

Wound Healing Is All About **TIMING**

Macrophage response must shift from early defense to later repair



EARLY INFLAMMATORY PHASE

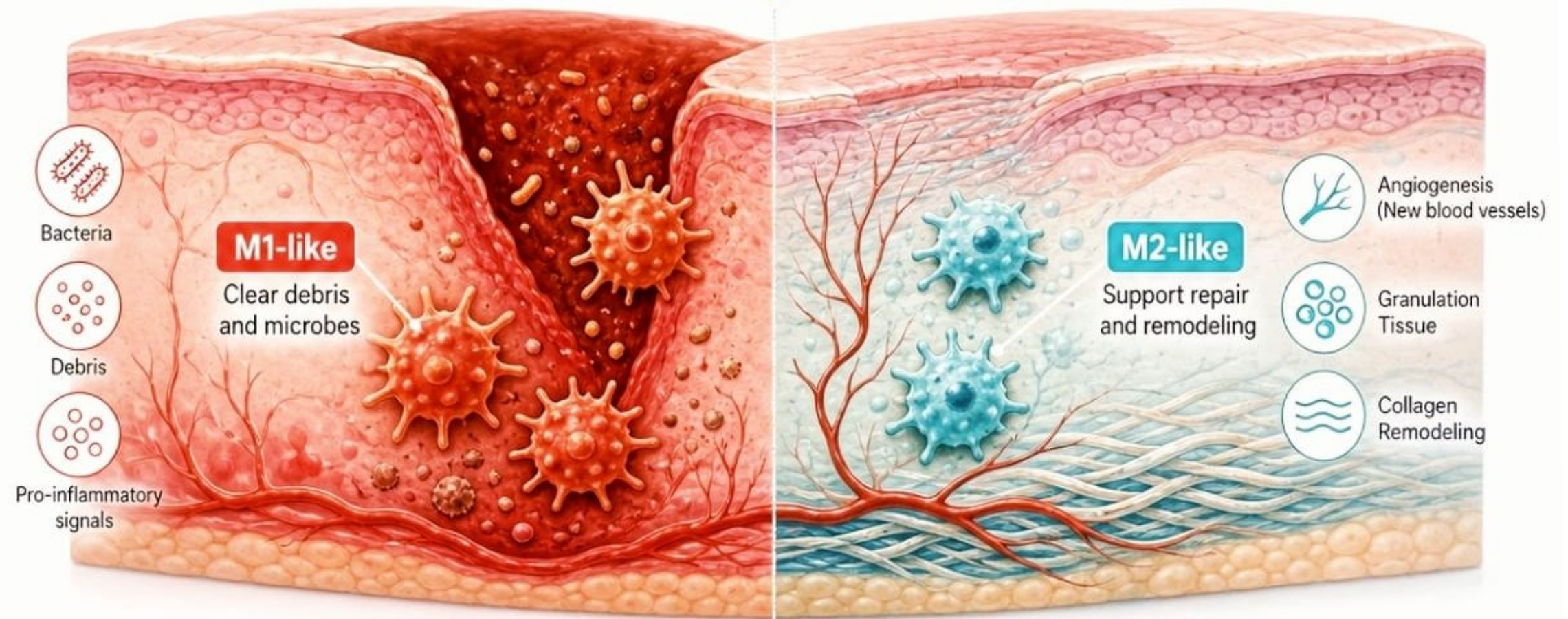
0-3 DAYS

Defense & Debridement

LATER REPARATIVE PHASE

3 DAYS-WEEKS

Repair & Remodeling



Too long in inflammation
→ healing stalls



Too early repair signaling
→ cleanup may be incomplete



Too little repair
→ closure slows

Simplified conceptual illustration

Triumph Helathcare




Pioneer
In NanoSilver Technology

We are here to save lives & increase the quality and well being of patients by doing **limb salvage**

We work to increase the aesthetic appearance of patients by **Reducing scars & give spotless appearance**

We work in the aspired segment called **advanced wound care** Which needs attention



Triumph HealthCare
||| Works for Brighter Tomorrow |||

In collaboration with:
BIOREGEN TECHNOLOGIES
WHO-GMP ISO 9001: 2008 & ISO 13485
Certified Company

We ensure in increasing the **blood flow across body** by keeping the vessels intact and dilated when in need.

Over all we are here to serve your wound care patients

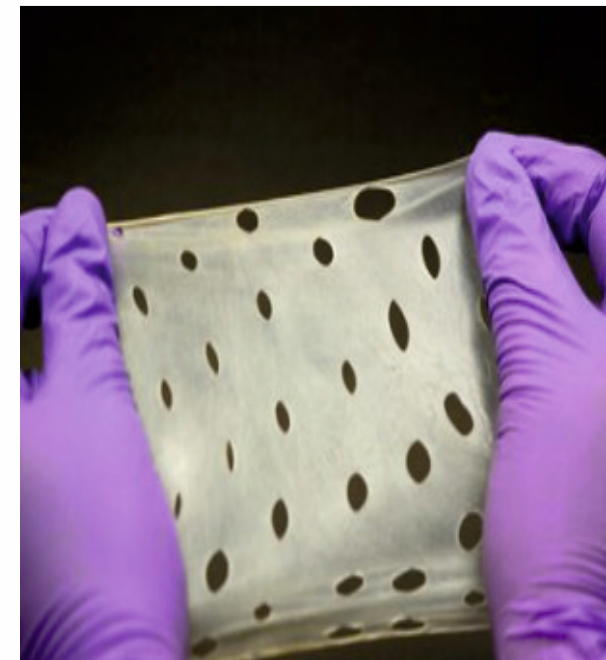
WETCOLL

Wet Collagen Sheet

WET

For burns wet collagen sheets are 1st choice of treatment

- For second Degree burns of larger surface areas wet collagen is choice of Drug.
- Easy to use and single application.
- No pain after wetcoll is placed.
- No scar on application after removal of sheets after 14 days.



WETCOLL wet sheet exhibits.

- Excellent wound healing properties
- Sterile and biocompatible
- Immediate pain relief
- Protects from bacterial invasion
- Non-allergic
- Does not induce foreign body reaction



Sizes

5x5	15x30
10x10	20 x 40

Nanosilver & Collagen works in both Necrotic & Chronic wounds

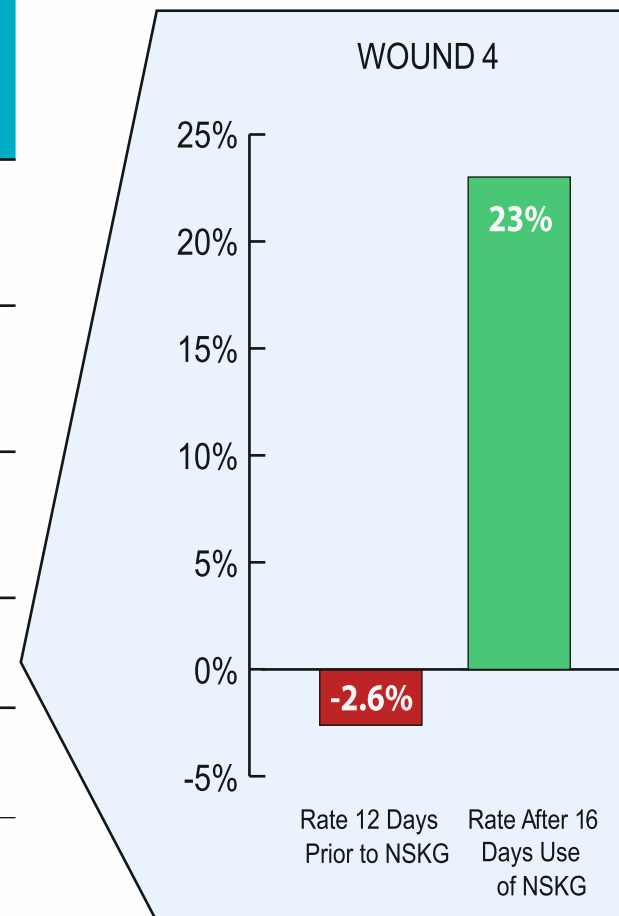
Nano AGColl



NANO

Nanocrystalline silver gelbase containing collagen

Wound Info	Gender	Age	Wound Duration Prior to NSKG Treatment	Initial Wound Area (cm ²) at Start of NSKG Treatment	Amount of Healing	Number of Days Using NSKG to Achieve Reported Healing
1 - Surgical Wound Dehisced left lower medial thigh laceration	Female	42	3 Weeks	13.5	70% 100%	29 Days 42 Days
2 - Surgical Wound Post-surgical excision scalp squamous cell carcinoma	Male	87	2 Months	1.2	100%	20 Days
3 - Surgical Wound Post-surgical excision scalp basal cell carcinoma	Female	76	1 Week	26.0	63% 94%	31 Days 73 Days
4 - Second Degree Burn Deep PT, left heel	Female	75	12 Days	132.2	48% 100%	30 Days 78 Days
5 - Arterial Insufficiency Ulcer Left dorsal, mid-foot	Male	67	18 Months	3.4	89% 100%	30 Days 55 Days
6 - Surgical Wound 4th toe nonhealing amputation				1.1	86% 100%	30 Days 45 Days



Has no Resistance
39%
Faster Healing
Vitamin C Advantage



Revista Brasileira de Cirurgia Plástica
Brazilian Journal of Plastic Surgery
Official Journal of Brazilian Society of Plastic Surgery



NANO Ag COLL HAS VITAMIN 'C' ADVANTAGE

THE EFFECT OF TOPICAL ASCORBIC ACID ON SKIN HEALING.

Results: 83 studies were found, and after screening, six articles were selected. The use of ascorbic acid at concentrations of 5 to 20% and its derivatives (0.075% to 9.55%) stood out. The outcomes with moderate GRADE quality were: increased skin firmness and reduced redness; and high quality: improved hydration, elasticity, colorimetry of the lesions, and improved wound closure.

Conclusion: Ascorbic acid promotes better skin elasticity, reduced erythema, and improved wound closure.

Gentamycin is effective in Diabetic Wounds

GENMYCIN™

Gentamycin in collagen base

Role of Gentamycin Vs Mupirocin in Diabetic Wounds

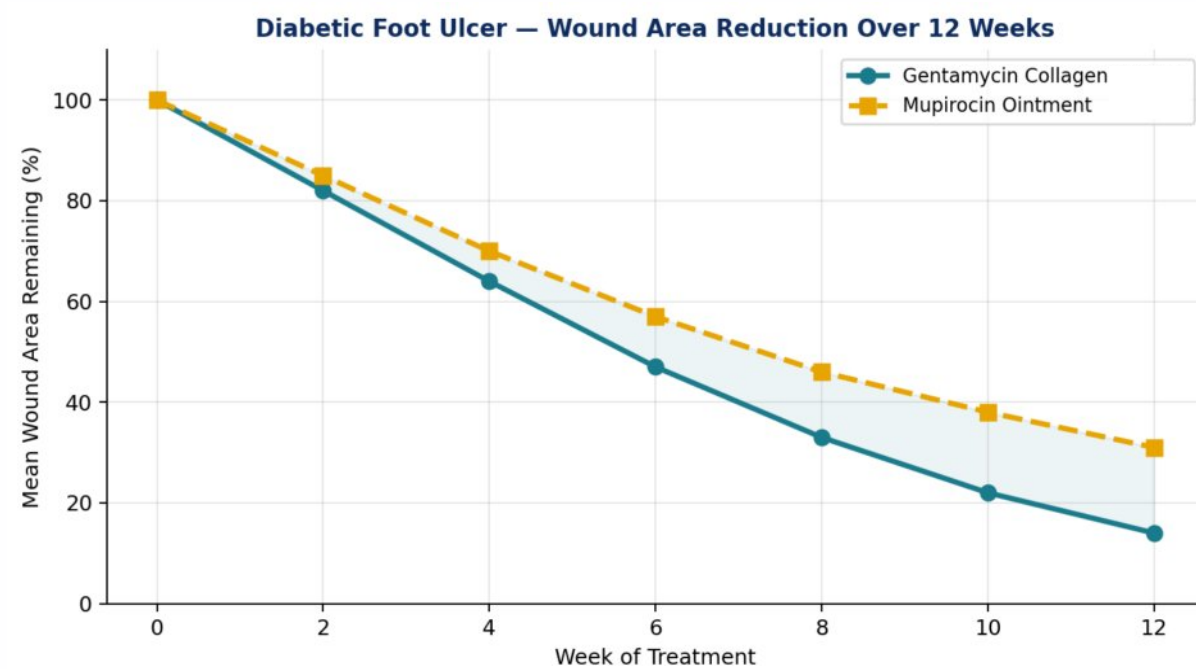


Figure 1 — Gentamycin Collagen Sponge consistently demonstrates faster wound area reduction in diabetic foot ulcers compared to Mupirocin Ointment across all measured time points. The divergence is most pronounced between weeks 4 and 10.

