



HYPERBARIC OXYGEN THERAPY FOR RADIATION ONCOLOGY

HyOx treats the following approved and covered conditions:

- **Delayed radiation tissue injuries:**
 - Osteoradionecrosis (ORN)
 - Soft tissue radionecrosis (STRN)
 - Mandibular necrosis
 - Radiation cystitis and proctitis
 - **Referral Protocol:** Immediately, upon symptom manifestation of the delayed effects of radiation injury
- **Prophylactic pre- and post- treatment for patients undergoing invasive dental surgery to a previously radiated jaw**
 - **Referral Protocol:** Prior to surgical intervention including tooth extraction; number of hyperbaric oxygen treatments needed is dependent on the severity utilizing Marx's staging system (I - III)
 - Usually 30 treatments preoperative and 10 treatments postoperative (1)
- **Chronic, non-healing wound in a previously radiated area (pre- and post-operative hyperbaric oxygen treatment required)**
 - **Referral Protocol:** Immediately, upon symptom manifestation of the delayed effects of radiation injury
- **Mandibular osteomyelitis**
 - **Referral Protocol:** When mandibular osteomyelitis fails to respond to definitive surgical debridement and to heal after four to six weeks of antibiotic therapy (2)

Benefits of Hyperbaric Oxygen Therapy:

- Speeds the recovery of soft tissues and bone affected by radiation therapy's fibro-atrophic effect **(3)** manifested by vascular changes characterized by obliterative endarteritis
- Boosts the viability and vascularity of previously irradiated breast tissue for augmentations or reductions
- Enhances angiogenesis in hypoxic tissues **(4)** and bone as ORN is a result of an avascular, aseptic necrosis
- Restores immune mechanisms that have become dysfunctional due to hypoxia which affects neutrophilic killings of organisms as phagocytosis becomes inefficient
- Re-establishes mandibular continuity in dentures and helps rehabilitation for cosmesis and mastication **(5)**
- Supports initial tissue metabolic demands post-reconstructive surgery for ORN
- 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)**
- Resolves hematuria in radiation cystitis patients **(7)**

REFERENCES:

- (1)** Marx, RE, Ames JR. The use of hyperbaric oxygen in bony reconstruction of the irradiated and tissue deficient patient. *J Oral Maxillofac Surg* 1982; 40:412-9.
- (2)** Waldvogel FA, G Medoff and MN Swartz. Osteomyelitis: A review of clinical features, therapeutic considerations and unusual aspects (second of three parts). *N Engl J Med* 1970. 282(5): p. 260-261.
- (3)** Delanian S, Lefaix J. Current management for late normal tissue injury: radiation-induced fibrosis and necrosis. *Semin Radiat Oncol* 2007; 17:99-107.
- (4)** Marx RE, EHler WJ, Tayapongsak P, Pierce LW. Relationship of oxygen dose to angiogenesis induction in irradiated tissue. *Am J Surg* 1990; 160: 519-524.
- (5)** Marx RE. Radiation injury to tissue. In: Kindwall EP, ed. *Hyperbaric Medicine Practice, Second Edition*. Flagstaff, Best Publishing, 1999, pp. 665-723.
- (6)** Mader JT, et al. Hyperbaric oxygen as adjunctive therapy for osteomyelitis. *Infect Dis Clin North Am*, 1990. 4(3): 433-40.
- (7)** Corman JM, McClure D., Pritchett R, Kozlowski P, Hampson NB. Treatment of radiation induced hemorrhagic cystitis with hyperbaric oxygen. *J Urol* 2003; 160: 2200-2.

