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Hyperbaric oxygen – its mechanisms and efficacy

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Background—This paper outlines therapeutic mechanisms of hyperbaric oxygen therapy (HBO2) and reviews data on its efficacy for clinical problems seen by plastic and reconstructive surgeons. Methods—The information in this review was obtained from the peer-reviewed medical literature. Results—Principal mechanisms of HBO2 are based on intracellular generation of reactive species of oxygen and nitrogen. Reactive species are recognized to play a central role in cell signal transduction cascades and the discussion will focus on these pathways. Systematic reviews and randomized clinical trials support clinical use of HBO2 for refractory diabetic wound healing and radiation injuries; treatment of compromised flaps and grafts and ischemia-reperfusion disorders is supported by animal studies and a small number of clinical trials, but further studies are warranted. Conclusions—Clinical and mechanistic data support use of hyperbaric oxygen for a variety of disorders. Further work is needed to clarify clinical utility for some disorders and to hone patient selection criteria to improve cost-efficacy.