## Limb Salvage through the use of a bioelectric, antimicrobial dressing

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### BACKGROUND

When all other methods of treatment have failed in patients presented with infected, chronic wounds, amputation is oftentimes the unfortunate answer. There was an estimated 1.7 million people with limb loss (excluding fingers and toes) in the United States in 2007, and there are more than 185,000 new amputations performed each year (1). The devastating loss of a limb results in permanent disability and adversely affects the patient’s movement, self-image, self-care and quality of life. Before surgeons turn to amputation as a last resort, it is critical that the use of a bio-electric dressing should be explored. A growing body of research has shown the benefits of the synergistic activity of electric stimulation and antimicrobial action (2-4). A novel antimicrobial bioelectric dressing* that exhibits these two mechanisms of action has been clinically observed to initiate healing in chronic wounds that had failed all other methods of treatment (5).

### METHODS

A bioelectric, antimicrobial wound dressing was evaluated as an alternative to amputation in a series of case studies at multiple study site locations. Three amputation candidates were treated with a bioelectric dressing, which was applied to the cleansed wound site and covered with a sterile semi-occlusive dressing for a period of 7 weeks to 11 months with 2.3 dressing changes per week. The wounds were observed closely for any signs of healing initiation and epithelialization.

### RESULTS

All wounds in the presented case studies healed completely. No adverse effects were reported.

### CONCLUSION

Based on the results from the presented clinical case study observations, it appears that the application of an antimicrobial, close-proximity electrically active wound dressing may be effective in facilitating healing of severe, chronic wounds and eliminating the need for amputations. Future studies are needed to determine if the bioelectric dressing is applicable other acute and chronic wound settings.

### REFERENCES

1. www.amputee-coalition.org
5. Shetler SK. The role of a bio-electric, antimicrobial dressing in the healing of acute and chronic wounds (abstrax). Clinical Symposium on Advances in Skin and Wound Care, Las Vegas, NV. October 2006 (suppl): 217.

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### Case Study 1 Osteomyelitis

**Patient Profile**

A 90 y.o. male presented with a chronic infected supralateral osteomyelitis of the right foot. Patient was scheduled for amputation.

**Co-Morbidity:**

Diabetes, hypertension, cardiacopathy, renal, and renal failure, MRSA, peripheral neuropathy.

**Wound Profile**

Co-Morbid: Diabetic. Wound had already sustained a arterial/bone perforation. Wound was treated with a bioelectric dressing and topically with a 20% nystatin ointment dressing, with dressing changes every 7 days. Negative pressure wound therapy (NPWT)™ was reapplied in combination with the bioelectric dressing to enhance patients local immune at the granulation tissue formation to prepare the wound bed for skin grafting.

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<tr>
<th>Initial</th>
<th>1 week</th>
<th>8 weeks + NPWT</th>
<th>8 weeks + Skin Graft</th>
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<td>![1 week Image]</td>
<td>![8 weeks + NPWT Image]</td>
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### Case Study 2 Recalcitrant wound

**Patient Profile**

Man presented with multiple refractory wounds on the dorsal and lateral aspects of his left foot. Patient was scheduled for amputation.

**Co-Morbidity:**

Immune-suppressed.

**Wound Profile**

Co-Morbid: Chronic ulcer with exposed tendon and bone, no pulse at wound bed. Recurrent foot infections included MRSA, interdigital (between toes) therapy (HBO2).

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<thead>
<tr>
<th>Initial</th>
<th>5 weeks</th>
<th>7 weeks</th>
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<td>![5 weeks Image]</td>
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### Case Study 3 Radiation ulcer

**Patient Profile**

A 78 y.o. female presented with a non-healing radiation ulcer on the anterior aspect of right leg for three years. They patient was a 2.5 below knee amputation and had died 60 days prior. The ulcer had failed all other treatments and was offered as an alternative.

**Co-Morbidity:**

Hyper-tension, diabetes.

**Wound Profile**

Co-Morbid: Failed NPWT, HBO2. Healing skin was repaired after 60 days of skin grafting.

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<thead>
<tr>
<th>Initial</th>
<th>4 months</th>
<th>11 months</th>
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