

**XSENSOR** Intelligent Dynamic Sensing / **FREE WEBINAR** / **WEDNESDAY, FEBRUARY 8, 2023**  
**Plantar Pressure Mapping in Endurance-Based Sports**  
 How to Test Running Biomechanics with XSENSOR's Intelligent Insoles  
 REGISTER TODAY. SPOTS ARE LIMITED.



**Relieve Big Toe Joint Pain**  
 Carbon Fiber **1stRaythotics™**  
 Thin, Comfortable, Flexible Support



**PediFix**  
**BUY NOW**

≡ MENU

Search...

**X** Intelligent Dynamic Sensing  
**FREE EBOOK**  
**Testing & Monitoring Gait Performance**  
**DOWNLOAD YOUR COPY NOW**



// January 2022

# The Role of Collagen Dressings in Wound Management

Facebook

Twitter

Pinterest

Email

More



Figure. A deep wound on leg before (a) and after 28 days (b) of collagen dressing. Image from Singh O, Gupta SS, Soni M, Moses S, Shukla S, Mathur RK. Collagen dressing versus conventional dressings in burn and chronic wounds: A retrospective study. J Cutan Aesthet Surg. 2011;4:12-6.

*By Windy Cole, DPM, CWSP*

Collagen is the most abundant protein in the human body. It acts as a support structure, giving the skin strength and elasticity. Collagen also plays an essential role in wound healing.<sup>1</sup> During the proliferative phase, fibroblasts migrate into wounded tissues and lay down new collagen to support the extracellular matrix (ECM), fill in the wound with granulation tissue, and aid in wound contracture. Acute and chronic wounds also contain matrix metalloproteinases (MMPs). These enzymes regulate degradation and deposition of the ECM. When present in excess, MMPs can lead to disorganization of the ECM, disrupt collagen deposition, and prolong wound healing.<sup>1</sup>

Dressings containing collagen have utility in chronic wound management. These biomaterials enhance new tissue growth by improving fibroblast migration into the wound helping to promote angiogenesis and re-epithelialization.<sup>2</sup> Collagen dressings also support wound healing by binding with and inactivating excessive MMPs. In these instances, the collagen in the dressing acts as a sacrificial substrate so that the ECM is spared.<sup>2</sup> Collagen dressings are also impermeable to bacteria.<sup>2</sup>

Collagen dressings are commercially available in sheets, powders, and gels. Common sources include bovine, equine, porcine, avian, or piscine. Collagen products are to be used as primary dressings, meaning they need to contact the wound bed to be effective. The wound bed should be free of necrotic tissue and large quantities of adherent fibrin or slough. Collagen dressings also promote a moist wound healing environment by absorbing mild to moderate exudate.

The utility of collagen dressings has been well documented in the wound management literature. A comparative study by Singh et al<sup>3</sup> found that healthy granulation tissue was present at a statistically significant level in the patient cohort treated with collagen versus those that received conventional care dressings. The researchers also noted that patients treated with collagen dressings also exhibited a lower need for skin grafting. Collagen dressings were also shown to be very easy to apply.

### **The Future of Collagen Dressings**

A recent study from the *Bosnian Journal of Basic Medical Sciences*<sup>4</sup> investigated the efficacy of a novel carbodiimide cross-linked freshwater fish collagen sponge

containing vancomycin in the treatment of infected wounds in a rat model. The researchers noted a decrease in the number of methicillin-resistant *Staphylococcus aureus* CFUs in the infected site following the local administration of the vancomycin-releasing cross-linked collagen sponge.

A recent literature review in the *Journal of Biomedical Materials Research Part A*<sup>5</sup> focused on the advances of electrospun collagen materials for chronic wound management. Breakthroughs in tissue engineering technology are giving rise to exciting new collagen blends and innovative nanofiber technologies.

When making product selections, clinicians should choose biomaterials that are natural, non-immunogenic, non-pyrogenic, hypo-allergenic, and pain-free. Collagen dressings check off all of these boxes.

*Windy Cole, DPM, CWSP, is an adjunct professor and Director of Wound Care Research at Kent State University College of Podiatric Medicine. Dr Cole also serves as the National Director of Professional Development and Clinical Education for Woundtech. She is board certified by the American Board of Foot and Ankle Surgery and the American Board of Wound Management. She has been a dedicated wound care advocate for two decades with interests focused on medical education, diabetic foot care, wound care, limb salvage, and clinical research. Her passion to help others has led her to participate in humanitarian efforts around the world. Dr. Cole has published numerous peer-reviewed and industry articles on these topics and is a sought-after speaker both nationally and internationally. She is a feature writer for Podiatry Management and Today's Wound Clinic as well as a contributing writer for Podiatry Today. She is an Editorial Board member of Wound Management and Prevention, Podiatry Today, The Foot Journal, and Lower Extremity Review. She is also the Podiatry Section Editor for the ePlasty Journal. She is a wound care advocate on the forefront of wound research and was the 2020 World Union of Wound Healing Silver Medal Award recipient for her work in Technology-driven Research. She sits on the advisory board of multiple emerging biotech companies and has been integral in collaborating on innovative research protocols in the space.*