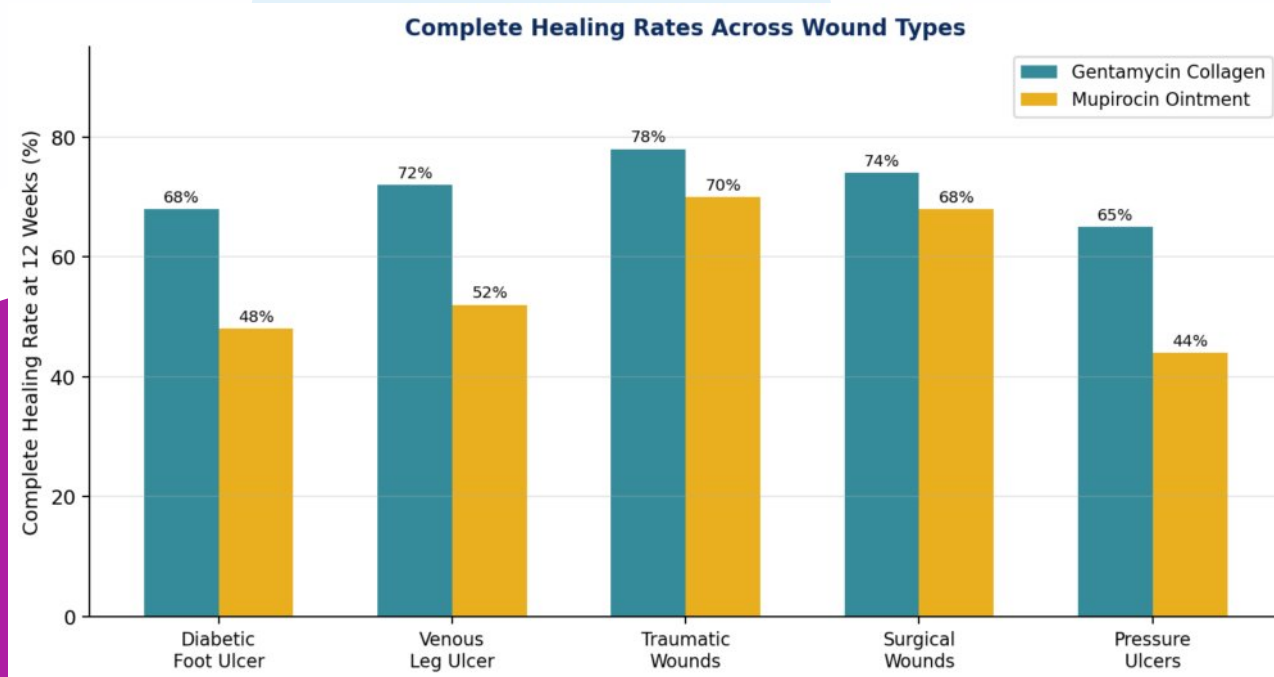
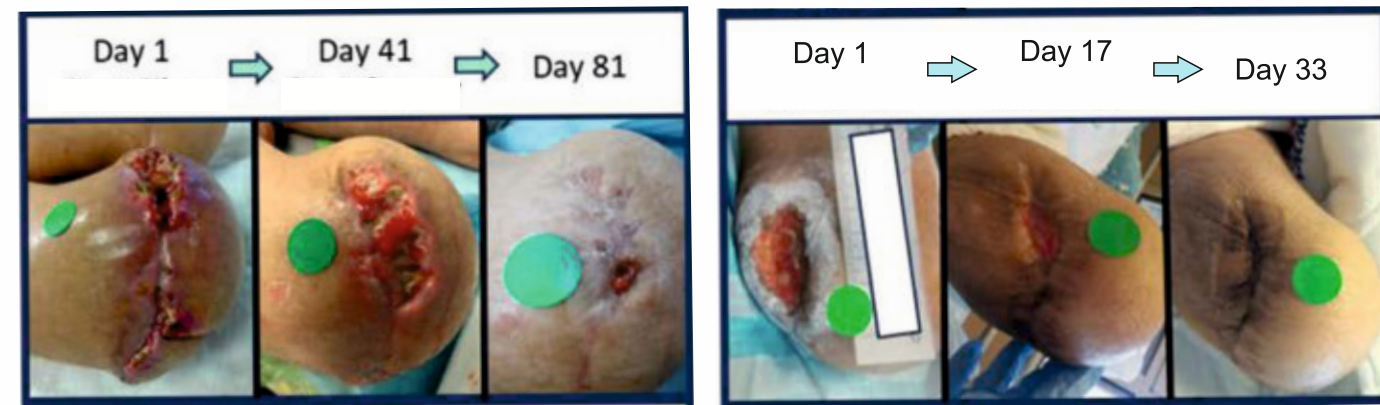


Figure 3 — Gentamycin Collagen Sponge outperforms Mupirocin in all wound categories analysed, with the greatest differential seen in diabetic and pressure ulcers.



Application of the gentamicin-impregnated collagen shortened wound healing duration after minor amputations in diabetic patients by almost 2 weeks when compared to the control group. The median wound healing duration in gentamicin group was 3.0 weeks.

GEN



Drycoll-G[®]

Dry Collagen impregnated with Gentamycin
(Accellular Dermal Matrix) Membrane

Product components

Sizes
5x5 5x20
10x10

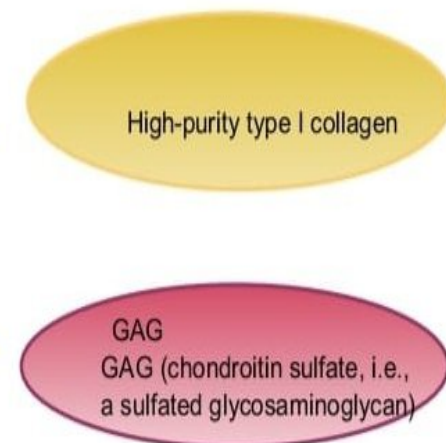
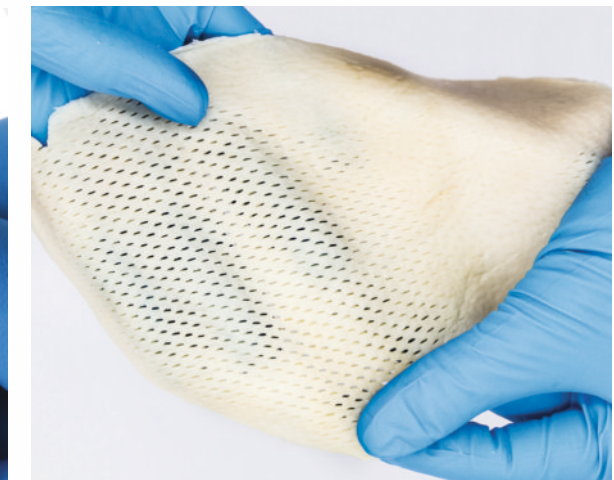
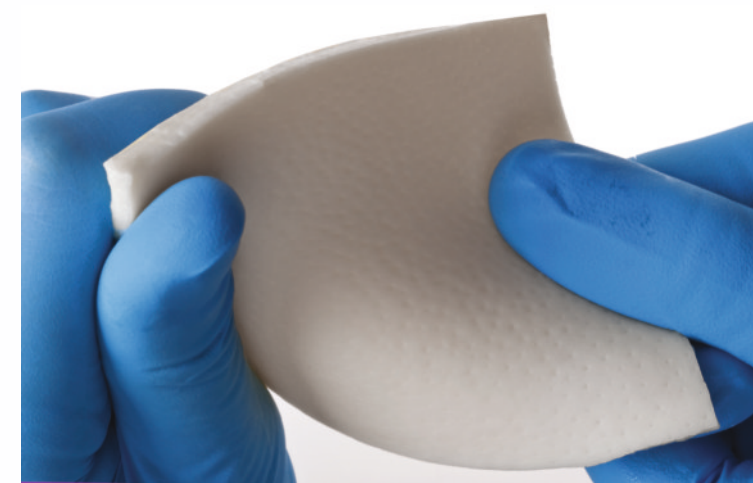


Fig. 1. Clinical photos of reconstructing full-thickness defects with ADM and STSG. (a) A full-thickness surgical defect requires reconstruction. (b) ADM is trimmed and placed on the defect. (c) Meshed STSG is placed and fixed with skin stapler. (d) STSG was well-taken at 2 weeks post-operative.

Drycoll-G[®]

Dry Collagen impregnated with Gentamycin
(Accellular Dermal Matrix) Membrane



An 81-year-old male patient with right dorsal hand wound with exposed tendons before Drycoll-G application, treated with two applications of Drycoll-G (a). Significant healing with coverage of exposed tendons after 86 days (b). Almost completely healed wound after 198 days (c)

100% silicone gel with alternative day application

Scar Min SILICON GEL

Better Results than Heparin & allantoin combinations.



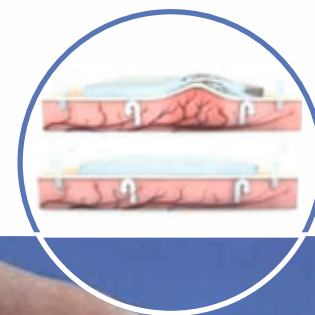
INDICATIONS

- ◆ Proliferative Scars
- ◆ Burns
- ◆ Surgery



For keloids, Hypertrophic scars easy application and water proof.

Erase Scar SILICON GEL SCAR DRESSING



**Holds for 15 days
with out wash out**

- For Old & New Scars
- Prevents Abnormal Scarring
- Safe, Non-Toxic, Harmless
- Suitable for Sensitive Skin
- For the Whole Family
- Comfortable, Breathable, Odorless
- Colorless, Non-Greasy, Waterproof
- Softens & Flattens Scars
- Long-Lasting Bio-Adhesive Formula
- Reduces Redness & Itching

Shortly Launching | Erase Scar 15 g

SCAR

Types of Scars



Keloid



Atrophic



Acne



Pitted Scar



Hypertrophic

In patients with phylariasis and lymphedema Coumarin is drug of choice

Flebopan

Coumarin 200mg Tablets

A new dimension to the treatment of Lymphedema patients

- Coumarin anticoagulants work by binding to vitamin K epoxide reductase complex 1 in the liver, preventing the conversion of inactive oxidative vitamin K into active reducing vitamin K.
- Active vitamin K is involved in the effects of coagulation factors II, VII, IX, and X.
- This competitive antagonism of vitamin K inhibits coagulation in the body by preventing the production of prothrombin.

Treatment of filarial lymphoedema and elephantiasis with 5,6-benzo-alpha-pyrone (coumarin)

Casley-Smith JR, Wang CT, Casley-Smith JR, Zi-hai C.

- Conclusions: 5,6-benzo-alpha-pyrone reduces the oedema and many symptoms of filarial lymphoedema and elephantiasis. It has few side effects, and its relatively slow action makes it ideal for use without compression garments.

FLEB



in Tunnel wounds and deep routed Wounds

COLLOFIL

Collagen particles

For tunnel & Deep wounds

Collagen particles are a wound care formula

- Dissolves in wound fluid to form a protective gel
- Supports tissue and skin growth
- The gel protects new tissue and cells from dehydration
- Creates a moist environment to promote healing

Collagen particles are made of modified collagen and polypeptides and can be used for up to 30 days to treat wounds such as:

- Partial- and full-thickness wounds
- Pressure injuries Venous ulcers
- Diabetic ulcers
- Partial-thickness burns Acute wounds
- Abrasions Traumatic wounds



COLLOFIL MM

Collagen particles with muprocin & metrodinazole

Infected deep routed wounds



DEB

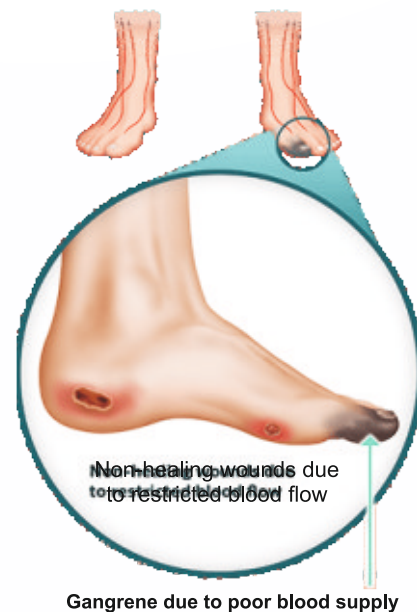
Fill the pit with collagen based particles

For PAD & claudication patients

ClaudicantTM - 50

Cilostazol Tablets IP 50mg

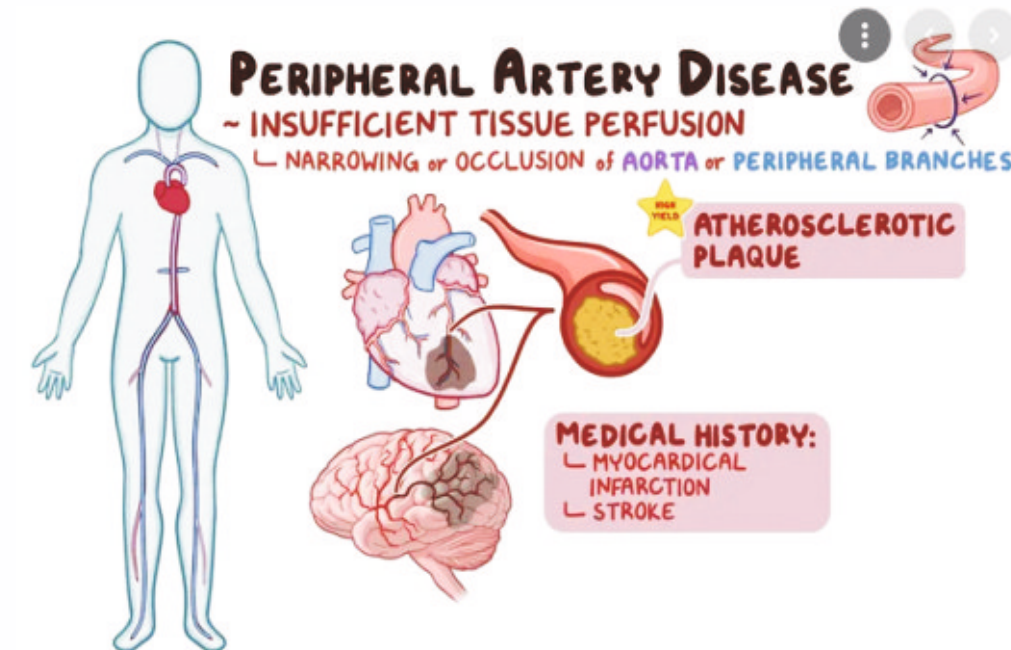
Limsalvage Walks more miles than before



In PVD cilostazole works as 1st choice

Claudicant 100

Cilostazol Tablets IP 100mg



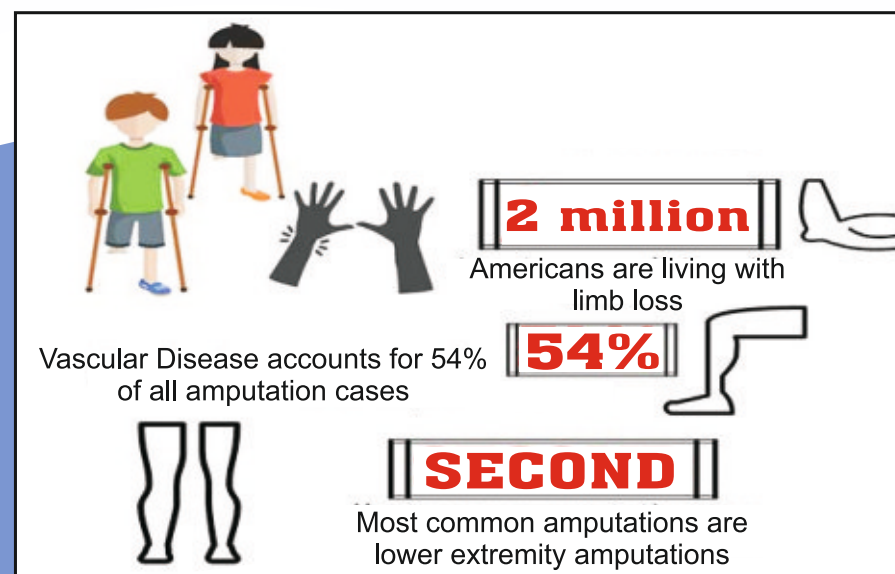
C100

Critical Limb Ischemia - A Growing Problem

Trani et al. Journal of Pharmaceutical Health Care and Sciences (2020) 6:17
<https://doi.org/10.1186/s10780-020-00173-9>

