JumpStart® Antimicrobial Wound Dressings

Product Features

JumpStart dressings are provided on an ultra-thin, lightweight, polyester substrate and contain laser-cut fenestrations to allow easy passage of wound exudate into the absorbent layer or a secondary dressing. The flexible design easily contours to the body. JumpStart dressings may be applied directly over sutures, staples, Steri-Strip™ wound closure strips, and liquid skin adhesives. The dot matrix pattern of embedded microcell batteries generates microcurrents on the dressing surface in the presence of a conductive medium, such as sterile saline, water-based gel, or wound exudate.

JumpStart Wound Dressings

JumpStart Contact-Layer Dressing
- JumpStart antimicrobial wound contact-layer powered by V.Dox™ technology
- Polyester substrate with embedded microcell batteries made of elemental silver and elemental zinc
- Fenestrations allow wound drainage to pass through dressing to absorbent layer

JumpStart Composite Dressing
1. JumpStart antimicrobial wound contact-layer powered by V.Dox technology
2. Polyester substrate with embedded microcell batteries made of elemental silver and elemental zinc
3. Fenestrations allow wound drainage to pass through dressing to absorbent layer
Energel® Wound Hydrogel Features

Use Energel wound hydrogel to activate the JumpStart® microcell batteries:
- Sterile, water-soluble gel formulated to maintain a moist wound environment and provide moisture to a dry wound
- Double-packaged sterile for use in the operating room
- Optimally sized for single use (7.5 g)
- Maintains JumpStart dressing’s conductivity for up to 7 days

A New Generation in Wound Care Solutions

Inspired by the body.
The skin naturally creates and uses electrical energy to promote healing. Electric fields in the skin create surface energy potential, known as transepithelial potential (TEP). When skin is wounded, a change in electric potential occurs, which drives the cell migration and wound healing processes.

Powered by electricity.
JumpStart® antimicrobial wound dressings—powered by patented V.Dox technology—employ moisture-activated microcell batteries that wirelessly generate microcurrents designed to mimic the skin’s electrical energy.

Energized by results.
JumpStart dressings reduce the risk of infection by killing a broad spectrum of bacteria without antibiotics while supporting the body’s natural healing process.
Published studies show JumpStart® dressings reduce the risk of infection1-5 and promote the healing process6 to optimize outcomes.

Reduce the risk of infection
■ Killed a broad spectrum of pathogens, including multidrug-resistant and biofilm-forming bacteria1-3
■ Disrupted existing biofilm infection and prevented biofilm from forming in preclinical studies4
■ Prevented bacterial growth, with sustained antimicrobial impact for up to 7 days5
■ Demonstrated electricidal antimicrobial impact vs silver dressings2

Promote healing
■ Improved re-epithelialization with JumpStart dressings vs standard dressings6

Live/dead fluorescence staining demonstrated bacterial killing of P aeruginosa within JumpStart antimicrobial wound dressing compared to a standard silver-based dressing at 24 hours. Green = alive, Red = dead

In a prospective case series,6 skin graft harvest sites (N = 13) demonstrated significantly greater re-epithelialization with JumpStart dressing (71.8%) vs control (46.9%) (P = .015).

Publications Summary

Clinical and Preclinical Publications

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Wound biofilm infection</td>
<td>Tested ability of wireless electroceutical device (WED) to manage bacterial biofilm infection in vivo in porcine chronic wound biofilm infection model inoculated with Pseudomonas aeruginosa and Acinetobacter baumannii</td>
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<tr>
<td>Design</td>
<td>Preclinical porcine mechanistic study</td>
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<tr>
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<td>Electroceutical wound dressing used in combination with human acellular dermal matrix in three complex cases (conventional care was unable to close wounds in up to 2 years)</td>
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<tbody>
<tr>
<td>Total knee arthroplasty</td>
<td>Ninety-two patients underwent 100 total knee arthroplasties performed by the same surgeon and were treated with novel microcurrent-generating antimicrobial dressings</td>
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<tr>
<td>Design</td>
<td>Single-center retrospective case series</td>
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JumpStart Antimicrobial Wound Dressings

### Study Area
Wireless electrical device in conjunction with negative-pressure wound therapy


- Thirty chronic wound patients undergoing negative-pressure wound therapy (NPWT) were randomized into two arms (control = NPWT standard of care with thrice-weekly dressing changes; test = wireless electrical device [WED] with twice-weekly dressing changes)
- WED + NPWT effectively decreased required dressing change frequency from thrice to twice weekly without any negative impact on wound healing
- Cost of care with use of WED + NPWT was significantly lower than NPWT alone (P < .05)

### Design
Randomized controlled clinical trial


- Evaluated differences in wound healing outcomes when treated with microcurrent-generating wound care device (MCD, n = 18) vs standard of care (SOC, n = 20)
- Study population of rehabilitation and long-term care patients with acute and chronic wounds of varied etiology
- MCD group wounds healed significantly faster (19.78 days) than SOC group wounds (36.25 days) (P = .036)
- 83.3% of MCD group wounds healed monotonically vs 50% of SOC group wounds (P = .018)

### Study Area
Acute and chronic wounds


- Compared acute wound healing after skin grafting (n = 13)
- Half of each graft donor site was covered with a standard dressing (control) and half with a bioelectric dressing (test); both were covered with a semi-occlusive dressing
- One week post-op: significantly greater epithelialization with bioelectric dressing (71.8%) vs control (46.9%) (P = .015)
- Blinded evaluator rated bioelectric dressing side visually superior in 92.3% of wounds

