# The Increasing Role of Synthetic Skin Substitutes RUTGERS

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#### BACKGROUND

- Chronic wounds, burns, and traumatic injuries are difficult to manage due to high risks of infection, delayed healing, and scarring.
- Traditional biologic skin substitutes (CAMPs) have been effective but carry risks such as disease transmission, allergic reactions, high costs, and ethical concerns.
- Synthetic skin substitutes have emerged as alternatives, offering:
- No risk of disease transmission
- Consistent, durable performance
- Improved cosmetic outcomes
- Elimination of animal-derived material
- Synthetic matrices integrate into tissue without leaving permanent implants, supporting natural wound healing.
- This study compares six synthetic products:
- NovoSorb BTM, SupraSDRM, Microlyte, Restrata, Renovoderm Phoenix Wound Matrix. and Mirragen Advanced Wound Matrix.

# METHODS

- Identified six synthetic skin substitutes through Centers for Medicare and Medicaid Services database and manufacturer outreach.
- Contacted manufactures for product details on composition, mechanism, clinical use, and cost.
- Reviewed studies and clinical trials via PubMed, Google Scholar, and ClinicalTrials.gov.
- Compared products based on composition, applications, advantages, and outcomes.

# CONCLUSION

- Synthetic skin substitutes offer safe, effective alternatives to biologic products for managing complex wounds.
- Products like NovoSorb BTM, SupraSDRM, Microlyte, Restrata, Renovoderm, and Mirragen promote healing, reduce infection risk, and improve cosmetic outcomes.
- Key advantages include no disease transmission, longer shelf life, consistent performance, and lower environmental impact.
- While early results are promising, further large-scale studies are needed to assess long-term outcomes and cost-effectiveness.

### **TAKE-HOME MESSAGE**

Synthetic skin substitutes provide innovative, reliable solutions for complex wounds, with growing evidence supporting their role in modern wound care.

### RESULTS

Product	Composition	Indications	Advantages	Limitations
NovoSorb BTM	Synthetic, bioabsorbable polyurethane	Burns, trauma, chronic ulcers	Versatile for complex wounds, good cosmetic outcomes	Two-stage procedure increases cost and treatment time
SupraSDRM	Synthetic, polylactide- based matrix	Diabetic ulcers, burns, trauma wounds	Accelerated healing, reduces pain, cost-effective	High initial cost, limited large- scale studies
Restrata	Fully synthetic, mimics ECM	Diabetic ulcers, pressure sores, burns	Promotes neovascularization, no disease transmission risks	Newer product, requires more validation in long-term use
Renovoderm Phoenix Wound Matrix	Fully synthetic, bioresorbable matrix with synthetic polymers mimicking ECM	Diabetic foot ulcers, surgical wounds, burns	Supports tissue regeneration, reduces chronic inflammation, stimulates angiogenesis, potential cost-effectiveness	Limited to initial case studies and pilot trials, larger RCTs required for broader validation
Mirragen Advanced Wound Matrix	Borate-based bioactive glass	Diabetic foot ulcers, venous and pressure ulcers, and burns	Enhance angiogenesis, extracellular matrix deposition, and bacterial control	Limited controlled RCTs and studies
Microlyte	Bioresorbable matrix with silver ions	Complex and chronic wounds	Potent bacterial biocidal activity, rapid wound closure	Primarily for high-risk cases, more long-term studies needed

Table 1: Comparative Analysis of Synthetic Skin Substitutes





a. Calcinosis and Lesions b. Charles Procedure From Knee to Ankle.

d. Pseudomonas Infection



e. Wound Debridement and Restrata Application Application

f. 1 month post Restrata g. Autograft and STSG wrapped in nonadherent dressing

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