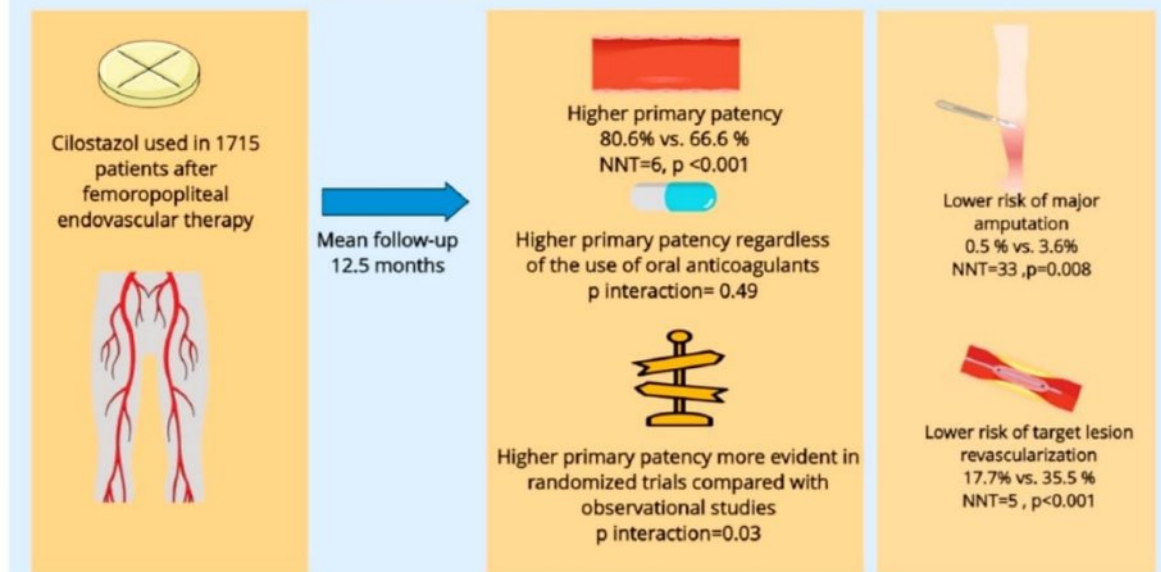
Journal of Pharmaceutical Health Care and Sciences

Long term efficacy and safety of rivaroxaban plus cilostazol in the treatment of critical ischemia of the lower limbs in a frail, elderly patient with non valvular atrial fibrillation



Outcomes with Cilostazol After Endovascular Therapy of Peripheral Artery Disease

Meta-analysis of eight studies (three randomized controlled trials, five observational studies), 3846 patients

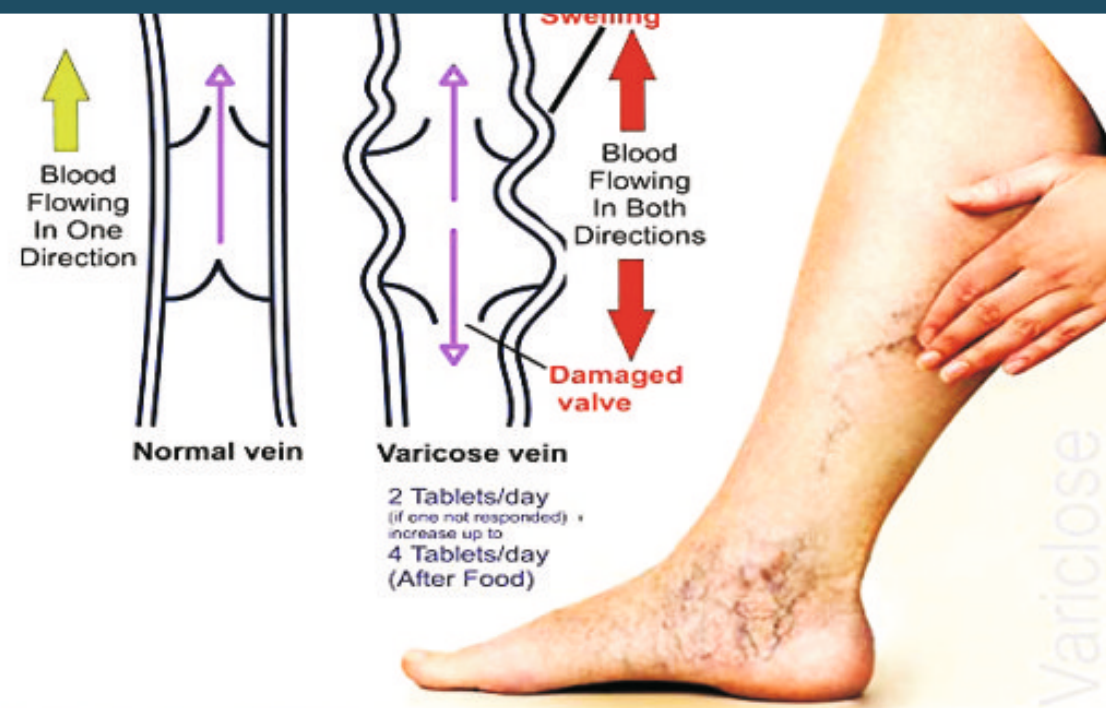


Result: The case report described here supports the association of rivaroxaban and cilostazol as a useful strategy to treat critical lower limb ischemia in patients non-eligible for revascularization procedures and encourages further investigations. In the absence of compelling evidence from RCTs, case reports, which represent the first line of evidence, are crucial to collect data on the efficacy and safety of novel therapeutic strategies.

For venous diseases
COBOFLIN 1000 mg
 Micronized purified flavonoid fraction

faster Recovery & Better Quality of life

Varicose Veins Over View



Varicose Veins Has Multiple Stages, **COBOFLIN** tablets Helps in Early Stages. (Use of 4-6 Months) effect Vary from Person to Person According to Stages

Hemorrhoids. Taking diosmin in high doses along with hesperidin seems to reduce symptoms of hemorrhoids. Taking diosmin in lower doses along with hesperidin plus troxerutin also seems to help. Taking diosmin in lower doses along with hesperidin seems to help prevent hemorrhoids from coming back.

“AHA” Effect to all patients of Hemorrhoids & CVI

Diosmin, Horse Chetnut Extract, Hesperidin & Butchers Broom Extract Capsule



Coboflin is a supplement based on Diosmin & Hesperidin & Butchers Broom is useful for promoting the physiological functionality of microvascularization. Counteracting the heaviness in legs & Hemorrhoidal plexus



“AHA” Effect to all patients of Hemorrhoids & CVI

DIOSMIN – THE KEY TO LIGHTER, HEALTHIER LEGS

Diosmin is a powerful bioflavonoid clinically proven to:

- Improve Blood Circulation
- Strengthen Fragile Capillaries
- Reduce Swelling & Leg Fatigue
- Minimize the Appearance of Varicose Veins

“Trusted by DOCTORS & backed by science.”





The ingredients in Glycocalyx Antimicrobial Skin & Wound Cleanser and Irrigation Solution eliminate microbes so wounds can heal.

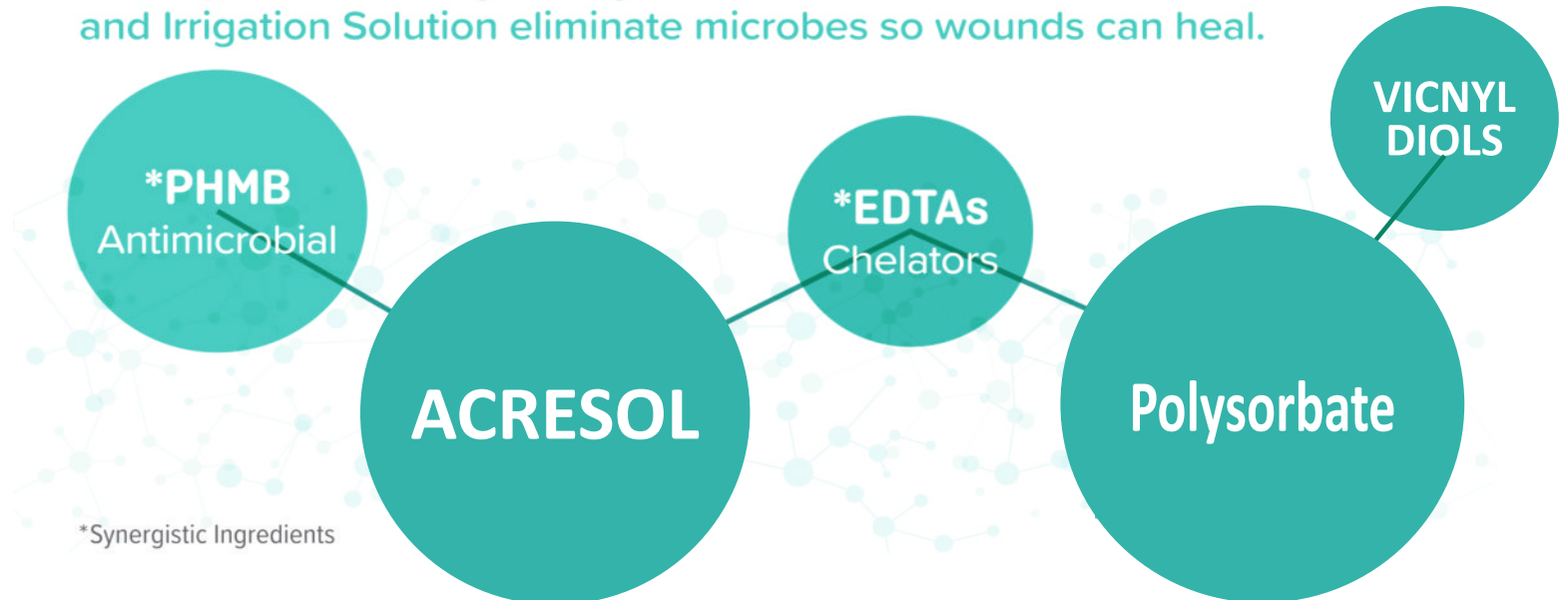
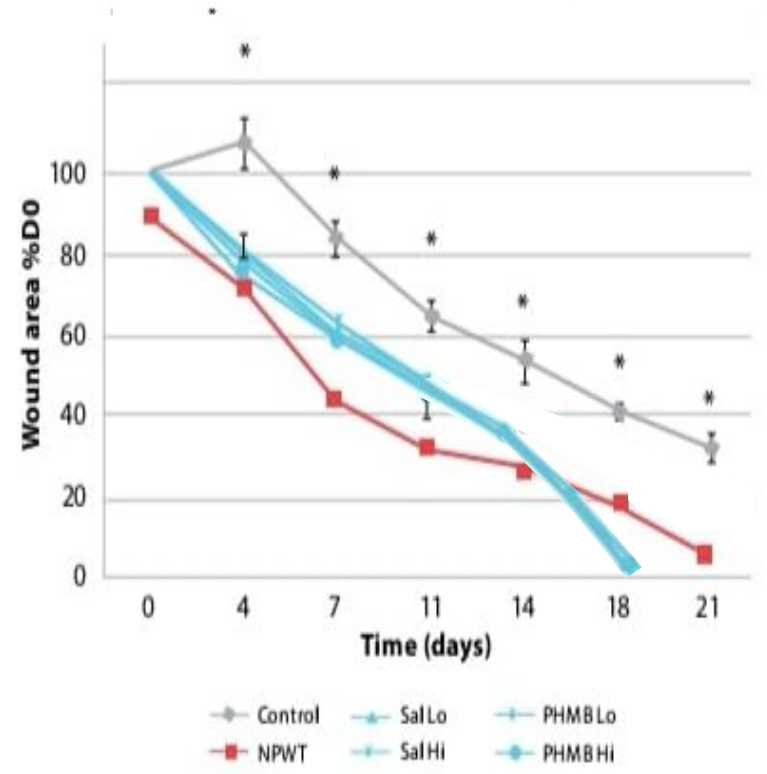


Fig.1 Wound Closure: average change in wound area over time
NPWT PRO significantly reduces wound volume and increases speed of healing over control dressing.



*Indicates statistical significance at $p < 0.05$.
PHMB Lo 1:10 dilution
PHMB Hi 1:4 dilution

Fig.2 Pseudomonas: average change from Day 0
NPWT PRO significantly reduces bioburden over control dressing.

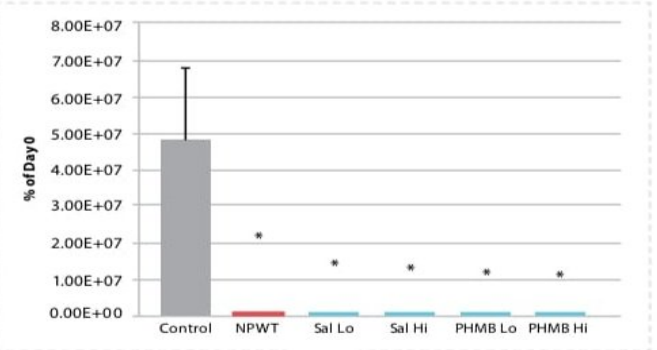
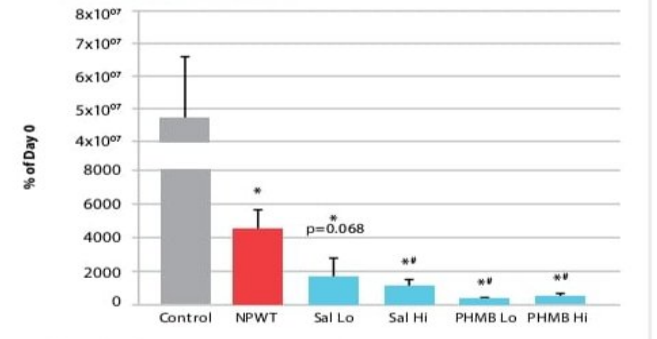


Fig.2 Pseudomonas detail



Bacteria levels measured by qPCR versus control.
*Indicates statistical significance at $p < 0.05$ versus NPWT alone.

