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The use of hyperbaric oxygen therapy to treat chronic wounds: A review

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Chronic wounds, defined as those wounds which fail to proceed through an orderly process to produce anatomic and functional integrity, are a significant socioeconomic problem. A wound may fail to heal for a variety of reasons including the use of corticosteroids, formation of squamous cell carcinoma, persistent infection, unrelieved pressure, and underlying hypoxia within the wound bed. Hypoxia appears to inhibit the wound healing process by blocking fibroblast proliferation, collagen production, and capillary angiogenesis and to increase the risk of infection. Hyperbaric oxygen therapy (HBOT) has been shown to aid the healing of ulcerated wounds and demonstrated to reduce the risk of amputation in diabetic patients. However, the causal reasons for the response of the underlying biological processes of wound repair to HBOT, such as the up-regulation of angiogenesis and collagen synthesis are unclear and, consequently, current protocols remain empirical. Here we review chronic wound healing and the use of hyperbaric oxygen as an adjunctive treatment for nonhealing wounds. Databases including PubMed, ScienceDirect, Blackwell Synergy, and The Cochrane Library were searched for relevant phrases including HBOT, HBO/HBOT, wound healing, and chronic/nonhealing wounds/ulcers.