

Experience a transformation  
in wound care.

  
**Mirragen**  
a bioactive glass matrix

# Reimagine Healing with Mirragen's Bioactive Glass Technology

Mirragen<sup>®</sup>, a borate-based bioactive glass fiber matrix...



## Facilitates quality tissue formation

- Granulation: supports blood vessels and collagen for strong, resilient tissue.
- Re-epithelialization: supports new epithelial tissue, which restores the protective barrier and reduces the risk of infection.



## Without the traditional risk of infection tissue-based products have

- In an RCT the Mirragen group experienced no adverse events related to infection of the index ulcer.
- The SOC group, a collagen alginate, had a 25% infection rate.<sup>6</sup>

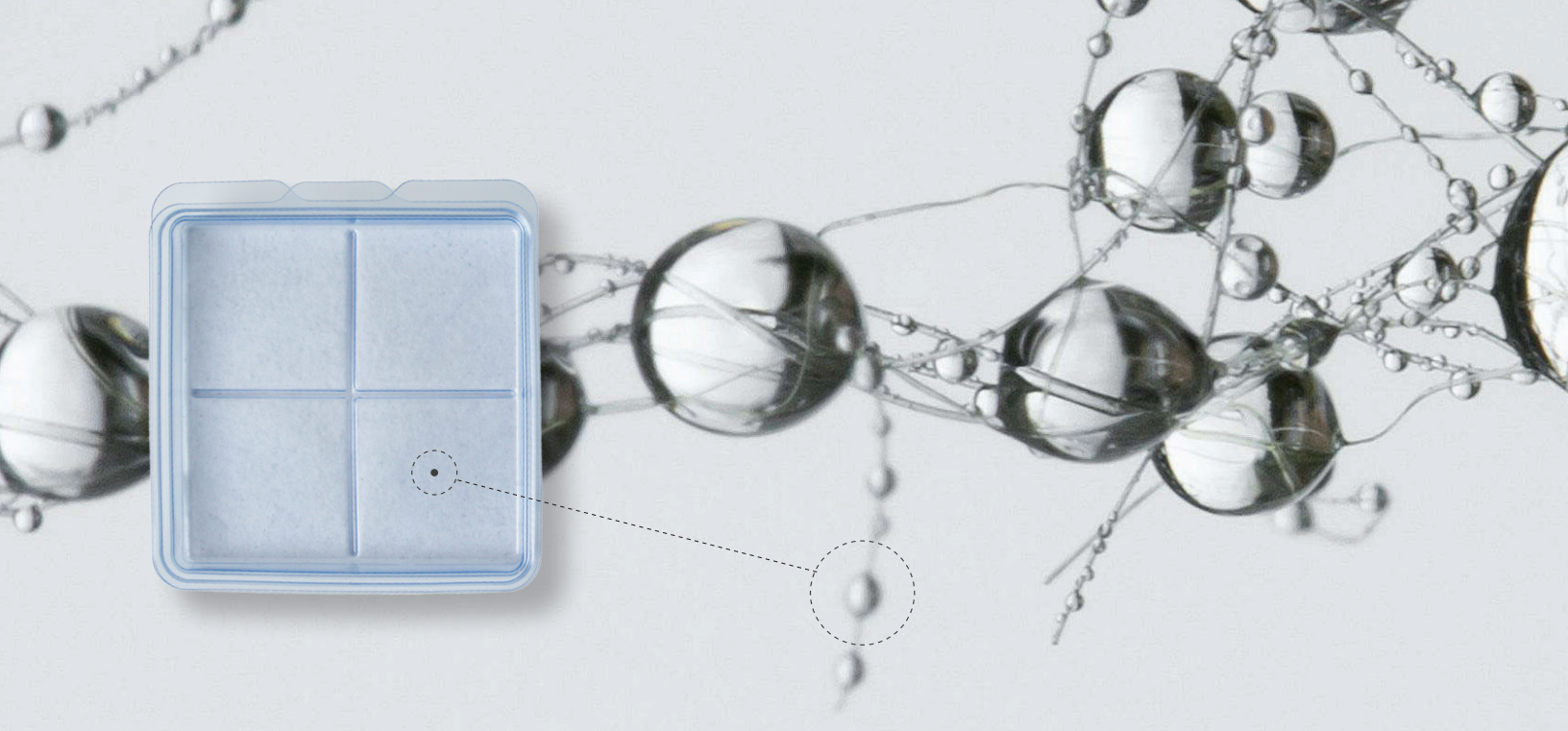


## All in an easy to use, versatile form factor

- Adaptable to all wound shapes – no need for preparation or thawing.
- Stays in place even in deeper or tunneling wounds.
- Stored at room temperature for up to five years.