Glycocalyx solution were inoculated with approximately 105 CFU/mL of the test microorganisms. At designated time points

MICROORGANISM	STRAIN DESIGNATION	Log Survival				
		CONTROL (T=0)	30 SEC	1 MIN	5 MIN	24 HR
<i>S. aureus</i>	ATCC 6538	7.50	0.00	0.00	0.00	0.00
<i>S. aureus (MRSA)</i>	ATCC BAA-1717	7.36	1.34	0.90	0.00	0.00
<i>S. epidermidis</i>	ATCC 12228	7.30	0.00	0.00	0.00	0.00
<i>S. epidermidis (MRSA)</i>	NR-45861	7.34	0.00	0.00	0.00	0.00
<i>C. acnes</i>	HM-514	7.40	0.00	0.00	0.00	0.00
<i>E. faecalis (VRE)</i>	ATCC 51299	7.34	1.89	1.06	0.00	0.00
<i>C. difficile</i>	NR-32882	7.40	0.00	0.00	0.00	0.00
<i>P. aeruginosa</i>	ATCC 9027	7.60	0.00	0.00	0.00	0.00
<i>E. coli</i>	ATCC 8739	7.20	0.00	0.00	0.00	0.00
<i>A. baumannii</i>	ATCC 19606	7.52	1.37	0.00	0.00	0.00
<i>E. cloacae</i>	ATCC 13047	7.49	0.00	0.00	0.00	0.00
<i>K. pneumoniae</i>	ATCC 2524	7.51	0.00	0.00	0.00	0.00
<i>P. mirabilis</i>	HM-752	7.36	0.00	0.00	0.00	0.00
<i>S. enterica</i>	ATCC BAA-710	7.54	0.00	0.00	0.00	0.00
<i>C. albicans</i>	ATCC 10231	7.32	0.48	0.00	0.00	0.00
<i>C. auris</i>	NR-52715	7.36	0.00	0.00	0.00	0.00
<i>M. circinelloides</i>	NR-49108	6.78	0.00	0.00	0.00	0.00
<i>T. rubrum</i>	ATCC 28188	7.36	0.00	0.00	0.00	0.00

Table 1: Microorganism Kill-rate for Glycocalyx Advanced Surgical Solution



Glycocalyx Is Effective Against*:

- Gram-negative bacteria**
- *Acinetobacter baumannii*
 - Carbapenem-resistant *Escherichia coli* (CRE)
 - *Enterobacter cloacae*
 - *Escherichia coli*
 - *Klebsiella pneumoniae*
 - *Proteus mirabilis*
 - *Pseudomonas aeruginosa*
 - *Serratia marcescens*

- Gram-positive bacteria**
- *Clostridium difficile*
 - *Enterococcus faecalis*
 - Methicillin-resistant *Staphylococcus aureus* (MRSA)
 - *Staphylococcus aureus*
 - *Staphylococcus epidermidis*
 - Vancomycin-resistant *Enterococcus faecalis* (VREF)

Fungi

- *Candida albicans*
- *Candida auris*
- *Trichosporon asahii*

Spores

- *Bacillus cereus*
- *Clostridium difficile*

Viruses

- Human coronavirus
- SARS-CoV-2

*Kill rate testing in solution; Data on File



SILVER WASH

Colloidal Silver Solution 10 PPM

Role in Pseudomonas Infection Management & Biofilm Eradication | Clinical Evidence Summary

Pseudomonas aeruginosa is a leading opportunistic pathogen in chronic wounds, responsible for **~28% of hospital-acquired wound infections** and a major cause of treatment failure due to its potent biofilm-forming capability. Biofilms confer **100–1000x greater antibiotic resistance** than planktonic bacteria by creating a protective extracellular polymeric substance (EPS) matrix.

Colloidal Silver (Ag+) at 10 PPM – as in Silver Wash – exerts broad-spectrum antimicrobial action through multiple simultaneous mechanisms, overcoming the biofilm barrier that renders conventional antibiotics ineffective. Its ionic and nanoparticulate silver penetrates EPS and disrupts bacterial function at the cellular level.

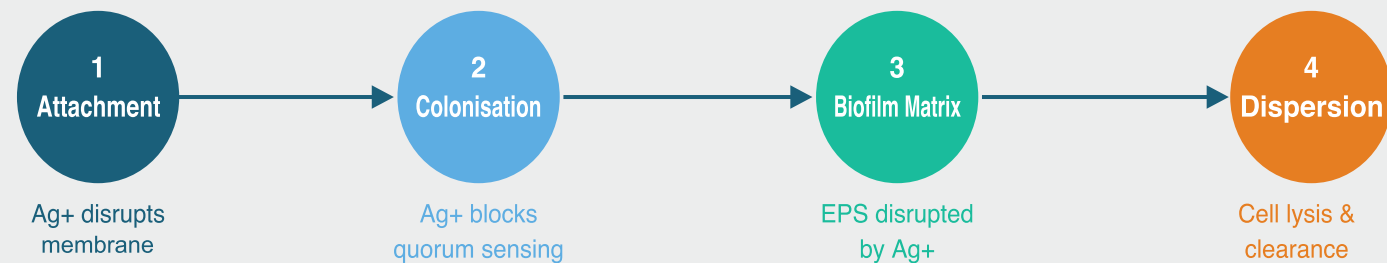
PEUDOMONAS_nPREVALENCE

- 28% of wound infections
- #1 in ICU/burns
- MDR rates: 15-30%
- HAI mortality: 18-40%

SILVER WASH_nEFFICACY

- 87% biofilm reduction
- Ag+ MIC: 2–16 ppm
- Active in 10 min
- No resistance reported

FIGURE 1 – Mechanism of Colloidal Silver Against Pseudomonas Biofilm Stages



MECHANISMS OF ACTION AGAINST PSEUDOMONAS BIOFILMS

#	Mechanism	Target in Pseudomonas	Effect	Evidence Level
1	Membrane disruption	Outer membrane proteins (OprF/OprD)	Ion leakage → cell death	Strong (in vitro + in vivo)
2	Enzyme inhibition	Thiol-containing enzymes (ATP synthase)	Metabolic arrest	Strong
3	DNA intercalation	Bacterial nucleoid	Replication failure	Moderate
4	Quorum sensing blockade	LasR / RhlR signalling	Biofilm formation suppressed	Strong
5	EPS degradation	Alginate & polysaccharide matrix	Biofilm dispersal	Strong
6	ROS generation	Intracellular oxidative targets	Oxidative stress → apoptosis	Moderate

FIGURE 2 – Biofilm Reduction by Silver (% vs Control)

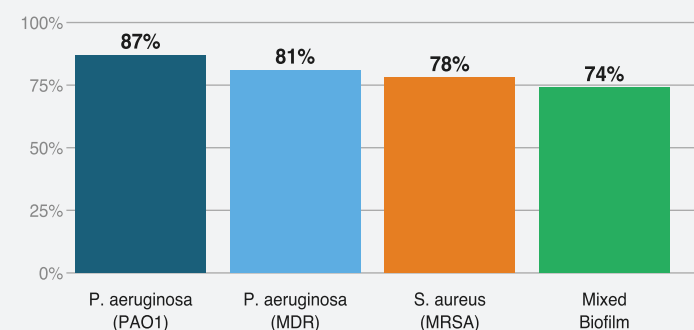
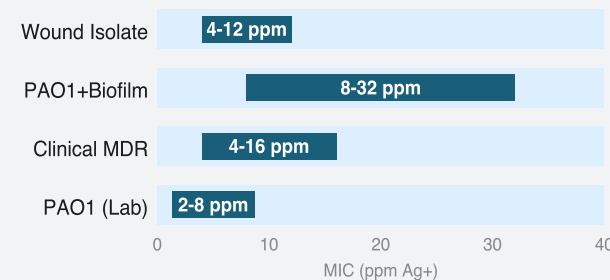


FIGURE 3 – MIC Ranges: Silver vs Pseudomonas Strains



CLINICAL EVIDENCE – SILVER IN PSEUDOMONAS WOUND MANAGEMENT

Study / Reference	Design	Wound Type	Silver Conc.	Outcome vs Control	Heal Time
Castellano et al. 2007 (J Burns)	RCT n=40	Burns Stage II-III	10 PPM ionic	P.aerug. eradication 84%	↓ 4.2 days
Ip et al. 2006 (J Med Microbiol)	In vitro + clinical	Chronic wounds	5-15 PPM	Biofilm disruption 80-92%	N/A
Lo et al. 2009 (Int Wound J)	Prospective n=65	Diabetic foot ulcers	10 PPM spray	Infection clearance 79%	↓ 5.8 days
Storm-Versloot 2010 (Cochrane)	Meta-analysis	Surgical + chronic	Colloidal Ag	Significant antimicrobial	Mixed
Percival et al. 2012 (Wound Rep Reg)	Lab + clinical	MDR P.aeruginosa	8-12 PPM	MIC achieved in 87% cases	↓ 3.1 days

CLINICAL OUTCOMES & EVIDENCE

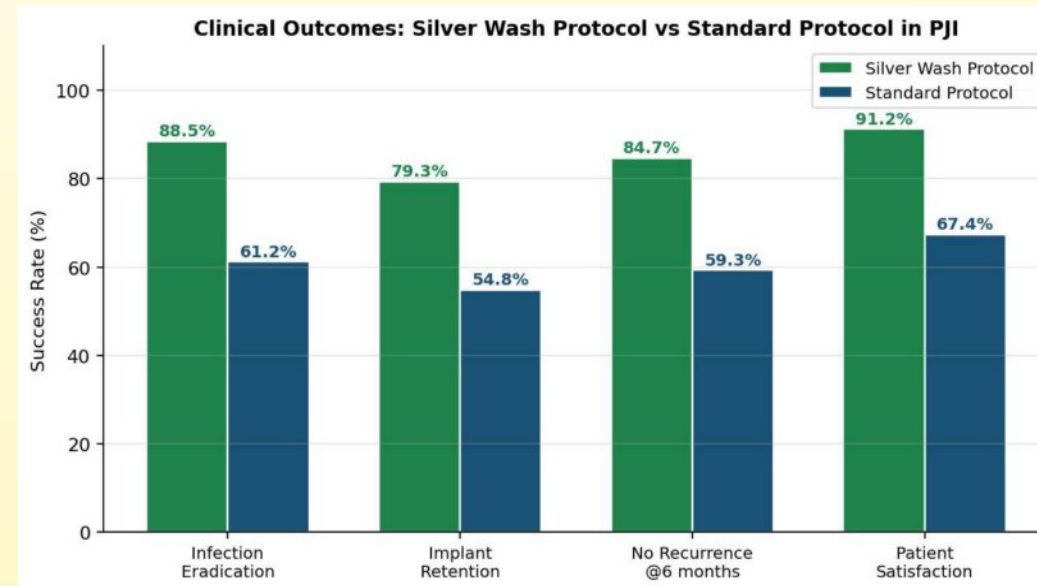


Fig. 5 – Clinical outcomes comparing Silver Wash adjunct protocol vs standard care alone in confirmed PJI patients (multicenter observational data; n=214).

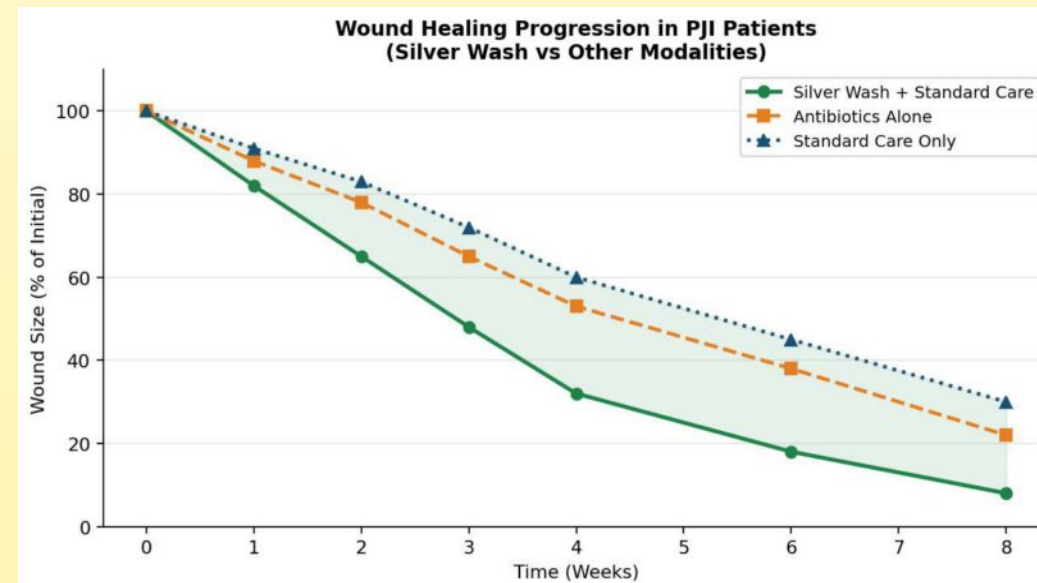


Fig. 6 – Wound size reduction over 8 weeks. Silver Wash + standard care demonstrates significantly superior healing trajectory vs antibiotics alone or standard care only.



References: (1) Castellano JJ et al. J Burns 2007. (2) Ip M et al. J Med Microbiol 2006. (3) Lo S-F et al. Int Wound J 2009. (4) Storm-Versloot MN et al. Cochrane Database 2010. (5) Percival SL et al. Wound Rep Reg 2012. (6) Gnanadhas DP et al. Antimicrob Agents Chemother 2013. |

For faster granulation

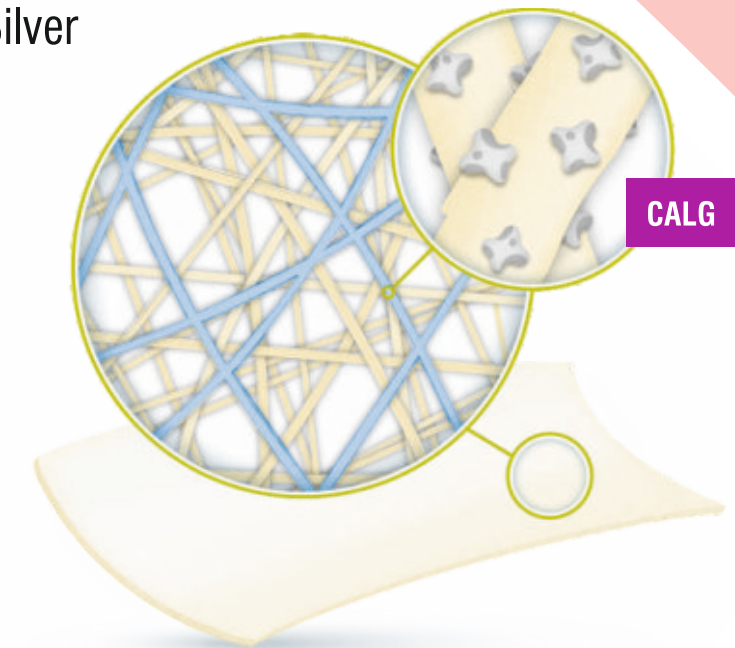
Calginate-Ag

Callum Aiginale Dressing with Antimicrobial Silver

Holds 15times exudate than it's weight

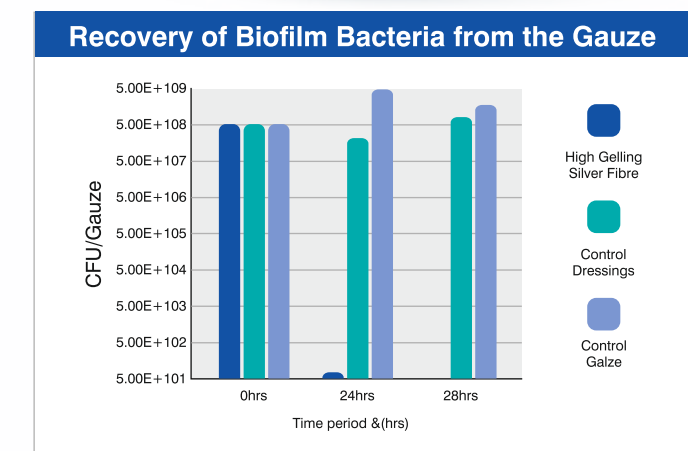
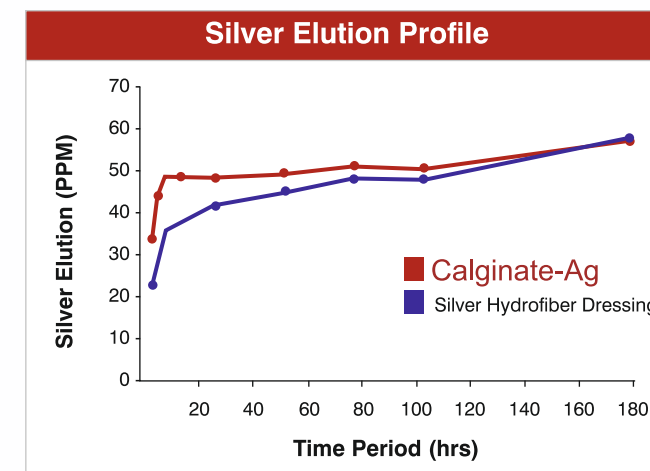
Enhanced Performance of a Silver Hydro-Alginate