### Design
Prospective single-center clinical study


- Evaluated effectiveness of the silver-zinc bioelectric dressing as compared with skin preparation with 2% chlorhexidine or 4% chlorhexidine in reducing bacterial count on the knee
- Three groups of 48 healthy volunteers were included (age range, 23-54 years); 60% male
- Application of the silver-zinc bioelectric dressing was equally effective at reducing skin bacterial load when compared with skin preparation with 2% chlorhexidine or 4% chlorhexidine in healthy volunteers
- Study findings indicate that use of a bioelectric dressing after knee surgery can match the standard of care of preparing the skin with an antiseptic before surgery

### Scientific Publications

**Study Area**
Anti-biofilm properties


- Tested the ability of a wireless electroceutical device (WED) to inhibit *Pseudomonas aeruginosa* biofilm
- WED impaired biofilm formation and significantly impaired extracellular polymeric substance formation compared to two different controls (placebo dressing and silver dressing) (P < .05)
- WED impaired biofilm structures and caused significant cell death compared to controls (P < .05)
- Silver alone was unable to disrupt *P aeruginosa* biofilm

**Study Area**
Anti-biofilm properties


- Tested a bioelectric dressing’s effectiveness against 10 clinical wound pathogens in monospecies and multispecies biofilm settings
- Bioelectric dressing was effective against monospecies and multispecies biofilm-forming bacteria; demonstrated 100- to 1000-fold reductions in bacterial numbers compared to three controls
Study Area
Re-epithelialization

- Human keratinocytes exposed to bioelectric dressing (BED) demonstrated significantly accelerated cell migration. This effect was not observed with three controls (placebo, silver alone, zinc alone)
- Cells exposed to BED’s electric fields demonstrated increased signaling and production of H$_2$O$_2$ (required for cell migration)

Design
In vitro

Study Area
Antibacterial properties

- Examined in vitro antibacterial efficacy of bioelectric dressing against 13 wound pathogens
- The bioelectric dressing demonstrated bactericidal activity against antibiotic-sensitive multidrug-resistant strains and multiple antibiotic-resistant strains of wound pathogens, and bacteriostatic activity against *Enterococcus* species

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**Single-Layer Dressing Application**

1. **Moisten** dotted side of dressing with sterile saline, water, or water-based hydrogel.
2. **Apply**, dots down, onto wound surface.
3. **Cover** with secondary dressing(s) appropriate for drainage levels.

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**Deep-Wound Dressing Application**

1. **Hydrate** dotted side of dressing with sterile saline, water, or water-based hydrogel.
   **Note**: If desired, trim to size and shape prior to moistening (include 1 cm to 2 cm overlap of wound edge).
2. **Apply**, dots down, onto wound surface.
   **Note**: Completely line deep wound and extend 1 cm to 2 cm beyond wound edges.
Fill "dead space" with gauze.

Note: If desired, moisten gauze to keep JumpStart® moist.

Knee Dressing Application

1. Orient the dressing to anatomy.
2. Remove center liner and moisten pad.
3. Apply, dots down, onto wound surface, with knee in slight flexion (~30°).
4. Remove both shin liners and secure to skin.
5. Remove both thigh liners, overlap, and secure to skin.

Composite Dressing Application

1. Remove center liner and moisten dotted pad with sterile saline, water, or water-based hydrogel.
2. Apply, dots down, onto wound surface.
3. Remove remaining liners and smooth adhesive over skin.

Note: If dressing a joint, apply while joint is in slight flexion.
### Address All Your Wound Dressing Needs

#### JumpStart® Composite Dressing Types

<table>
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<tr>
<th>Product Image</th>
<th>Product Description</th>
<th>Item Number</th>
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<tbody>
<tr>
<td>Foot, Ankle, and Shoulder Dressing</td>
<td>Foot, Ankle, and Shoulder Dressing</td>
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<td>Direct Anterior Hip Arthroplasty Dressing</td>
<td>Direct Anterior Hip Arthroplasty Dressing</td>
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<td>Hip and Knee Arthroplasty Dressing</td>
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<td>Partial- and Full-Thickness Dressing</td>
<td>Partial- and Full-Thickness Dressing</td>
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<td>Total Shoulder Arthroplasty Dressing</td>
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<td>4-Inch Diameter Scope-Site Dressing</td>
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#### JumpStart Contact-Layer Dressing Sizes

![Contact-Layer Dressing Sizes Image]
Post-Application Care and Dressing Changes

- JumpStart® dressing may be left in place for up to 7 days
- Earlier and/or more frequent dressing changes may be required, depending on the amount of exudate present and the condition of the wound and/or the surrounding skin. Inspect the wound site periodically
- To remove JumpStart dressing, gently pull back. If it adheres to the wound surface, do not force it off; moisten or soak the dressing with sterile saline or water until it can be removed without tissue disruption

JumpStart wound dressings with V.Dox™ technology are versatile and usable as an adjunct to multiple advanced wound care therapies such as:

- Directly over sutures, Steri-Strip bandages, staples, liquid skin adhesives
- In case studies, JumpStart dressings have been used with bioengineered skin substitutes and negative-pressure wound therapy\(^1\,^2\)
- With multilayered compression therapy

Ordering Information

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To order, please call (800) 934-4404. Contact your local Arthrex Technology Consultant for additional information.
References


5. Vomaris Wound Care, Inc., Data on file. Report #SLM090512CMC01F.
