific services. Please note that per Medicare coverage rules, only specific CPT/HCPCS Codes may be covered for the Medicare Business Segment. Please consult the CMS website at www.cms.gov or the local Medicare Administrative Carrier (MAC) for more information on Medicare coverage and coding requirements.

99183 Physician attendance and supervision of hyperbaric oxygen therapy, per session

A4575: Topical Hyperbaric Oxygen Chamber, disposable
G0277 Hyperbaric oxygen under pressure, full body chamber, per 30-minute interval

Current Procedural Terminology (CPT®) © American Medical Association: Chicago, IL

LINE OF BUSINESS:

Eligibility and contract specific benefit limitations and/or exclusions will apply. Coverage statements found in the line of business specific benefit document will supercede this policy. For Medicare, applicable LCD's and NCD's will supercede this policy. For PA Medicaid Business segment, this policy applies as written.

REFERENCES:

Beckman TJ, "A Review of Decompression Sickness and Arterial Gas Embolism", Archives of Family Medicine 6(5):491-494, Sept/ Oct 1997.

Wunderlich RP, Peters EJG, Lavery LA, "Systemic Hyperbaric Oxygen Therapy: Lower Extremity Wound Healing and the Diabetic Foot", Diabetes Care 23(10):1551-1555, Oct 2000.

Coric V, Oren DA, Wolkenberg FA, Kravitz RE, "Carbon-monoxide Poisoning and Treatment with Hyperbaric Oxygen in the Subacute Phase", Journal of Neurology, Neurosurgery and Psychiatry, 65(2):245-247, Aug 1998.

Montesersky JH, Myers RAM, "Hyperbaric Oxygen Treatment of Necrotizing Fasciitis", American Journal of Surgery, 169(1):187-188, Jan 1995.

Tibbles PM, Edelsberg JS, "Medical Progress: Hyperbaric-Oxygen Therapy", The New England Journal of Medicine, 334(25):1642-1648, 20 June 1996.

McEwenn AW, Smith MB, "Chronic Venous Ulcer: Hyperbaric Oxygen Treatment is a Cost Effective Option", British Medical Journal, 315(7101):188-189, 19 July 1997.

Ernst A, Zibral JB, "Current Concepts: Carbon Monoxide Poisoning", New England Journal of Medicine, 339(22):1603-1608, 26 Nov 1998.

Leach RM, Rees PJ, Wilshurst P, "ABC of Oxygen: Hyperbaric Oxygen Therapy", British Medical Journal, 317(7166):1140-1143, 24 Oct 1998.

Merck Manual, Sec. 21, Ch. 292, Hyperbaric Oxygen Therapy

American College of Hyperbaric Medicine, "Medicare Accepted Indications",
<http://www.hyperbaricmedicine.org/indications>

Technology Evaluation Center, TEC Evaluation. "Hyperbaric Oxygen Therapy for Wound healing – Part I" August 1999; 14(13):1-35.

Technology Evaluation Center, TEC Evaluation. "Hyperbaric Oxygen Therapy for Wound Healing – Part II", December 1999; 14(15): 1-33.

Technology Evaluation Center, TEC Evaluation. "Hyperbaric Oxygen Therapy for Wound Healing – Part III", December 1999; 14(16): 1-27.

Sheridan RL, Shank ES, "Hyperbaric Oxygen Treatment: A Brief Overview of a Controversial Topic", The Journal of Trauma, 47(2):426-435, August 1999.

Centers for Medicare & Medicaid Services, Transmittal #AB-02-183 (CR2388)

Centers for Medicare & Medicaid Services, NCD Hyperbaric Oxygen Therapy 20.29

ECRI. HTAIS Custom Hotline Response (online) Hyperbaric Oxygen Therapy for Infection. Current as of June 6, 2006.

Rossignol DA, Rossignol LW, Smith S, Schneider C, Logerquist S, Usman A, Neubrandner J, Madren EM, Hintz G, Grushkin B, Mumper EA. Hyperbaric treatment for children with autism: a multicenter, randomized, double-blind, controlled trial. BMC Pediatr. 2009 Mar 13;9:21.

Kiralp MZ, Uzun G, Dinçer O, et al. A novel treatment modality for myofascial pain syndrome: Hyperbaric oxygen therapy. *J Natl Med Assoc.* 2009;101(1):77-80.

American Cancer Society "Hyperbaric Oxygen Therapy" reviewed on April 14, 2011 available at: <http://www.cancer.org/Treatment/TreatmentsandSideEffects/ComplementaryandAlternativeMedicine/HerbsVitaminsandMinerals/hyperbaric-oxygen-therapy>. Accessed on July 19, 2011

Boudreau R, Moulton K, McGill S. Hyperbaric oxygen therapy for difficult wound healing: Systematic review of clinical effectiveness and cost-effectiveness. Ottawa: Canadian Agency for Drugs and Technologies in Health; 2010.

Levett D, Bennett MH, Millar I. Adjunctive hyperbaric oxygen for necrotizing fasciitis. *Cochrane Database Syst Rev.* 2015;(1):CD007937

Paquette IM, Vogel JD, Abbas MA, et al; Clinical Practice Guidelines Committee of The American Society of Colon and Rectal Surgeons. The American Society of Colon and Rectal Surgeons clinical practice guidelines for the treatment of chronic radiation proctitis. *Dis Colon Rectum.* 2018;61(10):1135-1140

Golledge J, Singh TP. Systematic review and meta-analysis of clinical trials examining the effect of hyperbaric oxygen therapy in people with diabetes-related lower limb ulcers. *Diabet Med.* 2019; 36(7):813-82

Brouwer RJ, Laliou RC, Hoencamp R et al. A systematic review and meta-analysis of hyperbaric oxygen therapy for diabetic foot ulcers with arterial insufficiency. *J Vasc Surg.* 2020;71(2):682-692.

