

Impact of Continuous Topical Oxygen Therapy on Wound Moisture Levels

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Introduction

Continuous Topical Oxygen Therapy (cTOT) is becoming increasingly recognized as a valuable adjunct to good standard of care in non-healing chronic wounds.¹ Compelling evidence supporting the impact of cTOT on wound progression, healing and pain management is reported in primary research²⁻⁴ and in various recent meta-analysis.⁵⁻⁷

As part of wound bed preparation, moisture balance of the wound bed is important in wound healing.^{8,9} An *ex vivo* porcine wound model was used to assess the impact of oxygen flow during application of continuous Topical Oxygen Therapy (cTOT) on the moisture levels at the wound bed.

Methods

Simulated wounds were created in decontaminated porcine skin explant. The tissue was then placed onto agar. Pre-weighed Oxygen Delivery System (ODS) were placed onto the simulated wound bed and covered with a pre-weighed semi-occlusive dressing.

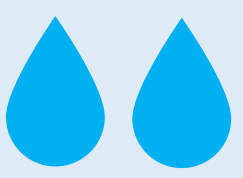
The ODS was connected to the cTOT* device with either oxygen flow of 11m l/ hr (test) or no oxygen flow (negative control). A positive control consisted of simulated wound only (no device) covered with a semi-occlusive dressing. All samples were incubated at 35°C ± 2°C at 80% humidity for 24h or 48h. Both test and control samples were assessed in triplicate (Figure 1).

Following incubation, test and control samples were removed from the incubator and ODS and dressings were removed and weighed. A skin surface hydration meter was used to assess moisture levels in the tissue.

*cTOT device tested was NATROX® O₂ Wound Therapy



Figure 1. A) cTOT device placed onto inoculated porcine skin, B) skin & cTOT device covered with 10 cm x 10 cm semi-permeable dressing



No significant difference between the negative control (device switched off) and cTOT (device switched on) following incubation for 24/ 48-hr in...

- Moisture content of the tissue incubation period
- Moisture absorption of the dressings

Data from this test confirms cTOT treatment does not reduce moisture levels in a simulated wound model

Results

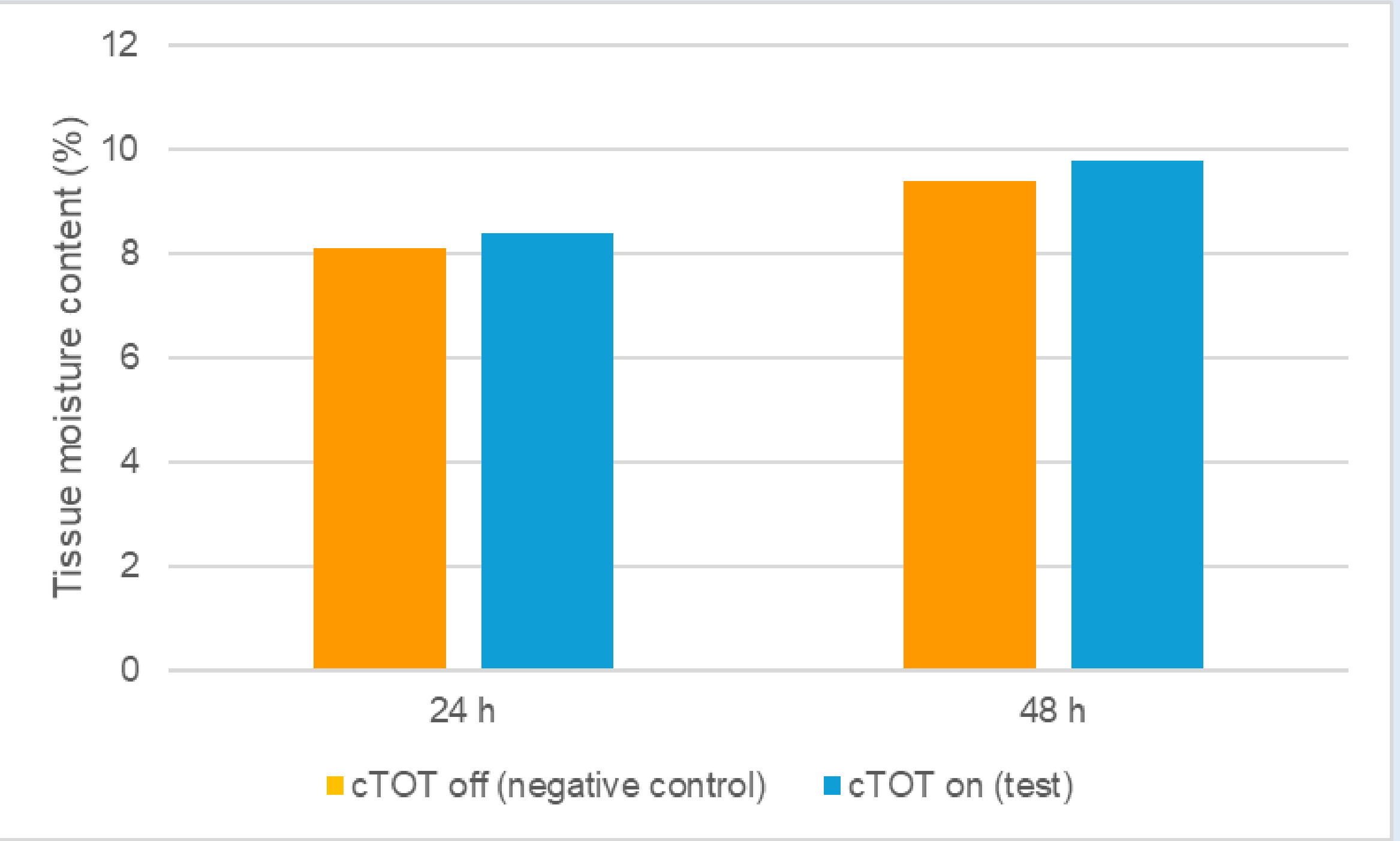


Figure 2. Porcine tissue moisture content following treatment with the cTOT device turned on (test) and the cTOT device turned off (negative control) for 24 and 48 h.

