A Single Device (From AOTI) With Triple Therapy (Local Oxygen, Compression And Humidification) Enhances Healing Of Non-Healing Lower Extremity Wounds

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Disclosures

None

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Scientific Background

National Library of Medicine

Topical oxygen therapy-hocus pocus or science?

2 Andersen C.

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Share PMID: 33979228 **Free article.** No abstract available.

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Background

While the use of hyperbaric oxygen therapy has been supported by randomized prospective trials for the use of selective lower extremity wounds, it is associated with significant cost, inconvenience and has an incidence of complications related to increased systemic pressure

It is not recommended to routinely apply hyperbaric oxygen therapy to all patients with diabetic foot ulcers, especially those with non-ischemic diabetic foot ulcers.

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Multi-Modality Cyclical Pressurized Topical Oxygen -

OXYGEN
Higher pressure delivery results in greater tissue diffusion, upregulating wound metabolism, resulting in **faster and more durable healing.**

COMPRESSION
Non-contact, cyclical-compression helps to **reduce edema** and **enhance peripheral vascular circulation.**

HUMIDIFICATION
Assures an ideal wound healing environment for **effective healing.**

Extremity Chamber
for wounds on Extremities

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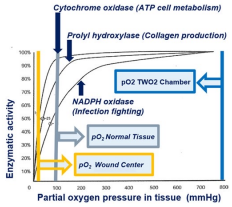
CPTO Therapy has Three Component Mechanisms

#1 - BENEFITS OF SUPPLEMENTAL OXYGEN

ATP synthesis runs almost at maximum activity at a pO_2 of 100 mmHg, whereas Collagen synthesis is at 80% activity & anti-microbial enzymes are only at 60% activity

Cyclical-pressurized topical oxygen raises pO2 above normal tissue levels to enhance all enzymatic activity

TWO2 provides the highest penetration of oxygen into the wounded tissue. The immediate availability of oxygen at a partial pressure of approximately 800 mmHg provides the greatest diffusion gradient into the tissue



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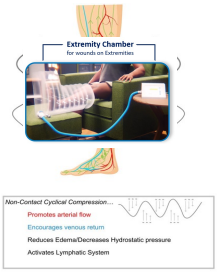
CPTO Therapy has Three Component Mechanisms

#2 – BENEFITS OF CYCLICAL COMPRESSION

TWO2 therapy utilizes an inflatable chamber, applying non-contact cyclical compression to the limb. The gentle cycling of compression between 10 mb and 50 mb pressure (up to 40 mmHg) 2 times per minute
Reduces of edema which reduces resistance to blood flow mobilizing flow and lymphatic return. This enhances oxygen diffusion and neovascularization within the wound.

The higher positive pressure more effectively delivers oxygen into the wound bed, encouraging granulation from the base.



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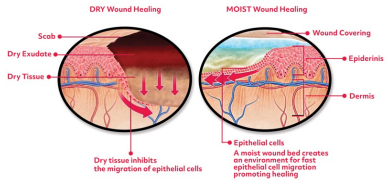
CPTO Therapy has Three Component Mechanisms

#3 – BENEFITS OF HUMIDIFICATION | **Assures an ideal wound healing environment, promoting healthy granulation tissues for faster, more effective and durable healing.**

Dry vs. Moist Wound Healing



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How to Utilize

Applied by the Patient at home
- 90 minutes a day
- 5 days a week
- Overlying Gas Permeable Dressing

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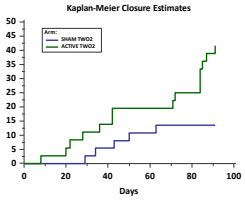
A Multinational Multicenter, Randomized, Double-Blinded Placebo-Controlled Trial to Evaluate the Efficacy of Cyclical Topical Wound Oxygen Therapy (TWO_2) in the Treatment of Chronic Diabetic Foot Ulcers: The TWO_2 Study

