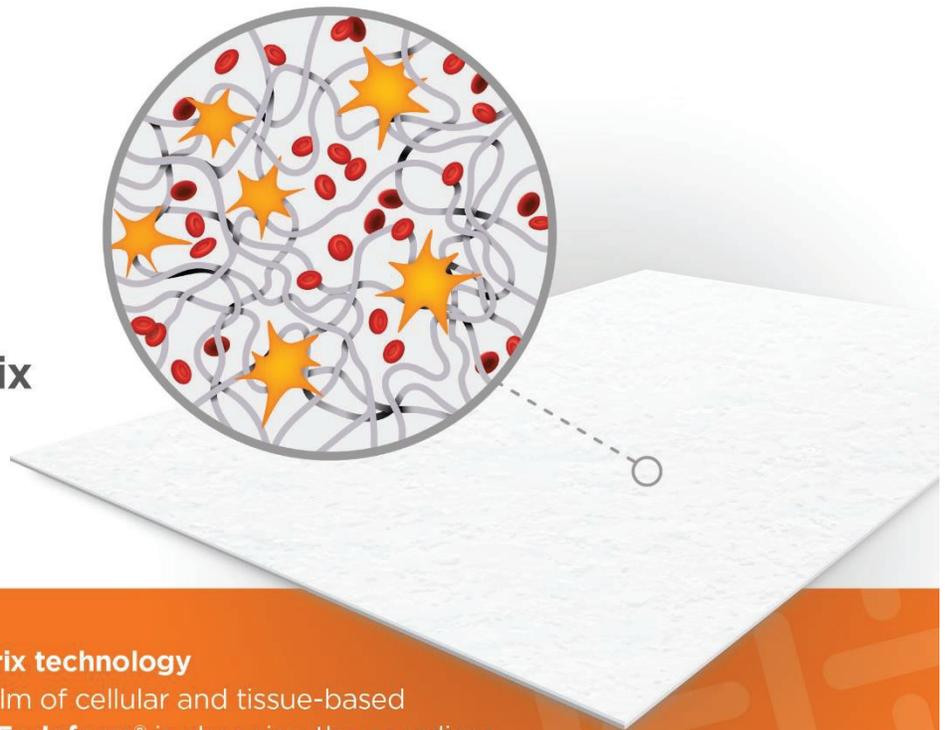




# The Impact of Endoform® on CTP\* Usage Clinical Evidence

Empowering  
wound care  
providers with  
an **advanced  
extracellular matrix**



## **Advanced extracellular matrix technology**

has traditionally been the realm of cellular and tissue-based products ('skin substitutes'). **Endoform®** is changing the paradigm by making extracellular matrix technology available to all wound care providers and is similarly priced to traditional collagen dressings. **Experience the difference today!**

\*Cellular and/or Tissue Products; ASTM F3163-16, Standard Guide for Classification of Cellular and/or Tissue-Based Products (CTPs) for Skin Wounds, ASTM International, West Conshohocken, PA, 2016, [www.astm.org](http://www.astm.org).

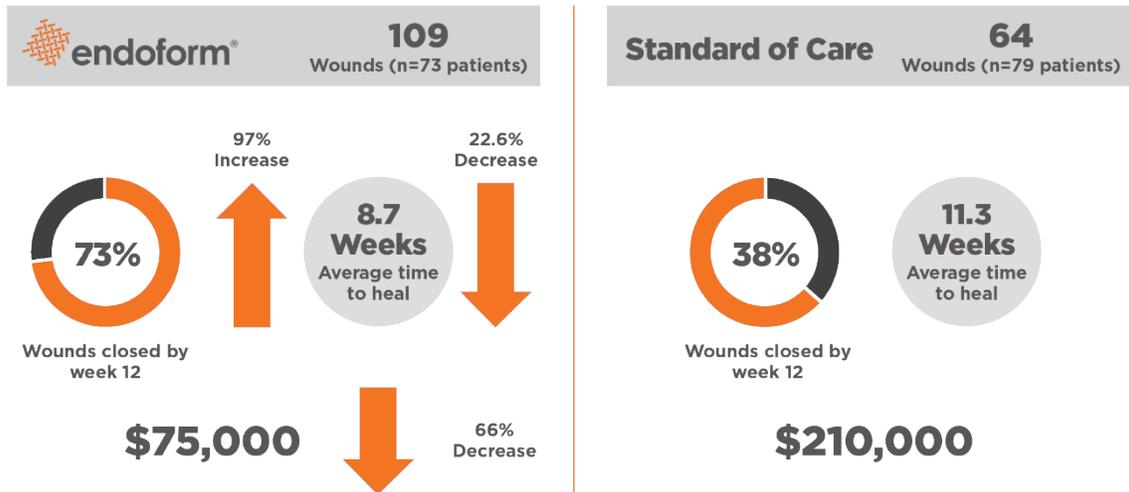
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# The Impact of Endoform® on CTP Usage Clinical Evidence

