HYPERBARIC MEDICINE HEALS.

HYPERBARIC OXYGEN THERAPY FOR GENERAL SURGERY

HyOx treats the following covered and approved complications:

- **Delayed effects of radiation therapy (soft tissue radionecrosis and osteoradionecrosis)**
  - ***Referral Protocol:*** Pre- and post-operatively in a previously irradiated area to make tissues and bone more viable and to reverse the effects of radiation damage
- **Compromised skin grafts and flaps**
  - ***Referral Protocol:***
    - Immediately, to preserve a flap or graft when post-surgical site shows signs of dehiscence, necrosis, blistering, erythema, and infection
    - Post-fasciotomy with one of the following: manifestations of ischemic muscle, residual neuropathy, if demarcation of viable and non-viable muscle is unclear, massive swelling/prolonged ischemia, threatened skin graft/flap, or a markedly impaired or decompensated host
- **Necrotizing soft tissue infections (including necrotizing fasciitis, gas gangrene)**
  - ***Referral Protocol:*** Immediately, in the acute phase, after a wound culture, MRI or bone biopsy show necrotizing bone or soft tissue infection – when anatomic levels of involvement of skin, superficial or deep fascia and muscle involvement can be assessed by biopsy, MRI and deep tissue cultures
- **Crush injuries and skeletal muscle-compartment syndromes**
  - ***Referral Protocol:*** Immediately, to increase tissue oxygen tensions to sufficient levels post-crush injury and prevent progression of skeletal muscle-compartment syndromes
- **Chronic refractory osteomyelitis**
  - ***Referral Protocol:*** When osteomyelitis fails to respond to definitive surgical debridement and heal after four to six weeks of antibiotic therapy

Benefits of Hyperbaric Oxygen Therapy:

- Reduces the complications prior to and following surgeries in a previously radiated area
- Helps manage open-fracture crush injuries reducing complication rates by supplementing oxygen availability to hypoxic tissue during the early post-injury period when perfusion is likely inadequate
- Stimulates angiogenesis in oxygen-deprived and infected tissue (**1**)
- Salvages free skin grafts, pedicle, random and irradiated wound flaps, composite grafts, and free flaps
- Supersaturates the body with oxygen to promote healing of hypoxic tissue (**2**) to reduce the need for re-grafting and repeat flap procedures
- Works synergistically with antibiotic therapy and surgical debridement to boost healing in soft tissue infections thereby reducing morbidity and mortality rates (**3**)
- Reduces edema and/or bleeding within fascial envelope thereby reducing pressure within skeletal muscle-compartment (**4**)
- Speeds recovery of chronic, non-healing wounds by infection control, blood flow optimization along with other interventions such as negative pressure wound therapy, bioengineered tissue grafts and surgical reconstruction or closure
- Reduces the risk of major amputation involving patients with diabetic ulcers (**5**)
- Improves oxygenation through angiogenesis, induces neovascularization and reduces fibrosis in irradiated tissue (**6**)

REFERENCES:

(**1**) Hunt TK, M Linsey, et al. The effect of differing ambient oxygen tension on wound infection. Ann Surg (1975). 181: 35-39.

(**2**) Friedman HI, Fitzmaurice M, Lefaivre JF, et al. An evidence-based appraisal of the use of hyperbaric oxygen therapy on flaps and grafts. Plast Reconstr Surg. 117 (Suppl): 175S-190S, 2006.

(**3**) Hollabaugh RS, Dmochowski RR, Hickerson WL. Fournier's Gangrene: Therapeutic impact of hyperbaric oxygen. Plast Reconstr Surg 1998; 101: 94-100.

(**4**) Skylar MJ, AR Hargens, et al. Hyperbaric oxygen reduced edema and necrosis of skeletal muscle in compartment syndromes associated with hemorrhagic hypotension. J Bone Joint Surg (1986). 68A: 1218-1224.

(**5**) Roeckl-Wiedmann I, M Bennett, P Kranke. Systematic review of hyperbaric oxygen in the management of chronic wounds. Br J Surg, 2005. 92 (1): p. 24.32.

(**6**) Marx RE, Ehler WJ, Tayapongsak P, Pierce LW. Relationship of oxygen dose to angiogenesis induction in irradiated tissue. Am J Surg 1990; 160: 519-24.