## What is bioactive glass?

- Bioactive glass is a synthetic, inorganic, biodegradable material.
- Composed of elements naturally found in the body, like boron and calcium.
- Proven use in orthopedics, spine, and dentistry for over 30 years.<sup>14</sup>



## **Mirragen® is indicated for use with a variety of wound etiologies<sup>13</sup>**

**Partial and full-thickness wounds**

**Diabetic ulcers**

**Venous ulcers**

**Chronic vascular ulcers**

**Pressure ulcers**

**Surgical wounds**

Donor sites/grafts, post-Mohs surgery, podiatric, post-laser, wound dehiscence

**Trauma wounds**

Abrasions, lacerations, first- and second-degree burns, skin tears

**Tunneled/undermined wounds**

**Draining wounds**



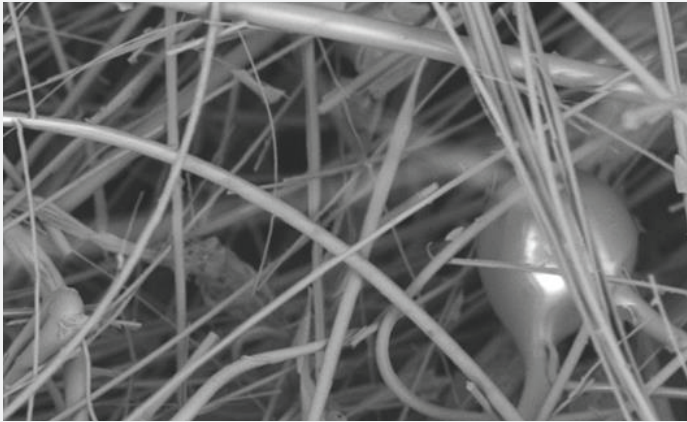
# Mechanisms of Action

## Scaffold Effect of Mirragen

The fiber matrix provides a physical structure – similar to a fibrin clot after hemostasis – **for native cells to live, thrive and rebuild tissue.**

Those native cells include:

- Endothelial cells that build blood vessels for proper vascularization<sup>4</sup>
- Fibroblasts that deposit collagen to form granulation tissue<sup>2</sup>
- Keratinocytes that rebuild the epithelium<sup>3</sup>



The scaffold's fibers dissolve over 1-2 weeks, creating space for native collagen deposition and blood vessel formation that are essential for granulation tissue.<sup>1</sup>



The scaffold's microspheres can persist up to 3 weeks or longer, continuing to create a sustainable environment conducive to wound healing.<sup>1</sup>

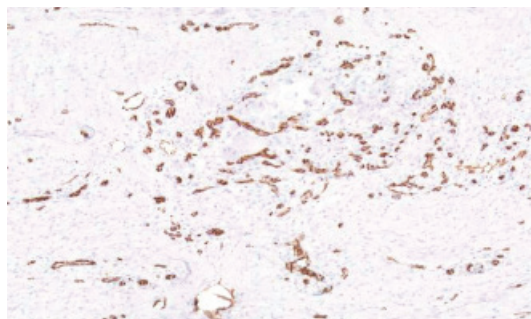


# Environmental Effect of Mirragen

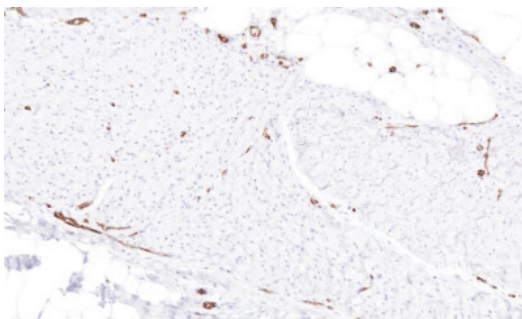
Mirragen facilitates a wound healing environment conducive to **angiogenesis**:

- As part of the healing process, the body forms new blood vessels (angiogenesis) through a complex process that includes the secretion of pro-angiogenic factors like VEGF, which facilitates increased migration and proliferation of endothelial cells.<sup>5</sup>