## Endoform® helps improve healing rates and reduces costs

“When a broad-spectrum MMP reducing CECM (Endoform®) was strategically utilized as part of a broader dual protocol algorithm, it offered **positive outcomes to wound closure.**” “...after the introduction of the CECM (Endoform®) in this VA hospital, the number of **wound resolutions were increased by 97% and advanced grafts (CTPs) expenditures were reduced by 66%.**”



Ferreras, D. T., S. Craig and R. Malcomb (2017). “Use of an Ovine Collagen Dressing with Intact Extracellular Matrix to Improve Wound Closure Times and Reduce Expenditures in a US Military Veteran Hospital Outpatient Wound Center.” *Surg Technol Int* 30: 61-69.



## Endoform® helps increase DFU closure rates and reduces CTP usage

Evidence has linked dermal graft (CTP) failure to elevated matrix metalloproteinase (MMP) levels in diabetic foot ulcers (DFU). The case series compared n=109 chronic wounds treated in Year 1 (without Endoform®) and 159 chronic wounds treated with Endoform® in Year 2 (Table 1). Average time to healing of DFU’s was reduced by 28.8% and CTP usage in the Year 2 period reduced by 67.6% over Year 1.

Table 1. Demographics and outcomes

	Year 1	Year 2	Increase/Decrease from Year 1 to Year 2
Total chronic wounds treated (n)	109	159	45.9%
DFUs treated (n)	51	87	70.6%
VLUs treated (n)	58	72	24.1%
DFUs healed	45 (87.3%)	<b>83 (96.2%)</b>	10.2%
VLUs healed	55 (95.8%)	<b>71 (98.8%)</b>	3.1%
Average time to healing DFU (days)	29.5	21	-28.8%
Average time to healing VLU (days)	23.1	27.1	17.3%
CTP use (units)	34	11	-67.6%
CTP expenditure (\$)	42,320	13,764	-67.5%
CECM expenditure (\$)	0	9,718	--
Total CTP and CECM expenditures (\$)	42,320	23,482	<b>-44.5%</b>

Fleck, K. A., T. Reyes and H. C. Wishall (2018). Effect of Ovine- Based Collagen Extracellular Matrix Dressings on Outcomes in an Outpatient Wound Care Center. *Society for Advanced Wound Care* - Spring, Charlotte, NC.



# The Impact of Endoform® on CTP Usage

## Clinical Evidence

Learn more



Watch Dr. Karen A. Fleck (MD) describe the use of Endoform® as a first line conventional treatment strategy for chronic wounds. Implementation of Endoform® reduced CTP usage and improved healing rates.

[www.endoform.com/resources](http://www.endoform.com/resources)



Learn more

Read Dr. Daniel T. Ferreras' retrospective case series, published in the *Surgical Technology International* (2017).

[www.endoform.com/evidence](http://www.endoform.com/evidence)



*Advanced Wound Healing*  
SURGICAL TECHNOLOGY INTERNATIONAL, Volume 30

## Use of an Ovine Collagen Dressing with Intact Extracellular Matrix to Improve Wound Closure Times and Reduce Expenditures in a US Military Veteran Hospital Outpatient Wound Center

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### ABSTRACT

A novel, comprehensive decision-making and treatment algorithm was established within a US government-run military veteran hospital in an attempt to standardize the process of outpatient wound care and streamline costs. All patients were systematically evaluated and treated using the comprehensive algorithm over a span of nine months. After three months of adherence to the algorithm, the algorithm was modified to include ovine-based collagen extracellular matrix (CECM) dressings as a first-line conventional treatment strategy for all appropriate wounds. The purpose of this retrospective analysis was to evaluate the hospital's change in cellular and/or tissue-based graft usage and cost, as well as wound healing outcomes following modification of the wound care standardization algorithm. Data from the first quarter (Q1; three months) of protocol implementation were compared to the subsequent two quarters (six months), during which time the first-line dressing modification of the protocol was implemented. Results showed that between quarters 1 and 3, the percentage of wounds healed increased by 95.5% (24/64 to 80/109), and the average time to heal each wound decreased by 22.6% (78.8 days to 61.0 days). Cellular and/or tissue-based