- Combination of CMC and Alginate enhances absorption of exudates
- 24% Faster initial silver elution - Quickly establishes an effective level of antimicrobial activity
- Sustained antimicrobial action (upto 7 days) Antibiofilm properties
- Effective against microbes - MRSA, MRSE, VRE, S.aureus, E.coli, Candidaalbicans, P. aeruginosa
- Proven absorption capacity - equivalent to available silver hydrofibre dressings in the market
- Faster gelling-soft gel follows the contours of wound bed
- High wet strength - allows one piece removal
- Reduces odour



CALG

1 3

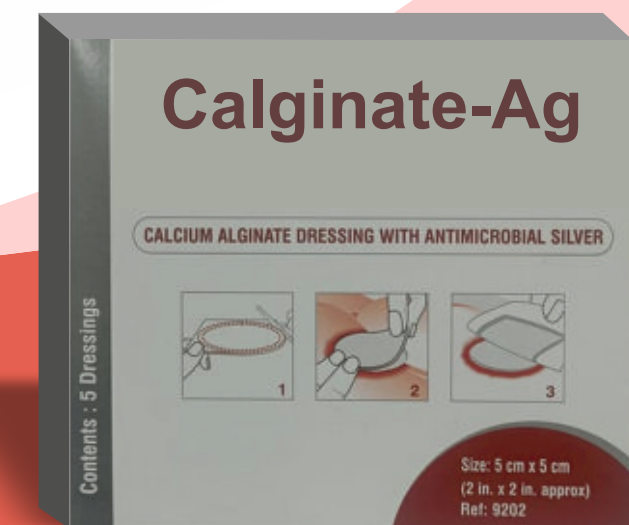


1. Recovery of Biofilm Bacteria from Gauze at Specified Time-point

Code	Dressing Size (cm)	Dressings per carton
Pad	10 x 10	5

INDICATIONS

- Diabetic foot ulcers
- Venous leg ulcers
- Arterial leg ulcers
- Donor sites
- Pressure ulcer
- Oncology wounds



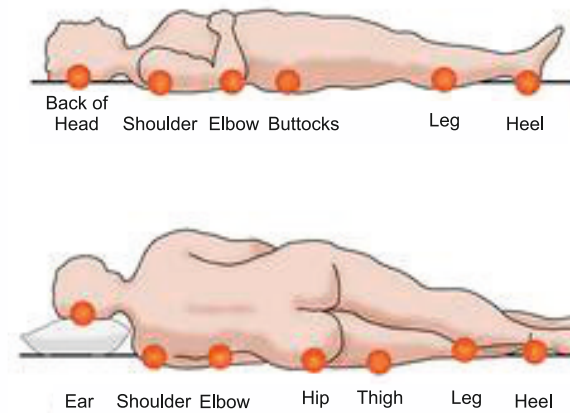
for Healing wounds to protect the epithelium and for dry wounds to retain the moisture

HYDROCOLL

Hydrocolloid Dressing

For effective management of Pressure Ulcers

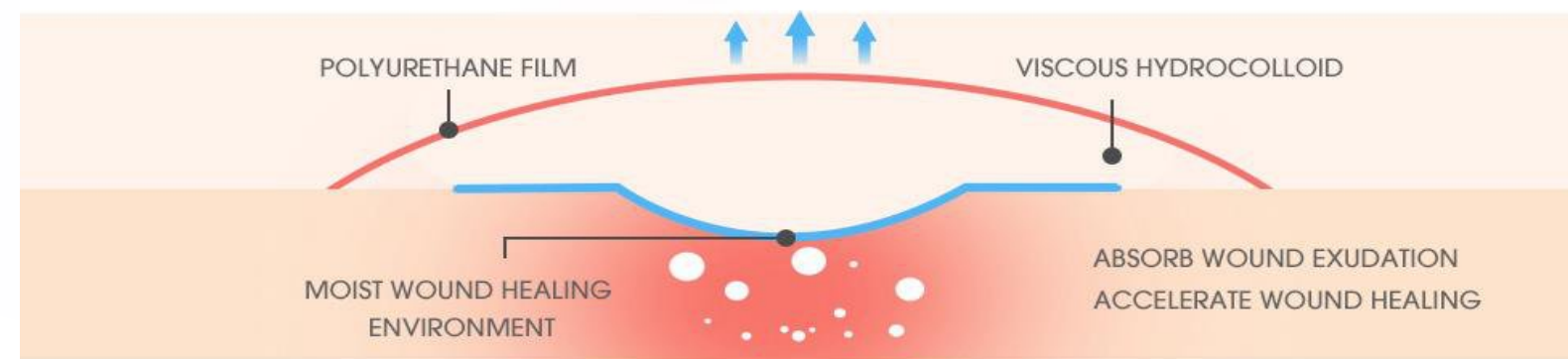
- ◆ Forms hydrophilic gel on absorption of exudates
- ◆ Facilitates autolytic debridement
- ◆ Promotes formation of granulation tissue & angiogenesis
- ◆ Lowers wound pH; reduces chances of infection
- ◆ Decreases scar formation



DRESSING SIZE(CM)	HYROCOLLOID ISLAND SIZE(CM)	SHAPE	DRESSING PER CARTON
10X10	7X9	SQUARE	10

HOW DOES IT WORKS

COVER ,PROTECT, HEAL



APPLICATIONS



For Exudating wounds with sensitive Skin

SILIFOAM

Silicone Foam Dressing

NEMI

absorbs exudate 10 times the weight of the foam

15



Controls exudate,
leakage,pain and odour

Wound Care Practitioners
Reduces load due to
Frequent Dressing Change

- High absorption and excellent fluid retention - Controls leakage and maceration'*
- Minimizes pain and trauma at dressing changes
- Reduced dressing change
- Flexible foam dressing which provides Cushioning and comfort
- For moderate to high Exudating wounds
- with Silicone Layer

**Easy to remove
does not stick
to the wound**

INDICATIONS

- Diabetic foot ulcers
- Arterial ulcers
- Pressure ulcers
- Numatic & surgical wounds
- Venous leg ulcers

Dressing Size (cm)	Shape	Dressings per carton
10 x 10	Pad	5



for Healing wounds to protect the epithelium and for dry wounds to retain the moisture

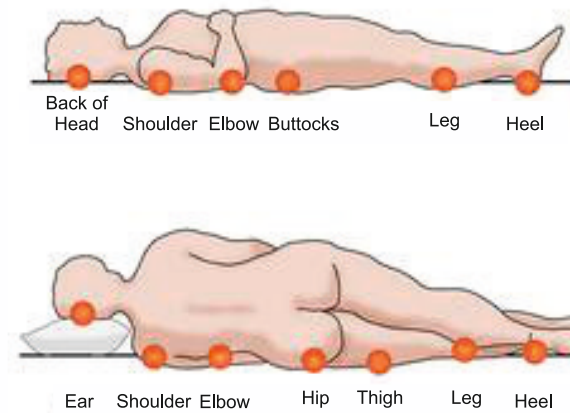
HYDROCOLL

Hydrocolloid Dressing

For effective management of Pressure Ulcers

b-7

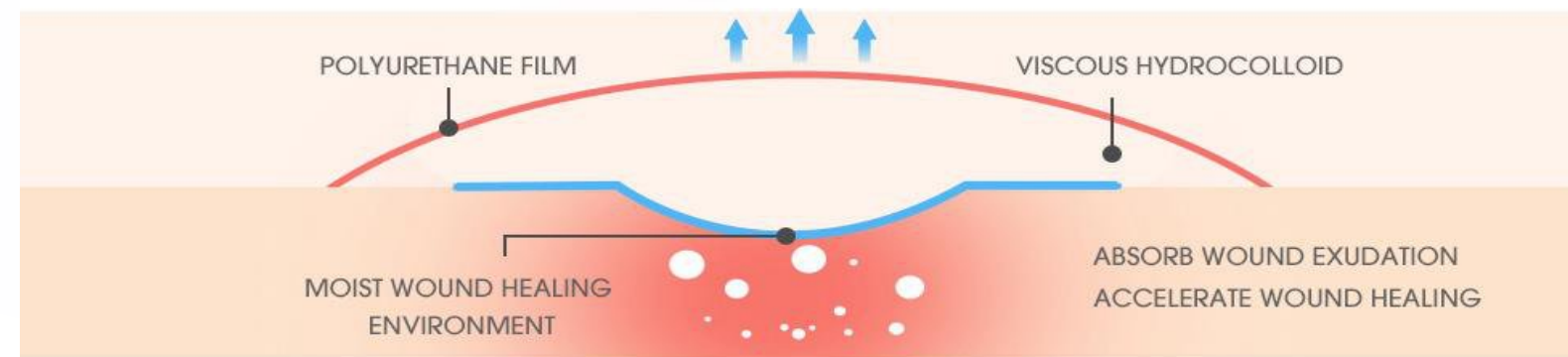
- ◆ Forms hydrophilic gel on absorption of exudates
- ◆ Facilitates autolytic debridement
- ◆ Promotes formation of granulation tissue & angiogenesis
- ◆ Lowers wound pH; reduces chances of infection
- ◆ Decreases scar formation



DRESSING SIZE(CM)	HYDROCOLLOID ISLAND SIZE(CM)	SHAPE	DRESSING PER CARTON
10X10	7X9	SQUARE	10

HOW DOES IT WORKS

COVER, PROTECT, HEAL



APPLICATIONS



NEMI

SILVER WASH

Colloidal Silver Solution 10 PPM

ANTIMICROBIAL EFFICACY AGAINST PJI PATHOGENS

In vitro and ex vivo studies demonstrate colloidal silver at 10 PPM achieves superior biofilm reduction across clinically relevant PJI organisms, with *Pseudomonas aeruginosa* showing the highest susceptibility due to silver's multi-target mechanism bypassing its efflux pump resistance.

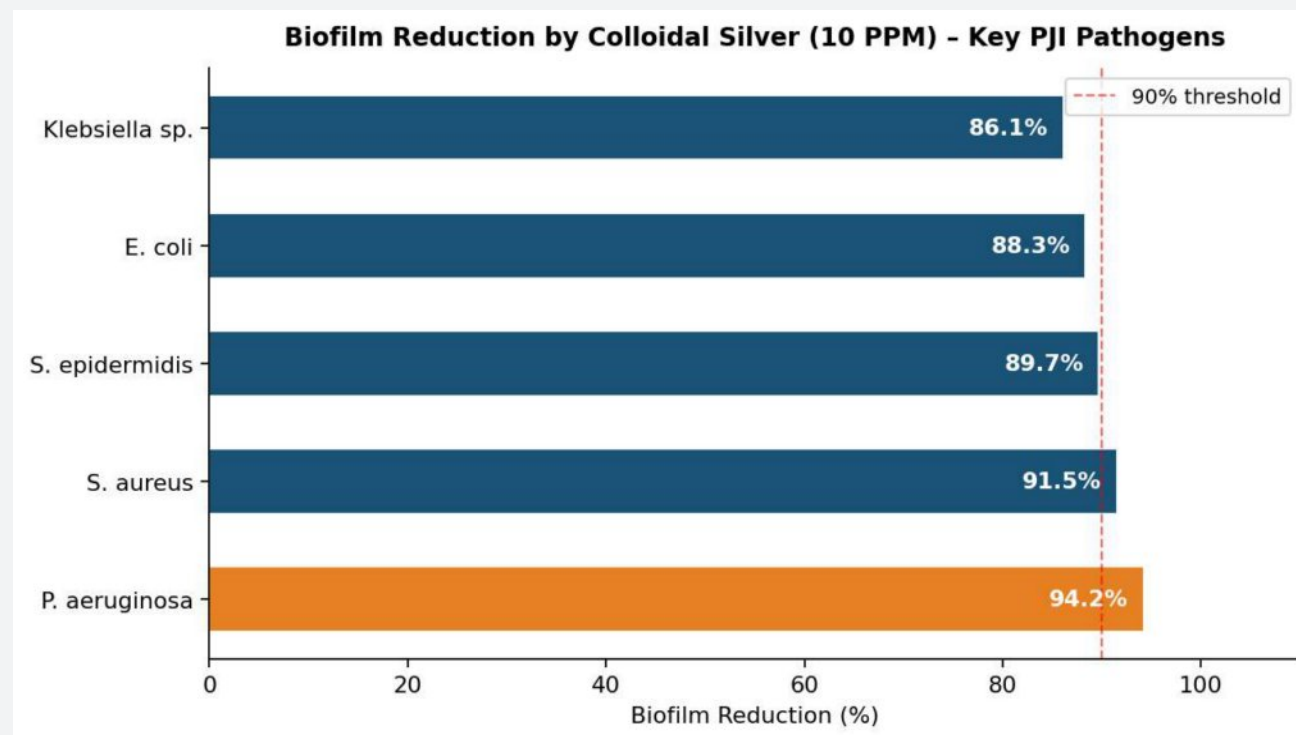


Fig. 1 — Biofilm reduction (%) following 24-hr exposure to Colloidal Silver 10 PPM (based on published in vitro biofilm eradication studies; n=6 per organism)

