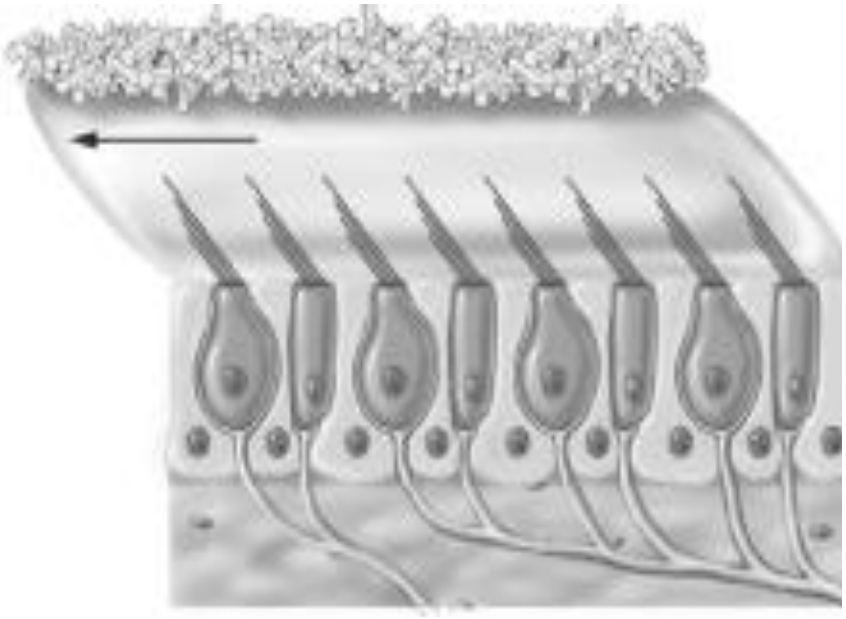
Introduction



HYPERBARIC OXYGEN THERAPY (HBOT)

Hyperbaric oxygen therapy (HBOT) involves the intermittent inhalation of 100 per cent oxygen in chambers pressurized above one atmosphere absolute. The treatment duration and number of sessions required depend on the reason for HBOT. Each treatment duration can vary from 45 to 300 minutes, although most treatments are in excess of 90 minutes, for a variable number of sessions ***(Al-Waili et al., 2005).***

HBO is designed to increase oxygen delivery to local ischemic tissue and by a variety of primary and secondary mechanism facilitates wound healing. It is a physiological process in which a patient breathes 100% oxygen intermittently while the pressure of the external environment is increased to greater than normal sea-level pressure usually 2-2.4 atmospheres absolute(ATA) ***(Tibbles and Edelsberg., 1996).***

Methods of administrations:

Systemic Hyperbaric Oxygen Pressurization

Hyperbaric oxygen therapy (HBOT) is a technique of delivering higher pressures of oxygen to the tissues. Two methods of administration are available. In systemic hyperbaric oxygen therapy, the patient is entirely enclosed in a pressurized chamber and breathes oxygen at a pressure greater than one atmosphere (the pressure of oxygen at sea level). Thus this technique relies on the systemic circulation to deliver highly oxygenated blood to the target site, typically a wound. In addition, systemic hyperbaric oxygen therapy can be used to treat systemic illness such as air or gas embolism, carbon monoxide poisoning, and clostridial gas gangrene. Treatment may be carried out either in a monoplace (one

person) chamber pressurized with oxygen or in a larger multiplace (two or more person) chamber pressurized with compressed air, in which case, the patient receives pure oxygen by mask, head tent, or endotracheal tube. ***(Faglia et al., 1996).***

Multiplace chambers:

These units can accommodate between 2-18 patients, depending upon configuration and size. They commonly incorporate a minimum pressure capability of 6 atmospheres absolute (ATA). Patients are accompanied by hyperbaric staff members, who may enter and exit the chamber during therapy. The multi-place chamber is compressed by air, and patients are provided with oxygen via an individualized internal delivery system ***(Edelsberg at al., 2002).***

They have many advantages which include Greater working pressure, Constant patient attendance, the Ability to use a variety of electrically generated signals during therapy, attendants are able to enter and exit during therapy, the ability to manage complications such as pneumothorax without releasing pressure and the ability to conduct intensive care activities during treatment. Their disadvantages are higher capitalization requirements, major space requirements; basement and/or ground floor level limitations, higher operating costs, larger and experienced staffing requirements, risk of

decompression sickness in internal personnel, all the patients are on the same protocol, uncertain oxygen delivery tension for the patient with face mask, maxillofacial and/or head and neck involvement possibly making effective delivery of oxygen difficult, facility fire-associated decompression requirements and Significant equipment maintenance and system upkeep requirements.

(Neumeister, 2005).

Monoplace chambers

These units, first introduced in the 1960's, are designed for single occupancy. They are constructed of acrylic, have a pressure capability of 3 ATA. Recent technical innovations have allowed critically-ill patients to undergo therapy in the mono-place chamber. The high flow oxygen requirement is supplied via the hospital's existing liquid oxygen system ***(Edelsberg el al., 2002).***

They have many Advantages which are relatively low purchase price, requires little space and relatively minor facility renovations, modest program capitalization, treatment protocol specific to patient and/or condition, modest staffing requirements, patient does not wear mask, hood or head tent for oxygen delivery, relatively mobile chamber for possible relocation, no risk of iatrogenic decompression sickness in patient or staff and add-on capability for ease of program expansion. Their disadvantages are Patient isolated during treatment, inability to suction patient, limited pressure capability (3 ATA), pure oxygen environment; associated fire hazard, inability to use certain diagnostic and/or therapeutic equipment and Increased risk of complications from pneumothorax and/or tension pneumothorax and arterial air embolism developing during decompression **(*Neumeister, 2005*).**

Topical Hyperbaric Oxygen Therapy

Topical hyperbaric oxygen therapy is a technique of delivering 100% oxygen directly to an open-moist wound at a pressure slightly higher than atmospheric pressure. It is hypothesized that the high concentrations of oxygen diffuse directly into the wound to increase the local cellular oxygen tension, which in turn promotes wound healing. Topical hyperbaric oxygen devices consist of an appliance to enclose the wound area (frequently an extremity) and a source of oxygen; conventional oxygen tanks may be used. The appliances may be disposable and may be used without supervision at home by well-trained patients. Topical hyperbaric oxygen therapy has been investigated as a treatment of skin ulcerations due to diabetes venous stasis, postsurgical infection, gangrenous lesion, decubitus ulcers, amputations, skin graft, burns and frostbite. ***(Edelsberg et al., 2002)***