# The Impact of Endoform® on CTP Usage

## Clinical Evidence

### Technology Comparison

Endoform® is an advanced extracellular matrix (ECM) technology designed to aid soft tissue repair in acute and chronic wounds. Endoform® ECM technology is prepared via minimal processing of sheep forestomach tissue to remove only the sheep cells leaving an intact ECM that functions as a temporary scaffold for cell infiltration. Unlike traditional reconstituted collagen dressings, Endoform® is a native ECM and like other advanced scaffold technologies, Endoform® contains 150+ proteins that aid the tissue repair process.

Product	*Accessibility	Coll I	Coll III	Coll IV	Fibronectin	Elastin	Hyaluronic acid	Heparin sulphate	GAGs	Growth factors and cytokines	Basement Membrane	Residual Vascular Channels	Source tissue	Other components
Human tissue ECM	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-
Endoform® (1,2)	A-code (\$)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Ovine forestomach	None
Promogran™ (3,4,5)	A-code (\$)	✓											Bovine hide	Cellulose
Puracol® (3,6,7)	A-code (\$)	✓											Bovine hide	None
Fibracol™ Plus (3,8)	A-code (\$)	✓											Bovine hide	Calcium alginate
Cutimed® Epiona (5)	A-code (\$)	✓	✓										Bovine hide	Calcium alginate
Biostep™ (3,9)	A-code (\$)	✓											Porcine hide	Cellulose, alginate
OaSIS® (10)	Q-code (\$\$\$)	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	Porcine intestine	None
Epifix® (11,12,13,14)	Q-code (\$\$\$)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		Human amnion	None
Puraply™ (15)	Q-code (\$\$\$)	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	Porcine intestine	Crosslinked

(1) Lun, S., et al. (2010). A functional extracellular matrix biomaterial derived from ovine forestomach. *Biomaterials* 31(16): 4517-4529. (2) Dempsey, S. G., et al. (2019). Functional Insights from the Proteomic Inventory of Ovine Forestomach Matrix. *J Proteome Res* 18(4): 1657-1668. (3) Brett D. et al. A review of collagen and collagen-based wounds dressings. *Wounds* 2008;20:347-56. (4) Cullen et al. The role of oxidised regenerated cellulose/collagen in chronic wound repair and its potential mechanism of action. *The International Journal of Biochemistry & Cell Biology*. 34 (2002) 1544-1556. (5) Wiegand C et al. A novel native collagen dressing with advantageous properties to promote physiological wound healing. *J Wound Care*. 2016;25(12):713-720. (6) Karr J.C. et al. A Morphological and Biochemical Analysis Comparative Study of the Collagen Products, *Adv Skin Wound Care*. 2011, 24(5):208-16. (7) Puracol Safety Data Sheet, 5/28/2015. (8) Fibracol Plus Safety Data Sheet, version 1.0, October 2009. (9) Biostep Safety Data Sheet, June 9, 2009. (10) Badylak, S. F., et al. Extracellular matrix as a biological scaffold material: structure and function. *Acta biomaterialia* 5.1 (2009): 1-13. (11) Koob T. J., et al. Biological properties of dehydrated human amnion/chorion composite graft: implications for chronic wound healing. *Int Wound J*. 2013, 10(5):493-500 (12) Koob T. J., et al. Properties of dehydrated human amnion/chorion composite grafts: Implications for wound repair and soft tissue regeneration. *J Biomed Mater Res B Appl Biomater*. 2014, 102(6):1353-62 (13) Koob T. J. et al., Angiogenic properties of dehydrated human amnion/chorion allografts: therapeutic potential for soft tissue repair and regeneration. *Vasc Cell*. 2014, 6:10. (14) Koob T. J. et al., Cytokines in single layer amnion allografts compared to multilayer amnion/chorion allografts for wound healing. *J Biomed Mater Res B Appl Biomater*. 2015, 103(5):1133-40. (15) Fortaderm™ Antimicrobial PHMB Wound, FDA 510K Summary, K051647, 8 Nov 2005.

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\* Pricing is meant as a guide only. Pricing may differ based on institutional contracting.

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