Laliou RC, Brouwer RJ, Ubbink DT et al. Hyperbaric oxygen therapy for nonischemic diabetic ulcers: A systematic review. *Wound Repair Regen.* 2020;28(2):266-275.

Gorenstein SA, Castellano ML, Slone ES, et al. Hyperbaric oxygen therapy for COVID-19 patients with respiratory distress: Treated cases versus propensity-matched controls. *Undersea Hyperb Med.* 2020 Third-Quarter;47(3):405-413

Thibodeaux K, Speyrer M, Raza A, et al. Hyperbaric oxygen therapy in preventing mechanical ventilation in COVID-19 patients: A retrospective case series. *J Wound Care.* 2020;29(Sup5a):S4-S8.

UHMS Position Statement: Hyperbaric Oxygen (HBO2) for COVID-19 Patients. *Undersea Hyperb Med.* 2020 Second-Quarter;47(2):297-298.

Undersea and Hyperbaric Oxygen Medical Society (UHMS). HBO2 for COVID-19: Clinical trials at clinicaltrials.gov. *Undersea Hyperb Med.* 2020 Second-Quarter;47(2):299-307.

Sharma R, Sharma SK, Mudgal SK, et al. Efficacy of hyperbaric oxygen therapy for diabetic foot ulcer, a systematic review and meta-analysis of controlled clinical trials. *Sci Rep.* Jan 26 2021; 11(1): 2189.

Hedetoft M, Bennett MH, Hyldegaard O. Adjunctive hyperbaric oxygen treatment for necrotising soft-tissue infections: A systematic review and meta-analysis. *Diving Hyperb Med.* Mar 31 2021; 51(1): 34-43.

Cruz DLMDA, Oliveira-Pinto J, Mansilha A, et al. The role of hyperbaric oxygen therapy in the treatment of diabetic foot ulcers: A systematic review with meta-analysis of randomized controlled trials on limb amputation and ulcer healing. *Int Angiol.* 2022;41(1):63-73

Stizzo M, Manfredi C, Spirito L, et al. Hyperbaric oxygen therapy as adjuvant treatment for surgical site infections after male-to-female gender affirmation surgery: A 10-year experience. *Andrology.* 2022;10(7):1310-1316.

Zhang Z, Zhang W, Xu Y, Liu D. Efficacy of hyperbaric oxygen therapy for diabetic foot ulcers: An updated systematic review and meta-analysis. *Asian J Surg.* 2022;45(1):68-78.

Keohane C, Westby D, Nolan FC, et al. Hyperbaric oxygen as an adjunct in the treatment of venous ulcers: A systematic review. *Vasc Endovascular Surg.* 2023;57(6):607-616.

Meier EL, van der Molen DRM, Lansdorp CA, et al. Hyperbaric oxygen therapy for local late radiation toxicity in breast cancer patients: A systematic review. *Breast.* 2023;67:46-54.

Tao L, Yuan X. Efficacy and safety of hyperbaric oxygen therapy in the management of diabetic foot ulcers: A systematic review and meta-analysis. Int Wound J. 2023 Nov 21

This policy will be revised as necessary and reviewed no less than annually.

Devised: 10/99

Revised: 01/02, 02/02 (remove prior auth requirement), 02/03 (add definition); 6/03 (coding, added indications), 6/04 (Coding); 7/09 (autism ref); 7/10 (exclusion); 10/11 (indications, exclusions added), 10/12 (removed limitations) 9/24 (add Medicare NCD reference)

Reviewed: 6/05; 6/06; 6/07, 6/08, 8/11 10/13, 10/14, 10/15, 10/16, 9/17, 9/18, 9/19, 9/20, 9/21, 9/22, 9/23,

CMS UM Oversight Committee Approval: 12/23; 11/8/24

Geisinger Health Plan may refer collectively to health care coverage sponsors Geisinger Health Plan, Geisinger Quality Options, Inc., and Geisinger Indemnity Insurance Company, unless otherwise noted. Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

Coverage for experimental or investigational treatments, services and procedures is specifically excluded under the member's certificate with Geisinger Health Plan. Unproven services outside of an approved clinical trial are also specifically excluded under the member's certificate with Geisinger Health Plan. This policy does not expand coverage to services or items specifically excluded from coverage in the member's certificate with Geisinger Health Plan. Additional information can be found in MP015 Experimental, Investigational or Unproven Services.

Prior authorization and/or pre-certification requirements for services or items may apply. Pre-certification lists may be found in the member's contract specific benefit document. Prior authorization requirements can be found at <https://www.geisinger.org/health-plan/providers/ghp-clinical-policies>

Please be advised that the use of the logos, service marks or names of Geisinger Health Plan, Geisinger Quality Options, Inc. and Geisinger Indemnity Insurance Company on a marketing, press releases or any communication piece regarding the contents of this medical policy is strictly prohibited without the prior written consent of Geisinger Health Plan. Additionally, the above medical policy does not confer any endorsement by Geisinger Health Plan, Geisinger Quality Options, Inc. and Geisinger Indemnity Insurance Company regarding the medical service, medical device or medical lab test described under this medical policy.