HYOX

HYPERBARIC MEDICINE HEALS.

HYPERBARIC OXYGEN THERAPY FOR HAND SURGERY

HyOx treats the following approved and covered complications:

- **Compromised skin grafts and flaps including severed limbs / fingers**
  - ***Referral Protocol:*** Immediately, to preserve a flap or graft when post-surgical site shows signs of dehiscence, necrosis, blistering, erythema, and infection and post-fasciotomy with one of the following: manifestations of ischemic muscle, residual neuropathy, if demarcation of viable and no-viable muscle is unclear, massive swelling/prolonged ischemia, threatened skin graft/flap, markedly impaired or decompensated host

- **Necrotizing soft tissue infections** (**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 including injection injuries and deglovings**
  - ***Referral Protocol:*** Immediately post injury to sufficiently increase tissue tensions to prevent progression of skeletal muscle-compartment syndrome

- **Chronic refractory osteomyelitis**
  - ***Referral Protocol:*** When osteomyelitis fails to respond to surgical debridement and four to six weeks of antibiotic therapy

- **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

Benefits of Hyperbaric Oxygen Therapy:

- 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 by supersaturating the body with oxygen to promote healing of hypoxic tissue (**2**) to reduce the need for re-grafting and repeat flap procedures
- 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 - 30 mmHg) (**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 / closure

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**) Verklin RM, Jr, GL Mandell. Alteration effects of hyperbaric oxygen on selected clostridial species I in vitro studies and II in vivo studies in mice. J Infect Dis 1972;125: 17B35.

(**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.