Mirragen



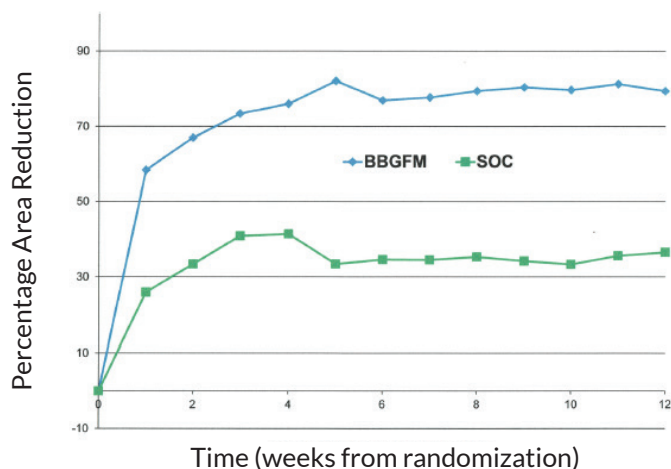
Control



Histology showing blood vessel density at 6 weeks in swine study.

In a swine study, treatment with Mirragen was associated with increased new blood vessel growth compared to control (no treatment).\*

In an RCT, investigators concluded that angiogenesis in the Mirragen-treated group was “probably rapid because wound area reduction on average is high over the first week”.<sup>6</sup>



Weekly percentage wound area reduction by treatment group (From Armstrong et al. 2021, Figure 4).

## Clinical Evidence

### Multicenter Randomized Controlled Trial<sup>6</sup>

RCT compared diabetic ulcers treated with Mirragen® or standard of care (SOC). After 2 weeks of screening, patients were randomized for 12 weeks of treatment.

#### 0 infections

SOC had 25% of patients experience infection-related complications, Mirragen had 0 infections of the index ulcer

#### 70% vs. 25% closed

70% of wounds were closed at 12 weeks with Mirragen vs. 25% closed with SOC

#### 79% vs. 37% PAR

Mean wound percent area reduction (PAR) at 12 weeks in the Mirragen group was 79% vs. 37% for SOC

### Lower risk of infection relative to tissue-based products

#### Pathogen Interaction with Collagen-Based Products:

Many gram-positive pathogens found in diabetic foot ulcers, such as *Staphylococcus aureus*, *Enterococcus faecalis*, and *Streptococcus equi*, can bind to collagen using collagen-binding adhesins.<sup>9,11,12</sup>

#### Sources and Vulnerability of Collagen:

Collagen can be extracted from various sources such as porcine, bovine, avian, and piscine tissues. Despite its useful properties, crude natural collagen can be easily colonized and degraded by bacteria and fungi.<sup>10</sup>

## Case Studies

### Pre-Tibial Chronic Wound - 2 Applications

Martin Johnson, MD; Pomona CA

76-year-old, female

#### History

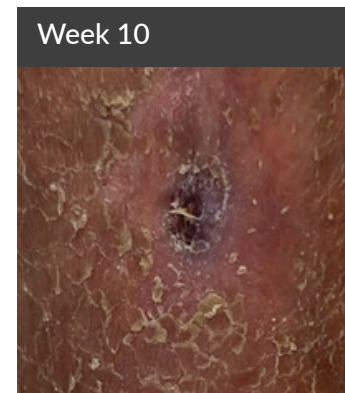
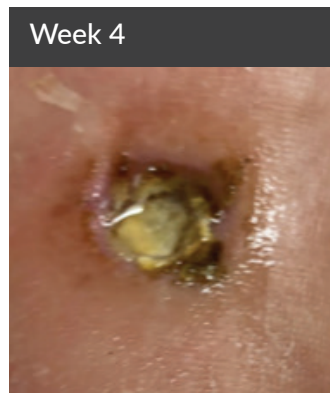
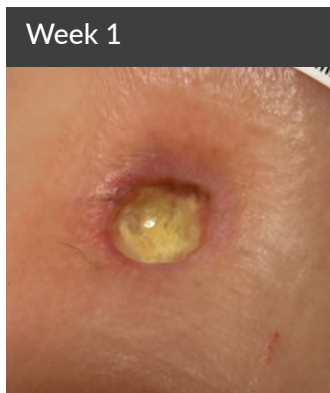
- 2-years plus exposed tibia
- Negative X-ray
- History of hypertension

#### Previous Treatments

- Folk medicine remedies

#### Outcome

- Wound closed



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### Critical Limb Ischemia Fasciotomy Wound - 3 Applications

