JumpStart antimicrobial wound dressing is an advanced microcurrent-generating dressing used for the management of wounds and surgical incision sites. Microcell batteries made of elemental silver and zinc generate an electrical current when activated by a conductive fluid, such as saline, hydrogel, or wound exudate. These microcell batteries create microcurrents to support the body’s natural electrical healing process and provide antimicrobial protection to assist with wound healing. JumpStart antimicrobial wound dressing has demonstrated broad spectrum bactericidal activity against antibiotic-resistant strains of wound isolates within 24 hours.1

**Antibacterial Properties**


- Previous literature has shown that wound healing is “enhanced in the presence of an external electrical field.”
- JumpStart dressing is capable of generating a direct current voltage from 0.5 V - 0.9 V.
- JumpStart dressing demonstrated antibacterial efficacy against 28 various antibiotic-sensitive, Gram-positive, and Gram-negative bacteria, including *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*.
- Significant reduction in mono- and polymicrobial biofilm species.

**Takeaway**

The unique technology of JumpStart dressing facilitates antibacterial efficacy and biofilm disruption to enhance wound healing capabilities.

**Antibacterial efficacy testing of a bioelectric wound dressing against clinical wound pathogens.** *Open Microbiol J.* 2014;8:15-21. doi:10.2174/1874285801408010015

- 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.
- The large-scale use of silver dressings has been “associated with an antimicrobial resistance to silver.”

**Takeaway**

In vitro, the advanced microbattery technology of JumpStart dressing provides protection against a broad spectrum of bacteria.
Anti-biofilm Properties


- Evaluated antibiofilm properties of JumpStart® antimicrobial wound dressing against 10 clinical wound pathogens in monospecies (biofilm formed from a single bacterial strain) and multispecies (biofilm formed of more than one bacterial strain) settings.
- The bioelectric dressing was effective against mono- and multispecies biofilm-forming bacteria, demonstrating 100- to 1000-fold reductions in bacterial numbers compared to 3 different controls.

**Takeaway**

JumpStart dressing demonstrates significant disruption of mono- and multispecies biofilms.


- Tested ability of wireless electroceutical devices (WED) to manage bacterial biofilm infection in vivo in a porcine chronic wound biofilm infection model inoculated with *Pseudomonas aeruginosa* and *Acinetobacter baumannii*.
- WED disrupted existing biofilm infection and prevented biofilm from forming.
- WED repressed genes responsible for quorum sensing, disrupting bacteria’s ability to communicate and form biofilm.

**Takeaway**

Bioelectric dressings are an effective method for disrupting and preventing biofilm formation.


- A bacterial biofilm model was used to test a bioelectric wound dressing’s ability to inhibit *Pseudomonas aeruginosa* biofilm over a 24-hour period.
- The bioelectric wound dressing impaired biofilm structural integrity, markedly disrupting bacterial biofilm structures and causing significant cell death in comparison to controls.
- Silver alone was unable to disrupt the biofilm.

**Takeaway**

The use of bioelectric dressing can be advantageous for wound closure, improving re-epithelization and disrupting biofilm formation.
**Re-epithelialization**


- JumpStart® wound dressing significantly accelerated keratinocyte cell migration. This effect was not observed with placebo, silver alone, or zinc alone.
- JumpStart wound dressing increased signaling and production of $\text{H}_2\text{O}_2$, triggering cell signaling pathways to influence intracellular activity and accelerate cell migration.
- JumpStart wound dressing energized mitochondria in keratinocytes with a greater than twofold enhancement of basal glucose uptake after treatment compared to placebo.

**Takeaway**

The technology of JumpStart dressing proved effective in increasing keratinocyte migration to promote re-epithelialization.

**Blount AL, Foster S, Rapp DA, Wilcox R**


- "At week 1 postprocedure, average epithelialization of 71.8% was noted on the bioelectric dressing-treated side, compared with 46.9% on the SOD side, representing an average 34.62% faster wound healing (P=.015)."
- Patients rated bioelectric dressing superior in terms of scar color, stiffness, thickness, and overall quality.

**Takeaway**

Patients treated with the bioelectric dressing healed faster and had improved appearance, in addition to reporting subjective satisfaction.

**Acute and Chronic Wounds**


- Retrospective, dual-center review of wound healing outcomes found that microcurrent-generating dressing reduced healing times for postoperative wounds by 34% and open wounds by 45%.
- The average time from initial measurement to wound closure for microcurrent-generating dressing patients was 19.78 days (SD=14.45), compared to 36.25 days (SD=28.89) for the standard of care patients.
- The mean percent wound volume per day for the microcurrent-generating dressing patients was -9.82% versus -3.83 for standard of care patients.

**Takeaway**

JumpStart dressing can help promote decreased postoperative wound-healing time.

- Systematic review of 13 studies published between 2009 and 2019 where wounds were treated with an electroceutical device (ECD). Nine studies included dressings embedded with zinc and silver particles to generate electricity.

- In vitro laboratory studies found that the “electrical current of ECDs can kill bacteria, disrupt biofilm, and encourage re-epithelialization and healing.”

- ECDs demonstrated exceptional results to standard of care wound therapies for hard-to-heal wounds and patients who had unsuccessful treatments showed remarkable improvements.

- Studies evaluating acute wounds noted that ECDs demonstrated a reduction in treatment cost and resource use, which is largely a result of the associated increased healing rate, shorter length of stay, lower number of dressing changes, and reduced staff required to manage wound care.

**Takeaway**

JumpStart® dressing is a cost-effective product that disrupts biofilm, kills bacteria, and encourages healing.

**Cost-Effectiveness**


- Single-institution chart review of 92 patients who underwent total knee arthroplasty, from the same surgeon, and were treated with a microcurrent-generating antimicrobial dressing.

- Found no major complications, prosthetic joint infections (PJI), or major infectious complications.

- Microcurrent dressing use led to a reduced need for dressing changes and nursing time, lightening the burden on clinical personnel.

- Postoperative treatment with microcurrent dressing is approximately $50, which is significantly less than the cost to treat one PJI that may be between $50,000 and $100,000.

**Takeaway**

JumpStart antibacterial dressing is a low-cost investment in infection prevention that may decrease length of patient stay and treatment burden on facility personnel.
Preoperative Use of JumpStart Dressing


- Study included 20 patients scheduled to undergo elective shoulder arthroplasty or arthroscopic shoulder surgery. JumpStart® dressing was placed over the area of the planned surgical incision. Cultures and biopsies were obtained at time of surgery.
- Culture results showed significantly reduced C. acnes skin burden at the time of surgery compared to baseline measurements (p=0.004).
- JumpStart dressing is a safe and simple preoperative intervention that may aid in reducing perioperative infections.

**Takeaway**

JumpStart dressing demonstrated efficacy in reducing the C. acnes burden preoperatively.


- Three groups of 48 patients were treated with either 2% chlorhexidine, 4% chlorhexidine, or JumpStart dressing prior to knee surgery.
- Skin cultures taken 24 hours after application that all three were effective in decreasing epidermal bacterial load compared to the control contralateral limb.

**Takeaway**

The use of JumpStart dressing after knee surgery can match the standard of care preparation methods, and could be advantageous in special clinical scenarios such as postoperative bleeding that causes a dilution of a chemical antiseptic.

**Reference**