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CRITICAL IMPORTANCE OF GLYCEMIC CONTROL IN HBO PATIENTS FOR LIMB SALVAGE

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Introduction/Background: Diabetic limb salvage management presents a significant challenge to wound care providers; numerous approaches to encourage healing in these difficult wounds have been explored in the past. Multiple researchers have demonstrated that glucose control is essential in the healing of diabetic foot ulcers, as uncontrolled diabetes severely impairs healing and that wound repair in diabetic patients is frequently beset by complications. But at what level does blood glucose interfere with wound repair?

Materials and methods: We searched Medline and Cumulative Index to Nursing and Allied Health Literature databases using the following search terms; diabetes mellitus, glucose, keratinocytes, fibroblast, wound healing, re-epithelization, HBO₂ and hyperbaric oxygen therapy. Surprisingly no articles related diabetic limb salvage, and recommended blood glucose levels with or without hyperbaric oxygen therapy was found.

Results: The rate of infection in diabetic patients post-surgery has been demonstrated to be 1.7% versus 0.4% for non-diabetics undergoing similar procedures. It has also been demonstrated in several research studies that cutaneous wound strength is strongly inhibited and associated with reduced accumulation of collagen. Hyperglycemia leads to osmotic diuresis and subsequent decreased oxygenation and perfusion. It limits PMN functioning and produces malnutrition by increasing hormones that cause catabolism. Under hyperglycemic conditions, keratinocytes demonstrate reduced migration and decreased proliferation capacities, which results in inadequate re-epithelization. These defective physiological events provide a possible explanation for the poor healing rates frequently observed in patients with diabetes mellitus.

Summary/Conclusions: Careful glucose control is one of the most important action health care providers can take to normalize healing in diabetic patients. Poorly controlled diabetes can delay healing up to three times the length of older non-diabetic patients. We will discuss the issues and suggest strategies for managing blood glucose levels in diabetic limb salvage.