



HYPERBARIC OXYGEN THERAPY FOR VASCULAR SURGERY

HyOx treats the following approved and covered conditions:

- Revascularization procedures in **chronic occlusive vascular disease** of the extremities, including:
 - Diabetic wounds of the lower extremity (i.e. basement membrane disease causing decrease flow)
 - Chronic, non-healing wounds / ulcers
 - Gas gangrene attributed to inadequate blood flow or arterial occlusive disease
- **Referral Protocol:**
 - Prior to and post-surgery in an irradiated area when viable tissue and vascularity are needed
 - Refer at 30 days in diabetic wounds (Wagner Grade III or higher)
 - When the wound has not shown significant progress with conventional treatment
- **Acute peripheral arterial insufficiency** (and chronic treatment in patients where arterial reconstruction is impossible)
 - **Referral Protocol:** When wound hypoxia and/or ischemia is identified with an angiogram signifying poor healing and/or amputation flap failure
- **Chronic refractory osteomyelitis**
 - **Referral Protocol:** When chronic osteomyelitis fails to respond to definitive surgical debridement and to heal after four to six weeks of antibiotic therapy
- **Necrotizing soft tissue infections**
 - **Referral Protocol:** Immediately, after wound culture or MRI shows progressive necrotizing soft tissue infection – refer in tandem with wound care, debridement and antibiotic therapy
- **Compromised flaps or grafts at amputation site**
 - **Referral Protocol:** Immediately, when post-surgical site shows signs of dehiscence, necrosis, blistering, erythema, and infection

Benefits of Hyperbaric Oxygen Therapy

- Enables vascular surgeons to gain time so collateral circulation can develop or a reconstructive procedure can be performed
- Accelerates healing of chronic wounds by maximizing oxygen delivery through the blood's plasma to encourage growth of new blood vessels in oxygen-deprived tissue - normal steps to wound healing are impaired due to inadequate perfusion and oxygen availability
- Decreases edema and helps resolve infection for wound repair
- Promotes fibroblast, collagen deposition, angiogenesis **(1)**, resistance to infection **(2)** and intracellular leukocyte bacterial killing - all oxygen sensitive responses essential to normal wound healing
- Establishes adequate oxygen availability within the vascularized connective tissue compartment that surrounds the wound to assist in wound repair
- Promotes vascular endothelial growth **(3)** factor and formation of granulation tissue
- Decreases the risk of amputation in patients with ischemic, infected, Wagner Grade III or worse diabetic lower extremity wounds and foot ulcers **(4)** or CLI patients due to gangrene progression or sepsis **(5)**
- Helps resolve infections combined with antibiotic and surgical debridement by augmenting the transport of certain antibiotics across bacterial cell walls (antibiotic transport does not occur if oxygen tension levels are below 20 to 30 mmHg) **(6)**

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- (4)** Kranke P, Bennett M, Roedel-Wiedmann I, Debus S. Hyperbaric oxygen therapy for chronic wounds (Cochrane Review). In: *The Cochrane Library*, Issue 2, 2004. Chichester, UK: John Wiley & Sons, Ltd.
- (5)** Novo S, Coppola G, Milio G. (2004). Critical Limb Ischemia: Definition and Natural History. *Current Drug Targets-Cardiovascular & Hematological Disorders*, 4, 219-225.
- (6)** Mader JT, et al. Hyperbaric oxygen as adjunctive therapy for osteomyelitis. *Infect Dis Clin North Am*, 1990. 4(3): 433-40.