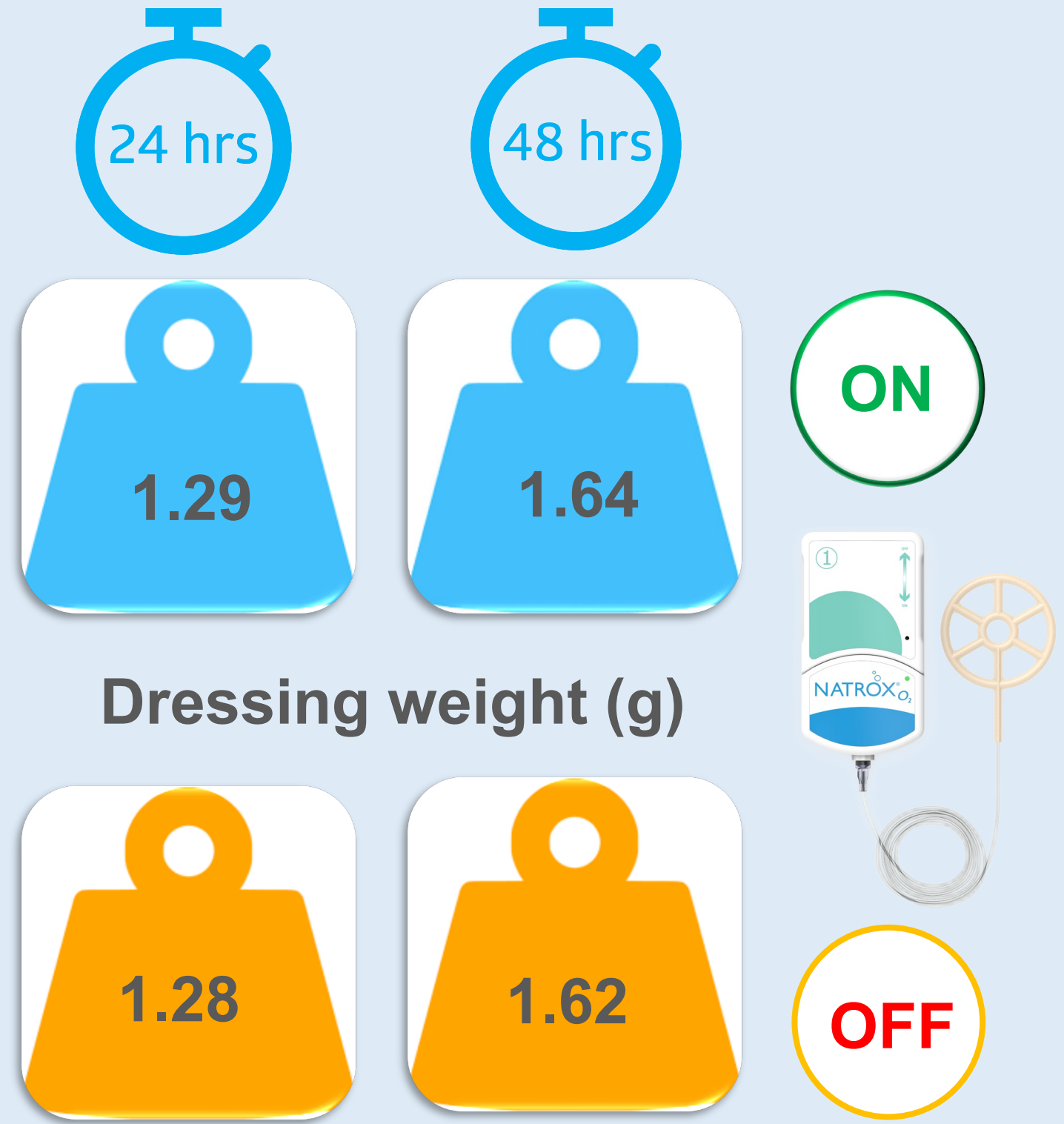


Figure 3. Weight of dressings (g) following treatment with the cTOT device turned on (test) and the cTOT device turned off (negative control) for 24 and 48 h.

Discussion

cTOT is an adjunctive therapy that supports faster healing²⁻⁷ and pain reduction⁴ in non-healing hypoxic wounds. cTOT use is endorsed and recommended by international expert guidance including the IWGDF, WHS and the ADA.¹⁰⁻¹² Moisture balance in a wound is also essential for wound healing to progress.^{8,9}

This laboratory test using an *ex vivo* model to simulate the wound environment confirms that the oxygen flow of 11ml / hr with the cTOT device does not reduce moisture levels in the wound bed.

References

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