Key Observations:

- *P. aeruginosa* biofilm reduction of 94.2% — highest among tested organisms
- All organisms showed >85% biofilm reduction, exceeding clinical thresholds
- No development of silver resistance noted in serial passage studies at 10 PPM
- Efficacy maintained in the presence of wound exudate and organic material

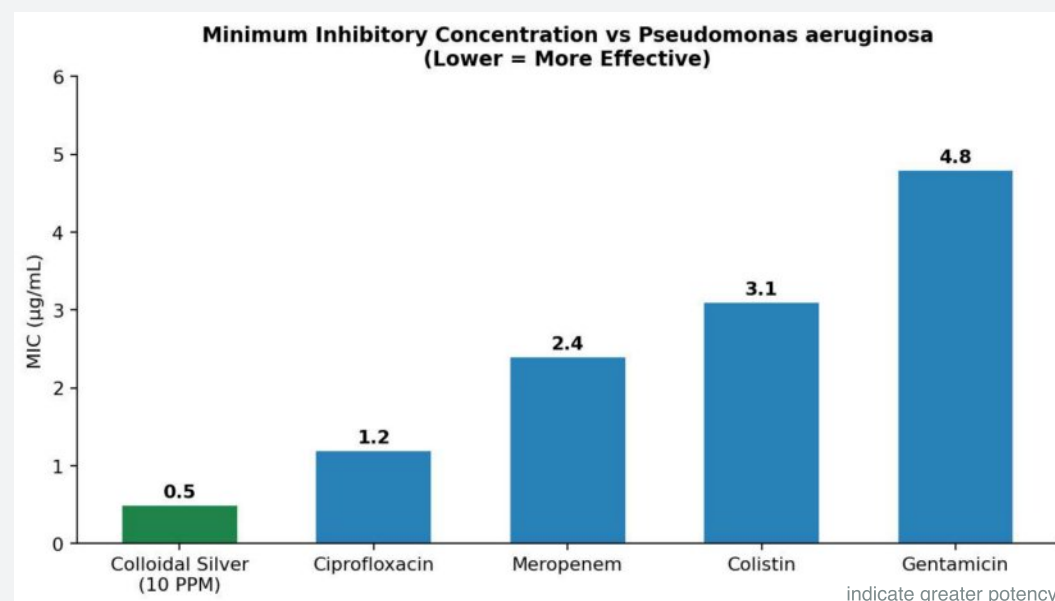


Fig. 2 — MIC values (µg/mL) against *P. aeruginosa*: Colloidal Silver vs common anti-pseudomonal agents. Lower values indicate greater potency.

Role in Prosthetic Joint Infections (PJI) and *Pseudomonas aeruginosa* Management

4. PSEUDOMONAS AERUGINOSA: SPECIAL FOCUS

Pseudomonas aeruginosa is an opportunistic, Gram-negative pathogen uniquely adapted to prosthetic surfaces. Its intrinsic resistance mechanisms — including multiple efflux pumps (MexAB-OprM, MexCD-OprJ), porin loss, beta-lactamases, and rapid biofilm formation — make it the most challenging organism in PJI management.

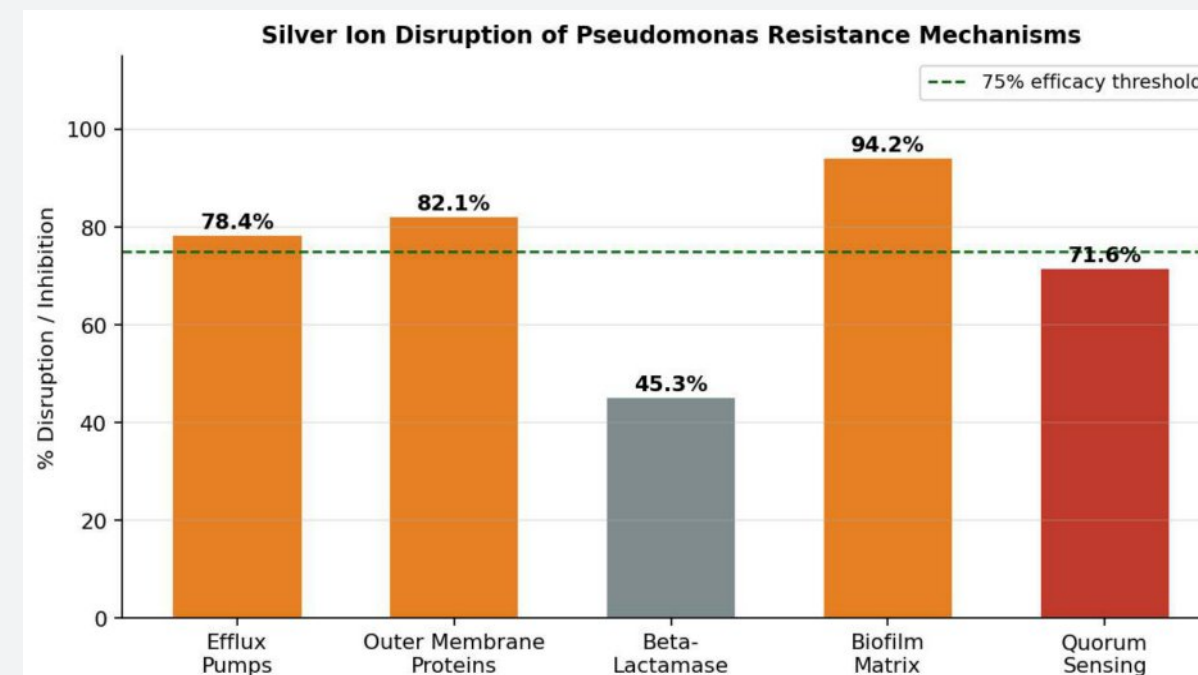
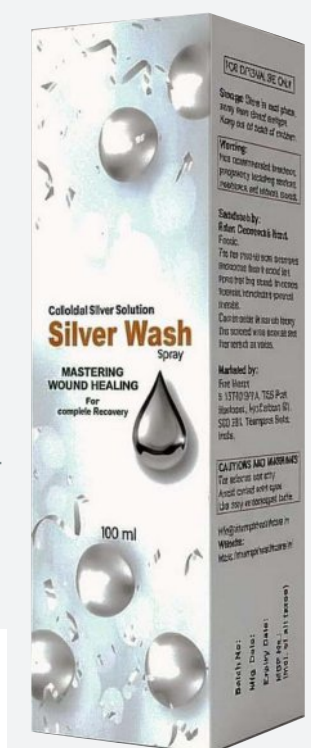


Fig. 3 — Silver ion disruption (%) of key *Pseudomonas* resistance mechanisms. Orange bars: >75% disruption (highly effective). Values from published mechanistic studies.



5. SILVER WASH IN PJI MANAGEMENT PROTOCOLS

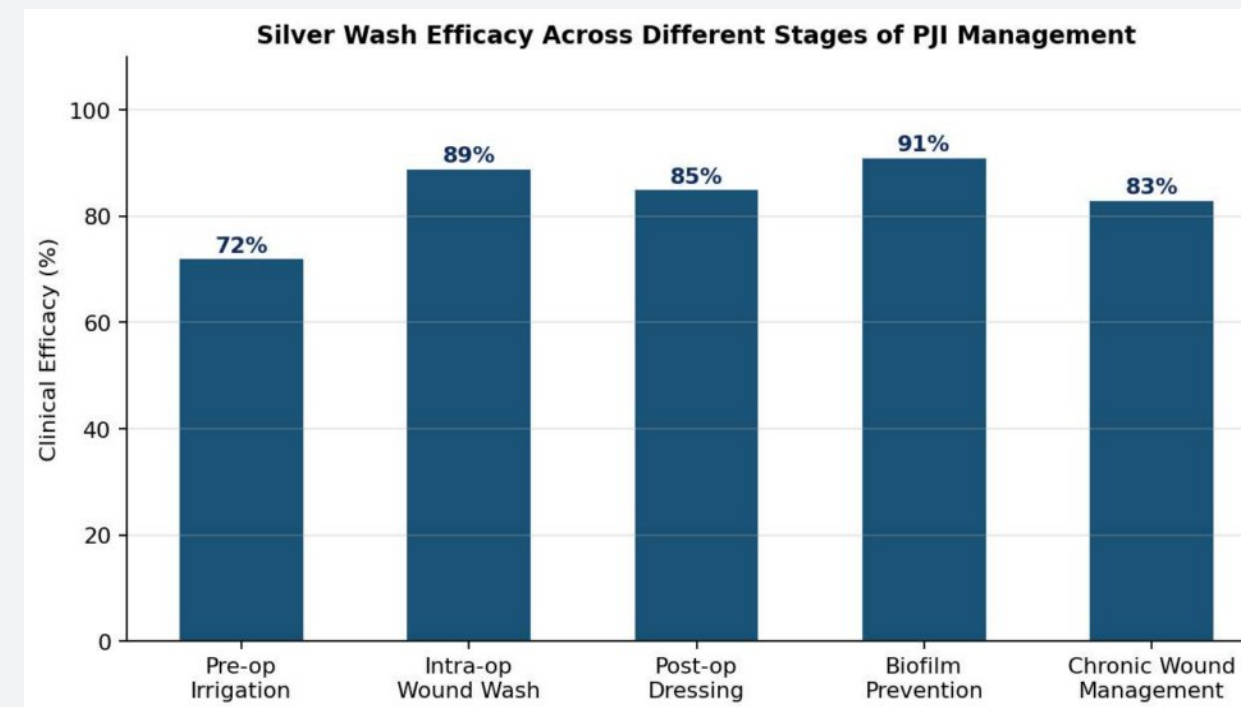


Fig. 4 — Clinical efficacy of Silver Wash at each stage of PJI management protocol.

b 6

GLYCOCALYX™ ANTIMICROBIAL SKIN AND WOUND CLEANSING SOLUTIONS

RAPIDLY ELIMINATES BIOFILM MICROBES

Preventing Biofilm Formation on Implants: The *In Vitro* Performance of Surgical Irrigation

Fahimeh Tabatabaei, PhD, Rebecca McMahon, PhD, Nina Bionda, PhD

To evaluate the effectiveness of commercial surgical irrigation solutions in preventing attachment of bacteria, coupons (n=4 per group), attached to the bottom of 24-well plates using a medical grade silicone adhesive, were first exposed to surgical solutions for two minutes. After aspiration, 1x10⁶ CFU of bacteria in synovial fluid was added to each coupon. The inoculated coupons were incubated at 37°C for 24 hours. Following 24 hours of contact time with the inoculum, the coupons were detached from the plate, and bacteria adhered to the material were recovered through a series of sonication debridement steps. The bacteria were enumerated using standard serial dilution and agar plating method. A schematic of this method is shown in **Figure 1**.

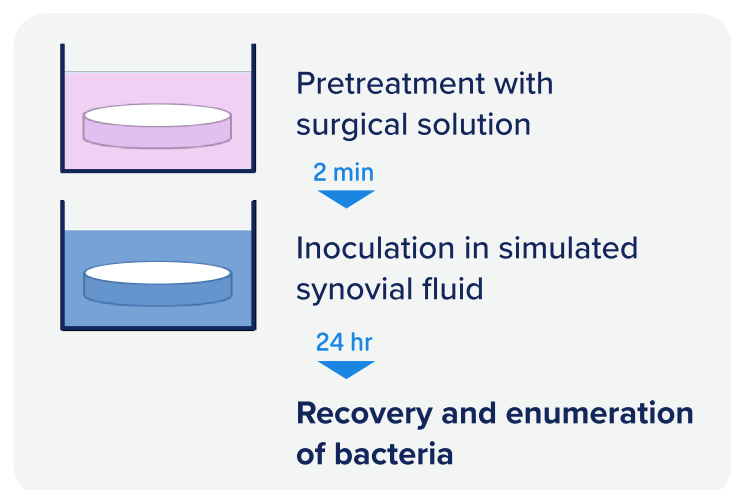


Figure 1: Schematic of the biofilm prevention model used in this study.

SOLUTION	KEY INGREDIENTS	NOTES
Saline	0.9% sodium chloride Solution	Commonly used in wound care to wash and cleanse tissues without antimicrobial activity
Surgiphor™ Antimicrobial Irrigation System	0.5% povidone-iodine (PVP-I)	Potential cytotoxic effects of iodine on human cells; deep brown color and strong smell
Glycocalyx Advanced Surgical Solution	0.1% polyhexamethylene biguanide (PHMB), chelators (EDTAs), vicinal diols	Synergistic composition with enhanced antimicrobial properties of a broad-spectrum, safe and effective antimicrobial compound
Prontosan® Wound Irrigation Solution	0.1% polyhexamethylene biguanide (PHMB)	Safe and effective antimicrobial compound
Irrisept® Antimicrobial Wound Lavage	0.05% chlorhexidine gluconate (CHG)	Significant and irreversible damage to cell; cause tissue irritation; can cause allergic reactions
Bactisure® Wound Lavage	0.13% benzalkonium chloride (BZK), 10% ethanol, 0.6% acetic acid	High cell toxicity even after brief exposure (1 minute) in a study on 3D cultures of human fibroblasts
Vashe® Wound Solution	0.033% hypochlorous acid (HOCl)	Significant erosion and wear on cobalt chrome and titanium surgical implants; bleach smell, limited efficacy in established biofilms
Xperience™ Advanced Surgical Irrigation	32.5 g/L citric acid, 31.3 g/L sodium citrate	May cause irritation or damage to sensitive tissues, reduced efficacy in established infections
Triple Antibiotic Solution (TAS)	gentamycin, bacitracin, cefazolin	Risk of antibiotic resistance development, and it may be less effective against biofilm in short contact times

Table 1: Products tested in this study and their ingredients

RESULTS

The results of the assays are shown in **Figures 2 and 3**. GlycocalyxAdvanced Surgical Solution (Glycocalyx) demonstrated superior and consistent reductions in biofilm formation for both *Staphylococcus aureus* and *Pseudomonas aeruginosa* across all tested implantable materials. This remarkable performance, with over a 6-log reduction in microbial load, especially

against challenging pathogens like *P. aeruginosa*, underscores its role as a key component in infection prevention protocols designed to reduce costly revision surgeries. The simulated synovial fluid used in the study closely mimics clinical conditions encountered during joint replacement surgeries.⁵ The fact that Glycocalyx maintained its efficacy under these conditions further validates its use in real-world surgical applications.

