

## Is it Time to Add Advanced Therapies such as Hyperbaric Oxygen Therapy?

During the natural wound healing process, the body uses oxygen to stimulate the healing and growth of new tissue. Hyperbaric oxygen therapy (HBOT) helps encourage the formation of new blood vessels around the wound area, and these blood vessels supply the area with more oxygen. This influx of oxygen and other healing nutrients helps generate new, healthy tissue. HBOT provides several benefits for individuals dealing with diabetic foot ulcers (DFUs) and other chronic wounds. The primary benefit is that it can speed up the healing process. A quicker recovery time can help patients living with diabetes regain the benefits of an active lifestyle and avoid complications that relate to foot ulcers. A 2018 study reported that HBOT was effective in treating 74.2% of diabetic foot ulcer cases. The use of HBOT dramatically improved the foot ulcer healing process compared with other treatment methods<sup>1</sup>.

Delayed healing of DFUs can decrease patient mobility, reduce quality of life, and increase risk of amputation<sup>2</sup>. Likewise, studies have shown that patients who have had one amputation have a 68% risk of having another in the next 5 years and have a 50% mortality rate in the 5 years following the initial amputation<sup>7</sup>. Moreover, DFUs remain difficult to heal even with good standard wound care. Interestingly, an ulcer is less likely to heal by 12 weeks if there is little reduction in wound area during the first 4 weeks of care. Therefore, 4 weeks may be used as a clinical decision point to re-evaluate current DFU management and if a 50 percent area reduction (PAR) is not achieved, a change in patient protocol of care is warranted. PAR by at least 50% at week 4 is the best prognostic indicator of healing by 12 weeks. This prognostic indicator of wound closure can alert clinicians to reassess the therapeutic approach and consider more advanced interventions, such as HBOT, if necessary<sup>2</sup>.

According to Medicare, standard or routine wound care includes: assessment of a patient's vascular status and correction of any vascular problems in the affected limb, if possible, optimization of nutritional status, optimization of glucose control, debridement by any means to remove devitalized tissue, maintenance of a clean, moist bed of granulation tissue with appropriate moist dressings, appropriate off-loading, and necessary treatment to resolve any infection that might be present<sup>3</sup>.

Various studies show that amputation rates are significantly lower in patients allocated to routine or standard care plus HBOT than with routine care alone. One such study found that amputation rates were lower in patients receiving adjunctive HBOT than in patients randomized to standard care alone. The amputation rate in the hyperbaric oxygen (HBO) group was 8.6% compared to 33.3% in the group who only received standard wound care<sup>4</sup>.

Reductions in the number of amputations is not the only positive outcome associated with the timely use of HBOT. For instance, studies have shown that limb salvage is both cost-effective and positively influences overall quality of life. The estimated cost for 29 HBO treatments in 2013 was \$17,114 vs. major LEA costs of \$57,135. Moreover, Guo, et al. used data from four prospective controlled clinical studies between 1987 and 1997 to develop a decision tree that predicted 205 major lower extremity amputations (LEAs) in the standard care group vs. 50 LEAs in the group with HBO<sup>5</sup>.

In another study from 2016, in terms of cost and mortality, Eggert and colleagues found that for Wagner grade 3 or 4 diabetic ulcerations, the average cost of a limb salvage protocol with HBOT is \$33,100 with 35.4 percent mortality within 15 months in comparison to \$66,000 to \$73,000 with 47.2 percent mortality within 15 months for patients undergoing lower extremity amputation<sup>6</sup>.

### References

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