



## **HYPERBARIC OXYGEN THERAPY FOR ONCOLOGY**

**HyOx treats the following approved and covered cancer-related complications:**

- **Side Effects of Chemotherapy** - A suppressed immune system can lead to infections and non-healing wounds. Hyperbaric oxygen therapy's therapeutic and healing benefits:
  - Advances recovery to reduce the effects of chronic pain and swelling, and, anecdotally in some patients diminishes "chemo brain" symptoms
  - Expedites wound healing by supersaturating the plasma with 100 percent oxygen under pressure to create new cells and pathways for blood flow
  - Helps new capillaries and blood vessels form (angiogenesis) in tissues starving for oxygen
  - Promotes collagen formation
  - Boosts the effectiveness of certain antibiotics - an oxygen dependent function
- **Breast (Pre- & Post-Reconstruction Surgery)** - Supersaturating the previously radiated breast tissue with oxygen better prepares the surgical site pre-surgically and then post for reconstruction or augmentation to create new pathways for oxygen to the compromised tissue and reduce swelling and fibrosis.
- **Delayed Radiation Injury** - Much of the oxygen content in radiated tissues and bones is lost while undergoing radiation therapy and, in some patients, injury is caused in the surrounding areas resulting in soft tissue radionecrosis and osteoradionecrosis. The damaging, gradual effects of radiation therapy may manifest months, even years, after cancer treatment.
  - **Referral Protocol:** Pre-surgery to increase the viability of irradiated tissues and post to continue the healing process with oxygen saturation and collagen production.
- **Marx Protocol for Head & Neck** - Oral and maxillofacial surgeons and dentists follow the evidence-based **Marx Protocol** for hyperbaric oxygen therapy prior to oral surgeries including tooth extractions in head and neck cancer survivors with heavily irradiated jaws. Treatment continues post-surgery to help support tissue metabolic demands in the healing process.

- **Prostate & Pelvic** - The endothelial damage, decreased blood flow and oxygenation to the pelvic tissues because of radiation therapy for pelvic malignancies causes injuries such as radiation cystitis (bladder) and proctitis (prostate) that are difficult to treat without hyperbaric oxygen therapy intervention.
- **Necrotizing soft tissue infections (zygomycosis)**
  - **Referral Protocol:** In the acute phase, after a wound culture, MRI or bone biopsy show progressive necrotizing infection to prohibit infection growth by boosting the effectiveness of antibiotic therapy and surgical debridement.

## Benefits of Hyperbaric Oxygen Therapy

- Speeds the recovery of soft tissues and bone affected by radiation therapy's fibro-atrophic effect **(1)** manifested by vascular changes characterized by obliterative endarteritis
- Enhances angiogenesis in hypoxic tissues **(2)**
- 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 but also rehabilitation with a denture for cosmesis and mastication **(3)**
- 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) **(4)**
- Inhibits fungal growth in zygomycosis, corrects lactic acidosis to promote the oxidative action of amphotericin B and contributes to tissue healing by significantly elevating tissue oxygen levels, enhancing leukocyte-mediated phagocytosis and promoting angiogenesis and healing **(5)**

### REFERENCES:

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- (3) Marx RE. Radiation injury to tissue. In: Kindwall EP, ed. *Hyperbaric Medicine Practice*, Second Edition. Flagstaff, Best Publishing, 1999, pp. 665-723.
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- (5) John, BV, Chamilos, G, Kontoyiannis, P. Hyperbaric oxygen as an adjunctive treatment for zygomycosis. Department of Infectious Diseases, Infection Control and Employee Health, The University of Texas MD Anderson Cancer Center, Houston, TX. *European Society of Clinical Microbiology and Infectious Disease*. 2005