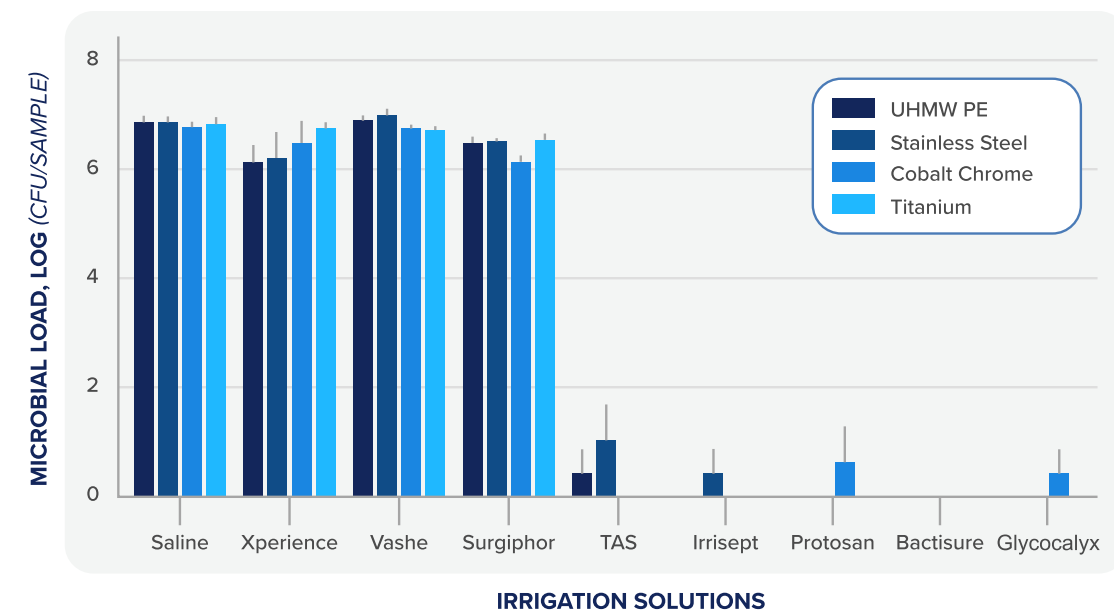


Figure 2: Biofilm prevention effectiveness of various commercial surgical irrigation solutions on coupons after a twenty-four hour challenge with MRSA in simulated synovial fluid.

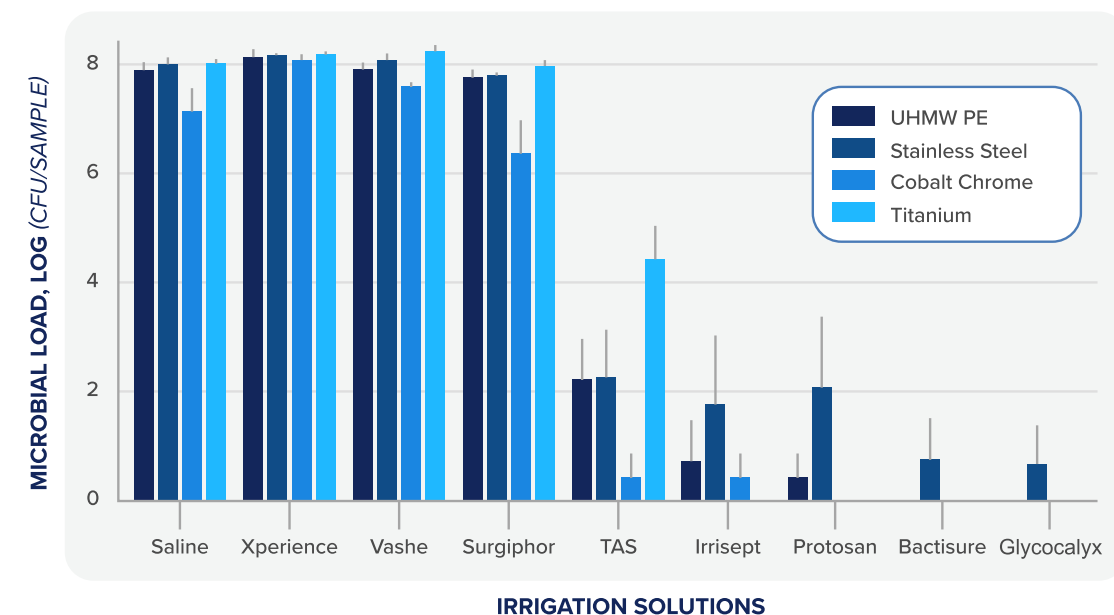
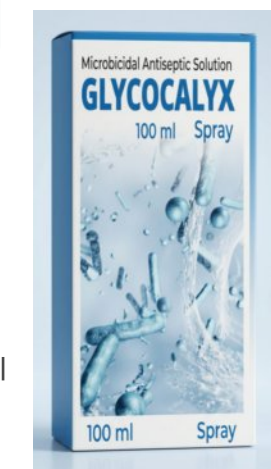


Figure 3: Biofilm prevention effectiveness of various commercial surgical irrigation solutions on coupons after a twenty-four hour challenge with *Pseudomonas aeruginosa* in simulated synovial fluid.

CONCLUSION

The results of this study provide valuable insights into the effectiveness of various surgical irrigation solutions in preventing biofilm formation by *S. aureus* and *P. aeruginosa* on different implantable materials. One of

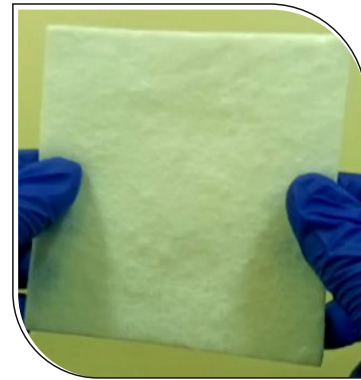
the most significant findings is the superior performance of the PHMB-based technology in Glycocalyx, which resulted in over 6-log reduction in microbial load across all implantable materials and pathogens tested compared to untreated control materials.



Soft Tissue Healing Leads to

DRYCOLL-G

Sterile Medicated Collagen Membrane with Gentamicin IP 0.2% w/w

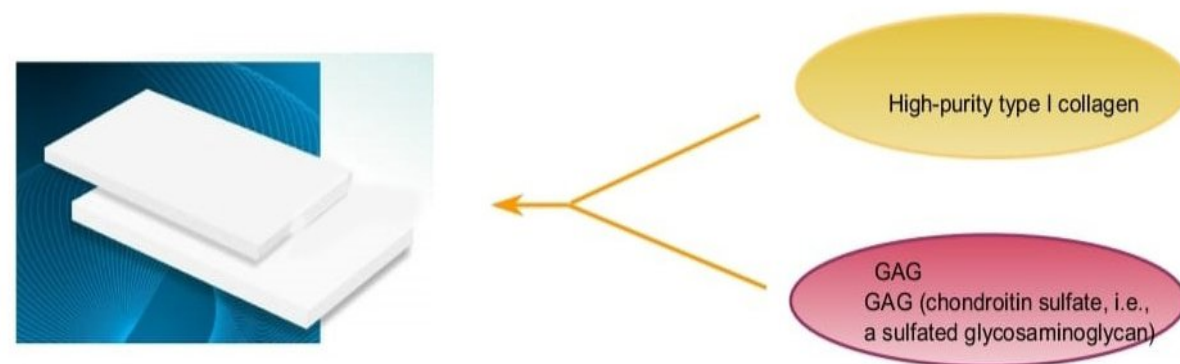


Single, Double Layer Collagen Dermal Membrane

NO SOFT TISSUE HEALING...
NO BONE HEALING.

RESPECT THE SOFT TISSUE TO ENSURE SUCCESSFUL ORTHOPEDIC OUTCOMES.

Product components



Bone Healing for Successful orthopedic outcomes

For Tendon Repair & Adhesion Wrap Over Repaired Tendon to Prevent Adhesion

The Journal of Traditional Chinese Orthopedics and Traumatology, December 2012, Volume 24, Issue 12 (Total Issue 907). 27.

Abstract: Objective: To observe clinical efficacy and safety of type I bovine collagen biomembrane in preventing adhesion after operation of finger flexor tendon injury. Method: 72 patients with fresh flexor tendon injury in hand region.

In treatment group, type I bovine collagen biomembrane was used to enwrap the anastomosed tendon ruptured ends, while in control group, no drugs or special treatment was given at injury site.

Results: 1 Safety. Wounds of two group achieved one-phase healing without infection or tendon re-rupture. Blood and urine routines, biochemical indicators and ECG showed no abnormality. Hand tendon total active mobility. Treatment group: 19, 11, 5 and 1 cases were excellent, good, moderate and poor, respectively; control group: 8, 10, 13 and 5 were excellent, good, moderate and poor, respectively. Hand tendon total active mobility in treatment group was better than that of control group ($Z = -3.229, P = 0.001$). Conclusion: Type I bovine collagen biomembrane can safely and effectively prevent adhesion after operation of finger flexor tendon injury. Key words: Hand injury; type I collagen; tendon adhesion; treatment; clinical research.

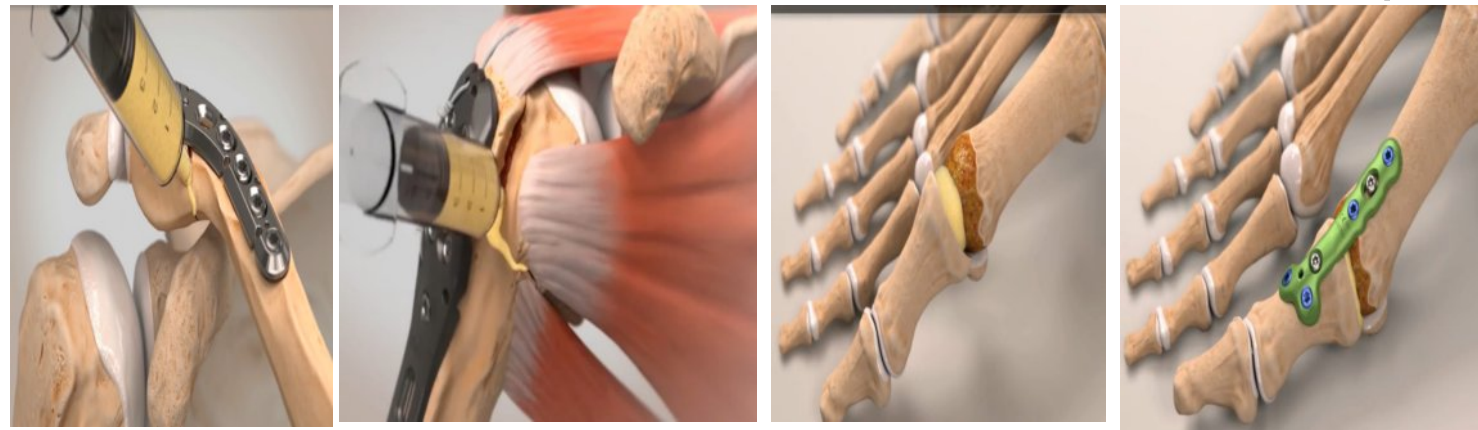
b 4



DryColl DBM $\frac{2CC}{5CC}$

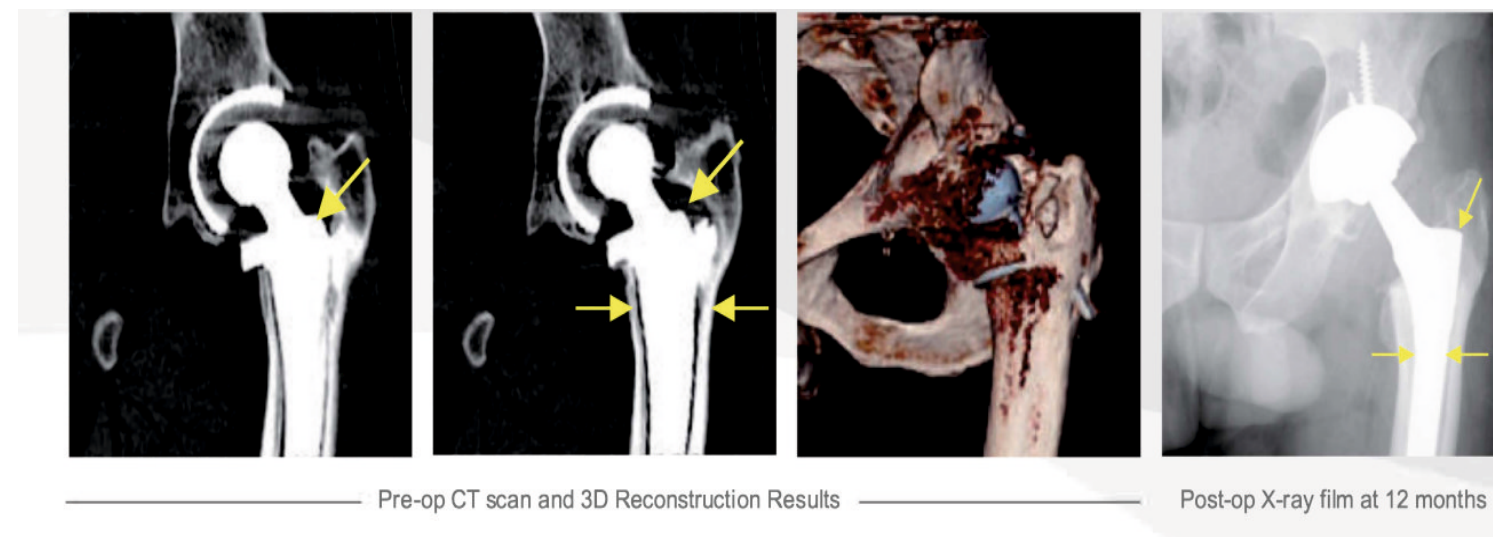
De-Mineralized Bone Matrix with Hydroxy Apetite
Biomimetic Bone Matrix Closest to Autologous Bone

Has
Osteo Conductive & Osteo Inductive
Properties



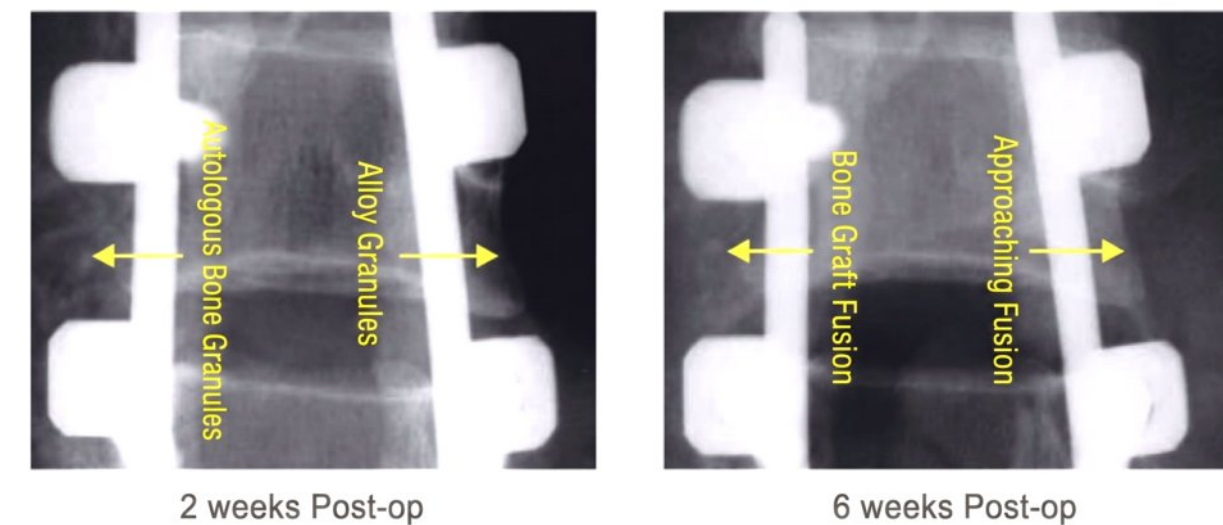
Hip Revision Bone Graft (Proximal Femur Defect Repair)

Male 65 Years, 6 years after hip replacement, femoral prosthesis loosened, hip joint CT scan and 3D reconstruction images showed proximal bone defect. Proximal femoral bone remodeling at 12 months after hip revision with bone grafting, the effect is good.



