



# Hyperbaric Oxygen Therapy Matters for Diabetic Foot Ulcers

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## Introduction

Adjunctive hyperbaric oxygen therapy (HBOT) is approved for diabetic foot ulcers (DFU) that have not improved despite standard wound treatment. Recently there have been conflicting reports about the efficacy of HBOT for DFU. The purpose of this study is to evaluate the effects of HBOT on reducing wound size for DFU patients treated at our facility.

## Methods

A retrospective review of patient records from 2007 to 2012 was done for diabetic outpatients and inpatients treated with HBOT at Loma Linda University Medical Center. Records of demographic data, indications for HBOT, and wound measurements before and after the last HBOT were collected. Only diabetic patients with an ulcer in the foot area were included in this study. All subjects received standard wound care at the wound clinic while undergoing HBOT.

Wound Area	Percent of Subjects	P-value
Decreasing	74 % (n=14)	P= 0.062
Decreasing >50%	63% (n=12)	P= 0.91
Increasing	26% (n=5)	P= 0.171

Table of wound size for DFU patients undergoing HBOT

## Results

Fifty-seven DFU patients were treated with HBOT. Twenty-one patients' records contained acceptable data for this study (see table). Patients ranged in age from 20 to 87 years with 12 males and 9 females. All HBOT treatments were performed at 2.0 ATA for 90 minutes 5 days a week for a total of 20 to 60 treatments. Two patients had less than 10 treatments and were excluded from the final wound evaluation. Upon one month follow-up visit post HBOT completion, 3 subjects had complete healing. There were no adverse effects from HBOT. Of the evaluable subjects none required amputation.

## Discussion

Diabetic foot ulcerations can involve partial to full thickness penetration in the dermis of the foot for patients suffering from diabetes mellitus. These wounds are often complicated by peripheral neuropathy, ischemia and infection. The standard treatment for diabetic foot ulcers is re-vascularization, relieving pressure on the ulcerated region, and administering an aggressive infection control.

HBOT increases tissue oxygenation and promotes wound healing by increasing fibroblast replication, collagen synthesis and neovascularization. For these reasons, HBOT has been shown to aid in healing diabetic foot ulcers when used as an adjunctive therapy.

## Conclusion

1. We found a trend toward significant reduction in wound size after a course of HBOT.
2. A more comprehensive study is underway to evaluate any beneficial effects of HBOT as an adjunctive therapy for DFU patients.