Donald W. Buck II, MD, FACS; St. Louis, MO

60-year-old, male

#### History

- 2 pack/day smoker
- Chronic Limb Ischemia
- DVT
- Stalled fasciotomy wound

#### Previous Treatments

- Angioplasty & stents
- Fasciotomies
- Anticoagulation
- Stalled NPWT
- Incision and drainage

#### Outcome

- Wound Closed



## Case Studies

### Hematoma and Skin Necrosis - 7 Applications

Donald W. Buck II, MD, FACS; St. Louis, MO

84-year-old, female

#### History

- Diabetes
- Carotid occlusion
- Multiple strokes
- Carotid Artery Stenosis
- Chronic renal failure

#### Previous Treatments

- Anticoagulation
- Stalled NPWT

#### Outcome

- Wound closed



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### Dehisced Transmetatarsal Amputation (TMA)- 4 Applications

Martin Johnson, MD; Pomona, CA

95-year-old, female

#### History

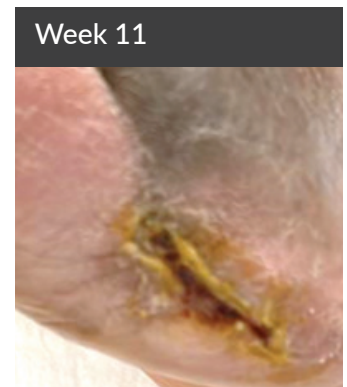
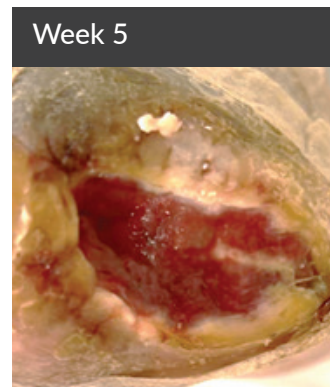
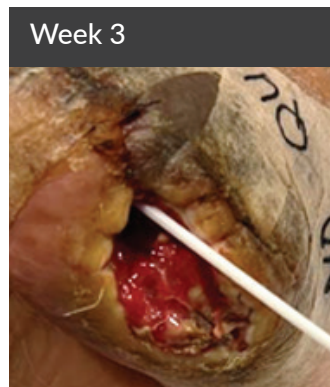
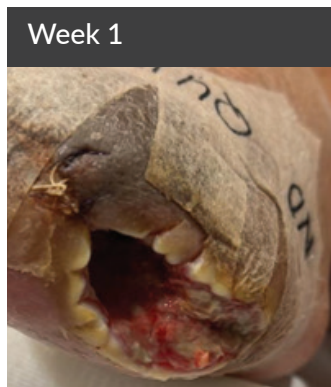
- Diabetes
- Anemia
- Wound dehiscence
- Hypertension
- Hyperlipidemia

#### Previous Treatments

- Wound cleanser
- Moist wound dressings

#### Outcome

- Wound closed





# Pyoderma Gangrenosum for 25 years - 4-8 Applications

Donald W. Buck II, MD, FACS; St. Louis, MO

50-year-old, female

## History

- 25 year wounds

## Previous Treatments

- Multiple advanced wound care products
- Collagen products
- Biologic skin substitutes

## Outcome

- Mirragen applied weekly
- Wounds healed over a period 9 weeks

Wound 1, Week 1



Wound 2, Week 1



Wound 3, Week 1



Wound 4, Week 1



Week 5



Week 9



Week 9



Week 7



# Mirragen Product Sizes

Mirragen® is supplied sterile in a two-piece disposable thermoformed tray that is sealed in a foil pouch. It is available in a variety of sizes, shapes and packaging.

Size (Metric)	Product No.	Units/Box	Size (Metric)	Product No.	Units/Box
1.5 x 1.5 cm	MWM-015-015EA	1	1.5 x 1.5 cm	MWM-015-015BX	10
2.5 x 2.5 cm	MWM-025-025EA	1	2.5 x 2.5 cm	MWM-0101SB	10
3.5 x 3.5 cm	MWM-035-035EA	1	3.5 x 3.5 cm	MWM-035-035BX	10
4.5 x 4.5 cm	MWM-045-045EA	1	4.5 x 4.5 cm	MWM-045-045BX	10



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\*Data on file.



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Mirragen Advanced Wound Matrix is intended for use in the management of wounds under the supervision of a healthcare professional. Consult the IFU for a complete list of indications and safety information.