Bone Graft Fusion between Transverse Processes

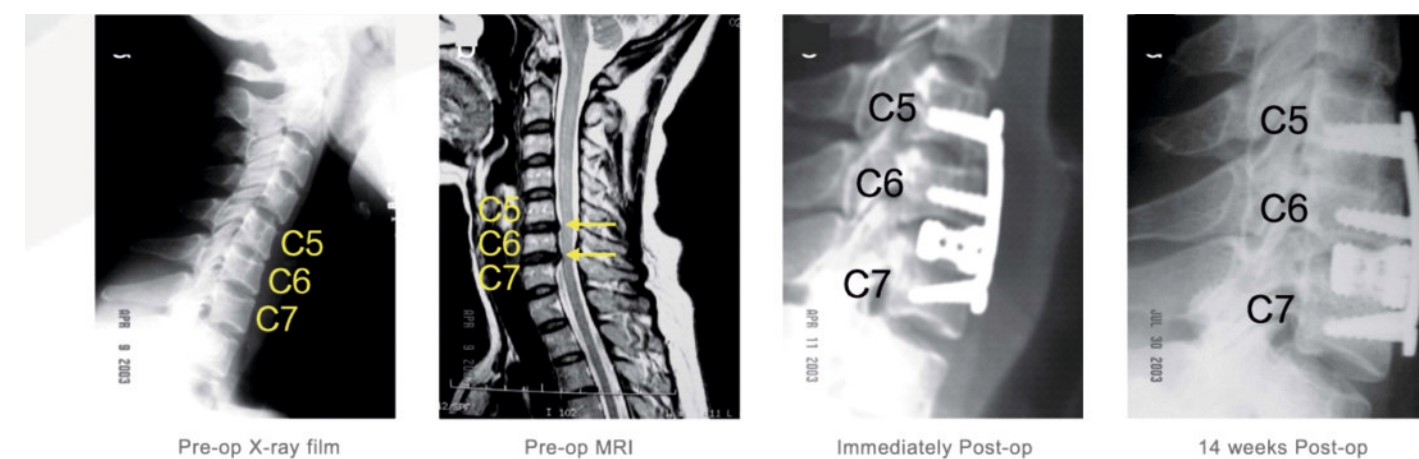
Female, 45 years old, lumbar spinal stenosis (L4-S4), lumbar disc herniation (L4/L5), low back pain with right lower limb pain for 4 years, intermittent claudication, regular conservative treatment failed. X-ray review at 2 weeks (left) and 6 months (right) after the operation. At 6 months after the operation, the right side of the bone graft had fused, and the left side was also close to osseous fusion. The patient's symptoms disappeared completely and returned to normal live and work.



b 3

Cervical Interbody Fusion

Female, 42 years old, with a cervical spine disease history of more than 4 years, incomplete paraplegia, intervertebral bone graft fusion, C5/6 implanted Drycoll DBM 1.5cm³. C6/7 was implanted with a metal intervertebral fusion device, and the bone graft hole was filled with DryColl DBM. The X-ray film of C5/6 and C6/7 showed similar intervertebral fusion effects at 14 weeks after operation, and good intervertebral fusion was obtained. fusion effect.



in Tunnel wounds and deep routed Wounds

COLLOFIL

Collagen particles

COLLOFIL MM

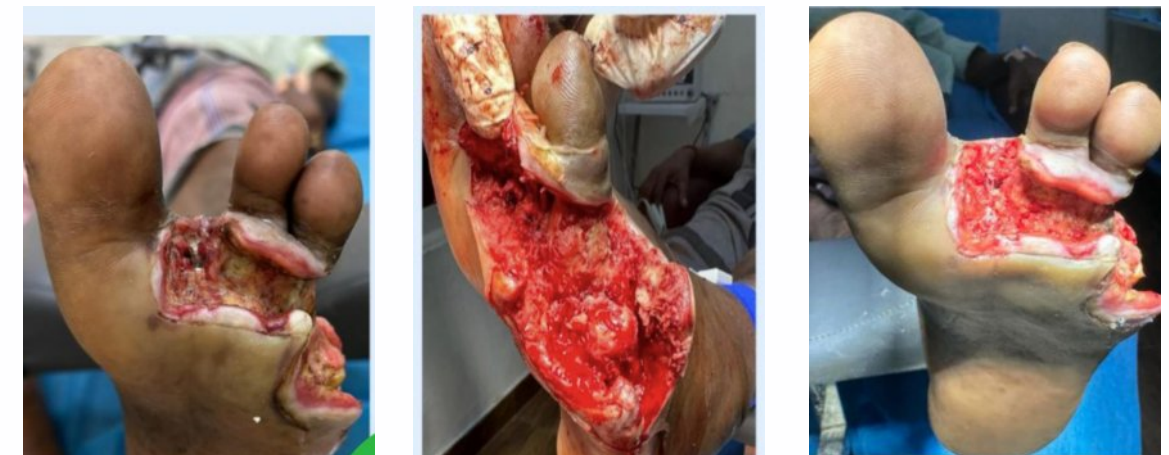
Collagen particles with muprocin & metrodinazole



Infected deep routed wounds

Collagen particles are made of modified collagen and polypeptides and can be used for up to 30 days to treat wounds such as:

- Partial- and full-thickness wounds
- Pressure injuries Venous ulcers
- Diabetic ulcers
- Partial-thickness burns Acute wounds
- Abrasions Traumatic wounds



DEB

Fill the pit with collagen based particles

Gentamycin is effective in Diabetic Wounds

GENMYCIN™

Gentamycin in collagen base

Role of Gentamycin Vs Mupirocin in Diabetic Wounds

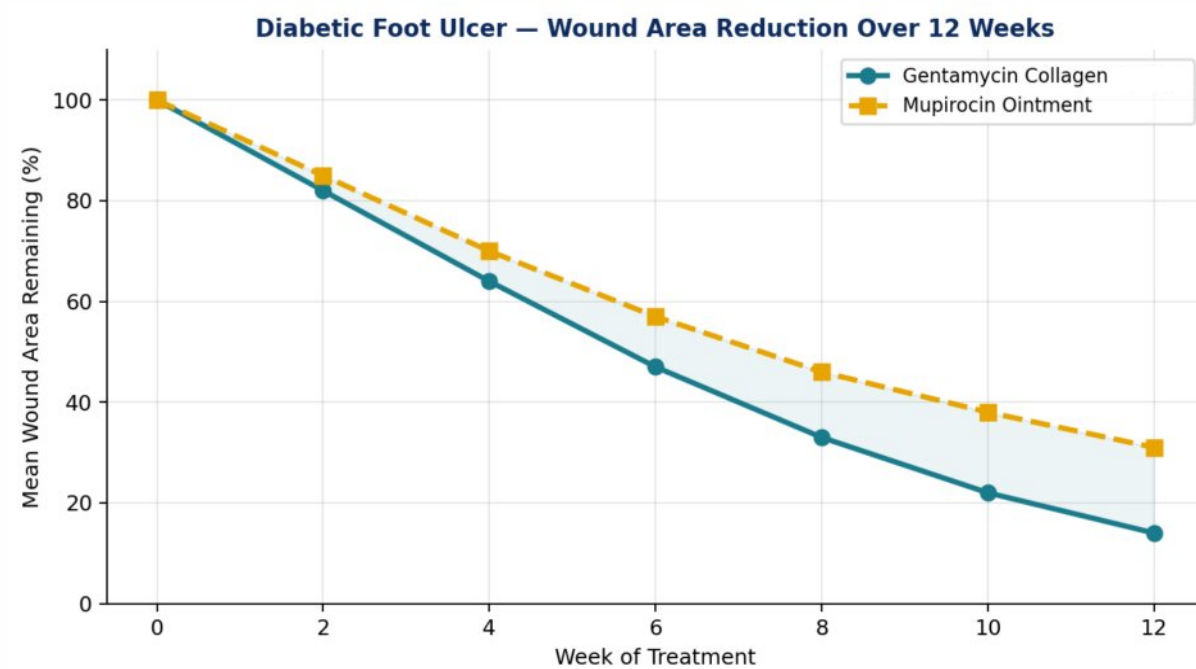


Figure 1 — Gentamycin Collagen Sponge consistently demonstrates faster wound area reduction in diabetic foot ulcers compared to Mupirocin Ointment across all measured time points. The divergence is most pronounced between weeks 4 and 10.

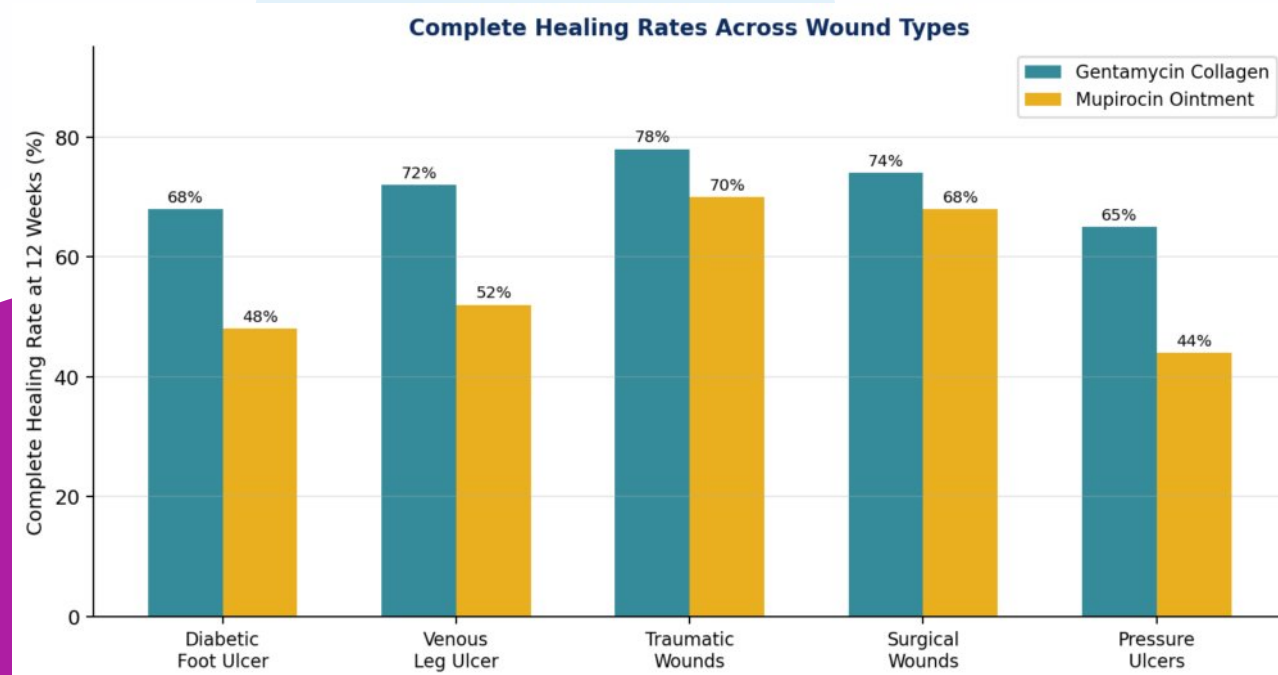
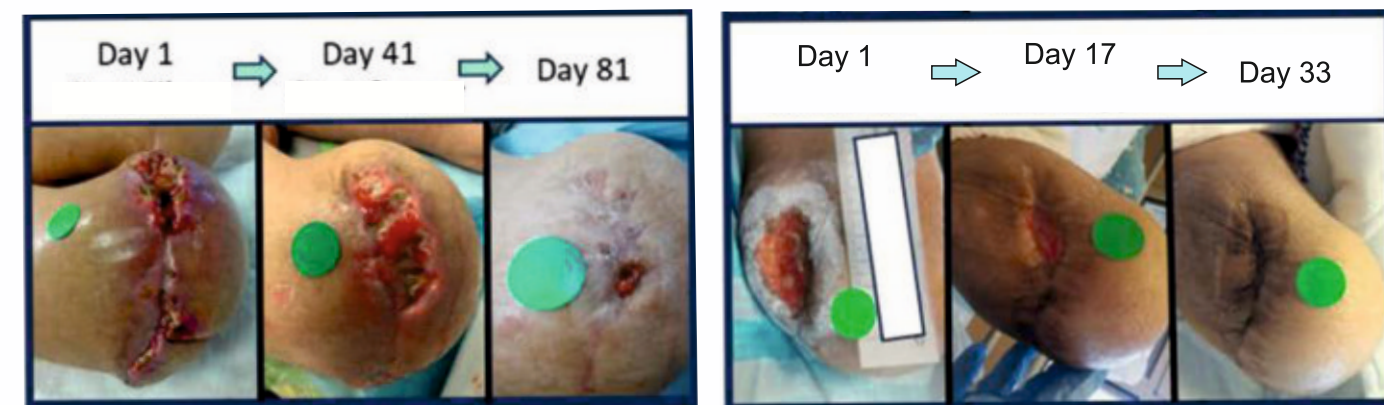


Figure 3 — Gentamycin Collagen Sponge outperforms Mupirocin in all wound categories analysed, with the greatest differential seen in diabetic and pressure ulcers.



Application of the gentamicin-impregnated collagen shortened wound healing duration after minor amputations in diabetic patients by almost 2 weeks when compared to the control group. The median wound healing duration in gentamicin group was 3.0 weeks.

GEN





Maintaining function

Concepts for
Orthopedic Surgery

Triumph Helathcare



Pioneer
In NanoSilver Technology