# Establishing an Emergency Department Protocol for Managing Trauma Wounds

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## Problem

4 adults and 1 pediatric patient presented with painful blistered trauma wounds managed in an emergency department (ED).

- Patient 1: right foot crush injury from dropping a heavy metal bar on his foot, affecting the 1st and 2nd toes.
- Patient 2: 2nd degree burn from a potato gun back-firing, affecting the right side of the face and around the eye.
- Patient 3: 2nd degree burns from a grease splatter, affecting the face near the eyes.
- Patient 4: (2 y.o.): 1st and 2nd degree burns affecting the hands and legs. She fell over her blanket into a burn pit of hot coals at a campsite.
- Patient 5: 2nd degree burns from spilt hot oil, affecting the right arm and hand. The patient slipped and fell carrying hot oil while working in a restaurant.

All patients' pain reported 3 to10 initially (0-10 scale). ED management included:
Patient 1 - standard Polymeric Membrane Dressings*, (PMDs) wrapped around the toes; Patient 5 - silver PMDs applied; Patients 2, 3 and 4 - silver sulfadiazine (SSD) applied.

## Rationale

PMDs help the body 1) resorb exudate from the closed blisters, 2) reducing edema and 3) absorbing open blister exudate while facilitating the body's natural healing abilities. The dressing helps reduce the dressing adherence to the wound bed. The dressings' ability to focus the inflammation response helps account for the observed reduced swelling, inflammation, pain, and bruising both at, and around, the injured areas. Silver PMDs have all the unique properties of the standard PMDs, while providing the necessary antimicrobial properties. The extra-absorbent PMD provides greater absorption, or longer wear time.

## Methods

After ED management, all were referred to, and seen within 3 days, at the outpatient wound clinic. SSD was removed to: 1) help reduce patients' wound pain; 2) reduce known SSD risks associated with possible ingestion (Pt 4), plus eye and mucosal damage risks (Pts 2,3,4). Silver PMDs were applied at least 2 cm beyond the surrounding inflamed skin to help decrease periwound inflammation, swelling and complications, while helping improve perfusion of injured tissues. No further manual cleansing was required after initial removal of SSD, as PMDs provide continuous cleansing.

PMDs selected: Patient 1 - silver finger/toe; Patient 2 - mask made from silver extra-absorbent and secured with stretch gauze; Patient 3 - silver; Patient 4 - silver extra-absorbent; and, Patient 5 - silver extra-absorbent. Dressings were secured with tape, stretch net gauze, gauze wrap and or compression. Dressing changes were decreased to every 2 to 3 days with PMDs from 2x to 3x per day with SSD.

## Results

All wounds reached closure with PMDs. Pain was reduced to 0 to 3 for all patients. Reduced frequency of PMD changes and minimized disruption of the wound bed. PMDs facilitated blister resorption, debridement and reduced scarring. There was very little discoloration, such as scarring or change in skin color.

Patients rapidly resumed their normal activities:

**Patient 1** went back to work after 1 week when able to get his shoe on.

**Patient 2** refused to be seen in public after his burn trauma, but after only one week of PMDs the burns were superficial and almost closed. The patient attended prom and was in a wedding.

**Patient 3** went back to college classes after dressings were removed.

**Patient 4 (2 y.o.)** was no longer in emotional distress, stopped crying. Within 2 days, allowed the dressings to be changed and started to resume playing.

**Patient 5** went back to work within a week with a cover over the arm and hand for protection.

## Conclusions

PMDs provided an optimal healing environment. Patients and family found PMDs easy to change. PMDs are now the standard protocol of care in the ED.

### Emergency Department Protocol with Polymeric Membrane Dressings

**Burn Protocol**

Follow the Burn Stabilization Protocol from St. Elizabeth's Hospital in Lincoln Nebraska, on the larger burn injuries and prepare for transport to that facility. Call the Burn Center regarding appropriate treatment.

**Minor Burn Protocol for:** Partial thickness burns in a small area 1-9% of Total Body Surface Area (TBSA). Anything more than 10% TBSA should be referred to the Burn Center.

1. Preferred treatment is to leave the blisters intact and cover with Polymeric Membrane Dressing (PMD) extra-absorbent silver (writing side out) then wrapped loosely with gauze wrap which is held in place with surgical netting.
2. PMD can stay in place for up to 3 days. Research has shown it to:
   a. Decrease pain
   b. Decrease swelling, redness and scarring
3. Refer patient for follow-up to wound care as soon as possible, but 3 days maximum.

**NOTE: Prefer Silver Sulfadiazine (SSD) not be used. Never apply SSD near the eyes as it can cause blindness.**

**Protocol for Wounds In the ED**

Supplies needed: Saline OR hypochlorous acid wound cleanser, OR soap and water. Standard polymeric membrane dressing (PMD); it should be at least 2 cm's bigger than the wound itself. Skin barrier, gauze wrap and cloth conformable tape to secure dressing.

Steps for initial wound treatment on all wounds:

1. Be sure to measure and document.
2. Clean the wound carefully with soap and water OR saline OR hypochlorous acid wound cleanser. Pat dry.
3. Apply skin barrier wipe to the surrounding skin where adhesive tape will be applied to prevent medical adhesive-related skin injury, and let dry.
4. If skin is very thin or fragile you can skip this step and wrap the PMD in place with a gauze wrap and secure with tubular elastic bandage Do NOT apply tape to thin fragile skin. Use gauze wrap instead.
5. Tape the PMD in place with the tape.
6. Please notify an in-house wound team member to check the dressing as soon as possible for further evaluation and treatment. Or, refer to wound clinic for follow-up within 3 days of ED visit.
7. Dressings should be changed every 24 hours or if strike-through drainage is noted until wound care changes order. Contact the wound care department for further follow-up care.

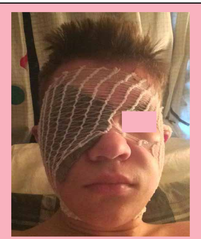
**Patient 1: with PMDS wrapped around the toes in ED**
Silver finger/toe PMDs implemented same day as seen in ED

**7 days after initial application of PMDs.**

**12 days after initial application of PMDs**

**Wound closure 31 days**

**Patient 2: Before PMDs with SSD in ED**
Photos taken by patient.



**1 day after being seen in ED, silver extra-absorbent PMDs applied**

**6 days after initial application of PMDs, wounds almost closed**

**Wound closure in 14 days**

**Patient 5: Silver PMDs applied in the ED**
Photo taken day of injury, by patient.

**3 days after being seen in the Emergency Department**
Silver extra-absorbent PMDs applied with a gauze wrap and compression.
2nd photo taken in the wound clinic by the poster author.

**8 days after initial application of PMDs wound is closed**
PMDs were continued 7 days after closure in order to protect the new skin growth.
Photo taken 15 days after initial application of PMDs.

**Patient 3: Before PMDs**
Photo 3 days later when SSD applied.

**With silver PMDs- Wound closure in 5 days**
Moisturizer used after closure to keep skin moist.

*PolyMem® Dressings, PolyMem Max Silver®, PolyMem® finger/toe Silver Dressings, are made by Ferris Mfg. Corp., 5133 Northeast Parkway, Fort Worth, TX 76106 USA
1-800.POLYMEM (765.9636) • www.polymem.com • This case study was unsponsored. Ferris Mfg. Corp. contributed to this poster presentation.

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