

# Dressing Appearance at Change Can Give Insight into Dressing Effectiveness in the Wound

Susan Champion RN, CWOCN; Gregory Bohn, MD, FACS, ABPM/UHM, CWSP, FACHM  
West Shore Medical Center Wound and Hyperbaric Services, Manistee, MI

## Introduction:

Balancing wound requirements and making decisions on changing dressing materials are important in managing the dynamic healing of chronic wounds. Maintaining moisture, bioburden and protease levels are all important aspects of wound management.

Chronic wounds typically show high levels of certain matrix metalloproteinases (MMPs). These proteases sequentially degrade the native extracellular matrix, delaying wound healing. First, collagenases (MMP1 and MMP8) cause the initial breakdown of the vital ECM structure. Next, gelatinases (MMP2 and MMP9) further degrade the already-damaged ECM fragments into even smaller components. To reduce excess MMP activity, collagen dressings are utilized to act as a sacrificial substrate. This diverts the MMPs from degrading the patient's ECM to the ECM provided by the collagen dressing allowing the wound to progress<sup>1</sup>. Extracellular matrix participates in wound healing by providing structure for cellular signaling. Having visual cues to the process affected by the collagen can be helpful to the clinician in assessing the patient's wound response to treatment.

## Methods:

A collagen dressing with an intact extracellular matrix (CECM) was utilized to manage MMPs together with methylene blue / gentian violet polyurethane (GV/MB PU)\*\* antibacterial foam on four leg wounds. Visual observation of the wound surface, the dressing residue on the wound surface and amount of exudate were assessed at each dressing change.

## Conclusion:

Observations of the wound surface and dressings gave valuable insight into wound progression and guided the decision making process for future wound management strategies.

### References:

<sup>1</sup>Negron L, Lun S, and May BC, "Ovine forestomach matrix biomaterial is a broad spectrum inhibitor of matrix metalloproteinases and neutrophil elastase." International Wound Journal. (2012 Nov 1): 1-8.

\*Endoform dermal template, distributed by Hollister, Inc.

\*\*Hydrofera Blue Ready foam, distributed by Hollister, Inc.

### Observation:

- Minimal to no CECM dressing on wound bed
- High level of exudate, may indicate elevated level of protease activity

### Treatment:

- Two layers of CECM dressing, cover with GV/MB PU antibacterial foam.
- Case #1- CECM under NPWT

### Observation:

- Moderate amt. of CECM dressing on wound bed
- Moderate level of exudate, may indicate decreasing level of protease activity

### Treatment:

- Cleanse gently to remove remaining CECM. Continued with two layers of CECM dressing, cover with GV/MB PU antibacterial foam.

### Observation:

- Dry CECM dressing observed on wound bed
- Low level of exudate, may indicate protease balance

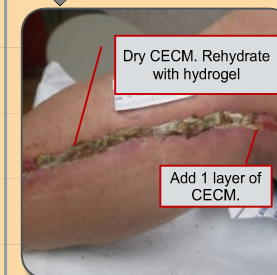
### Treatment:

- Leave dry CECM dressing. Add 1 layer of CECM dressing hydrated with hydrogel to open area, cover with GV/MB PU antibacterial foam.

Observation:  
Wound closed

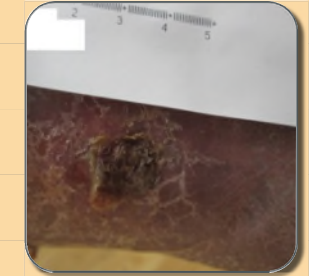
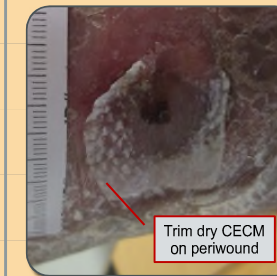
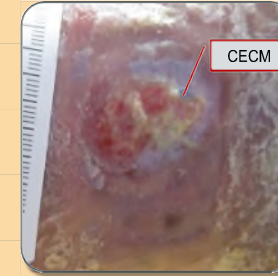
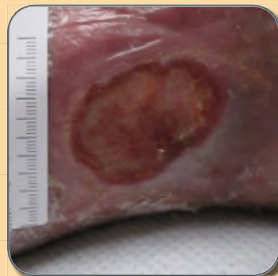
### Case Study # 1

- 68 year old male sustained trauma to right lower leg after being hit by motor vehicle.
- Developed MRSA post injury. Irrigation, debridement x 3 and placement of NPWT while hospitalized.
- History of: CAD, MI, COPD.
- Wound closed in 6 weeks.



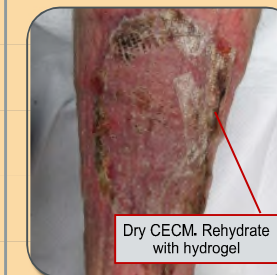
### Case Study # 2

- 59 year old male with non-healing wound to right leg for 12 years.
- Previous split thickness skin graft.
- History of HTN, venous insufficiency, diabetes.
- Wound closed in 31 weeks.



### Case Study # 3

- 58 year old male with non-healing wound on left calf for 2 weeks
- Wide excision and biopsy done. Pathology result showed hypervitaminosis D or calcium metabolism disorder.
- Split thickness skin graft
- Wound closed in 11 weeks.



### Case Study # 4

- 76 year old male with venous leg ulcer for a few weeks.
- Previous history of venous leg ulcers with prolonged healing.
- History of thrombocytopenia, renal insufficiency, HTN, hepatic encephalopathy and abdominal aortic aneurysm.
- Wound closed in 4 weeks.