Robert G. Frykberg, Peter J. Franks, Michael Edmonds, Jonathan N. Brantley, Luc Teot, Thomas Wild, Matthew G. Garoufalis, Aliza M. Lee, Janette A. Thompson, Gerard Reach, Cyaandi R. Dove, Karim Lachgar, Dirk Grotemeyer,and Sophie C. Renton, on behalf of the TWO2 Study Group

Cox proportional hazards modeling, after adjustment for UTC grade, demonstrated **>4.5 times the likelihood to heal DFUs over 12 weeks** compared with the sham arm with a **hazard ratio of 4.66** (97.8% CI 1.36, 15.98), **P=0.004**



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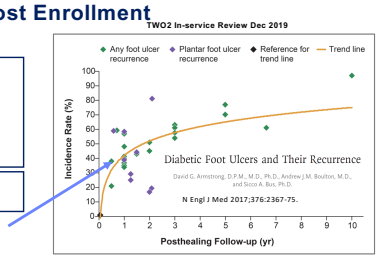
Durability of Healing
12 Months Post Enrollment

SIX-FOLD REDUCTION IN RECURRENCE
Active arm = 6.7%
Sham arm = 40%

P = 0.070



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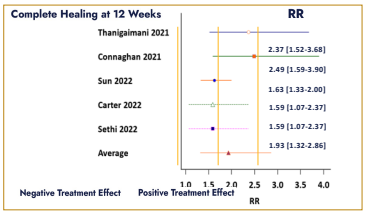
Systematic Reviews & Meta-Analyses

All 5 confirm that DFUs treated with SOC + TOT are 2X more likely to heal than SOC alone



Patient Identification:
Meta-analyses support efficacy in the defined populations: chronic DFUs of at least 4 weeks duration and not adequately responding to SOC alone

All Show Consistent Positive Complete Healing Outcomes

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Technical and Clinical Outcome of Topical Wound Oxygen in Comparison to Conventional Compression Dressings in the Management of Refractory Nonhealing Venous Ulcers

Study Design:

132 refractory (>2 years Duration) VLU patients were enrolled (average was 9 years)

67 managed using CPTO

65 managed with conventional compression dressings

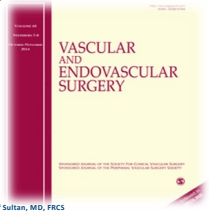
End points:

Proportion of ulcers healed at 12 weeks

Reduction in ulcer size

Time to full healing

Reoccurrence rates up to 36 months



Wael A. Tawfick, MRCSI, and Sherif Sultan, MD, FRCS
Vascular and Endovascular Surgery 2013 Jan;47(1):30-7. doi: 10.1177/1538574412467684. Epub 2012 Dec 5.

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Results

At 12 weeks 76% of the CPTO managed ulcers had completely healed, compared to 46% of the CCD-managed ulcers (P < .0001)

Mean reduction in ulcer surface area at 12 weeks was 96% in patients managed with CPTO and 61% in patients managed with CCD (P < .0001)

After 36 months follow-up, 47% of the CCD healed ulcers showed recurrence compared to only 6% of the CPTO healed ulcers (P < .0001)

MRSA elimination occurred 46% patients managed with CPTO and 0% patients managed with CCD (<.001)

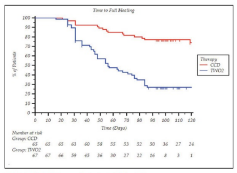

Figure 3. Time to full healing. Kaplan Meier curve showing time to full ulcer healing. The TWO2-managed ulcers had a significantly shorter median time to full healing (57days) compared to 197 days in CCD-r (P<.0001).

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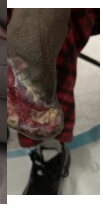
How do I use TWO2 Therapy

No Option Revascul
Pre and Post Deep
Resistant Wounds a



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Conclusions

- Topical Oxygen Therapy combined with Cyclical Compression and Humidification provide a new option for poorly healing arterial and venous wounds
- This had lead to an improvement in:
- Arterial and venous ulcer healing rates and complete ulcer healing
- Decreased ulcer recurrence rates
- **Decreased level of hospitalization for infected diabetic foot wound venous ulcers**
- Decrease rates of amputation

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Thank You

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