Improving Deep Tissue Pressure Injury (DTPI) outcomes: a 2.5 year-long Quality Improvement Project Autumn Henson DNP, APRN-BC, GNP, WCC, Trinity Elms Health & Rehab,7449 Fair Oaks Drive, Clemmons, NC 27012 and Trinity Glen 849 Waterworks Road, Winston Salem, NC 27101

PROBLEM

Long-term care facility (LTCF) residents with multiple co-morbidities, debility and cognitive loss are at higher risk of developing deep tissue pressure injury (DTPI). There is limited research supporting the treatment options for DTPIs, but offloading is recommended. Two affiliated LTCFs wanted to implement a different wound management approach to decrease wound inflammation and prevent deterioration of DTPIs.

RATIONALE

Polymeric Membrane Dressings* (PMDs) were applied because the dressings, applied to the skin, localize the inflammatory reaction to the actual zone of injury in the epidermis, dermis and deep tissues. PMDs reduce the spread of secondary injury, including edema and swelling, into the surrounding tissue. This unique approach helps to reduce the DTPI response as well as encourage injury resolution for intact and open DTPIs. On open wounds, PMDs' continuous cleansing system maintains a clean wound bed while enhancing autolytic debridement, usually eliminating cleansing during dressings changes.

METHODS

A Quality Improvement Project was initiated: a retrospective chart analysis of wound management of the last 2.5 years was conducted. One hundred four **DTPIs were included in the 2.5 year analysis and combined over two phases.** Two groups were studied with lower extremity DTPIs on the toe, ankle, foot and heel. Both groups included proper offloading.

The first phase of the evaluation compared PMDs and Skin Barrier Film (SBF). There were two groups; the first group signed consent for new PMD DTPI management and then the second group continued with the use of SBF DTPI management. PMDs showed positive outcomes, so PMDs were continued as the main treatment in the LTCFs. The second phase retrospectively compared the previous SBF use to the PMD use in the 2.5 year period of time.

Group 1) 36 patients with 40 DTPIs. SBF was applied 2x/day. Group 2) 49 patients with a total of 64 DTPIs. PMDs were changed 2x/wk. and as needed. Lost to follow-up: SBF= 13 (32.5%); PMD=25 (39%). Final analysis was performed on those not lost to follow-up: 27 in SBF group and 39 in PMD group. Patients lost to follow-up were discharged before resolution or died unrelated to their wound.

RESULTS

DTPI Management outcomes	Group 1 SBF (27 DTPI)	Group 2 PMD (39 DTPI)
Opened total	85.2% (23)	33.3% (13)
Opened as Stage 2	11.1% (3)	2.5% (1)
Opened as Stage 3	33.3% (9)	18% (7)
Opened as Stage 4	40.7% (11)	12.8% (5)
Did not open & resolved	14.8% (4)	66.7% (26)

⁺Some DTPI opened at the "blistering phase" from epidermis to dermis and never progressed further. The stage at which the tissue opens depends on the evolution of the wound, which is influenced by pressure reduction and management.

OUTCOMES WITH ISCHEMIC LOWER LIMB DTPI

PMDs improved outcomes even in patients with moderate to severe lower extremity arterial disease. PMDs control inflammation and edema. This feature of PMDs could account for their dramatically superior ability to resolve DTPIs without opening, even in patients whose circulatory status to their lower legs is compromised.

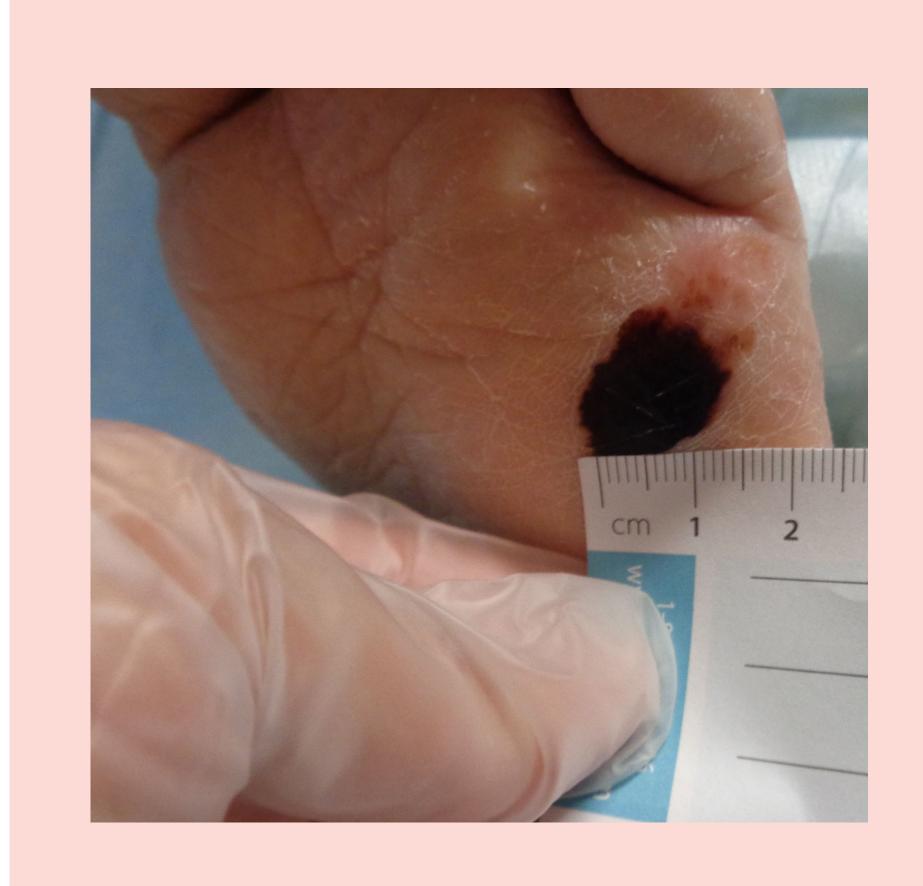
DTPI Outcomes for Moderate to Severe Lower Extremity Arterial Disease	Group 1- SBF	Group 2- PMD
Opened	83.3%	45%
Did Not Open	16.6%	55%
	100%	100%

For the patients in both groups, the author found that the most frequent risk factor/common comorbidities predictive of DTPI were: weight changes, cardio vascular/artery disease, peripheral vascular disease and anemia. PMDs proved valuable in the LTCFs where there is higher risk level of debilitation of patients and increase in co-morbidities.

WOUND CARE TIME

In SBF group, nursing wound care time required to manage the DTPIs was 70 minutes/patient/week; in the PMD group 20 minutes/patient/week was required.

PMDs saved nursing wound care time by 50 minutes/patient/week.



Left Foot, Plantar DTPI

DTPI developed from pressure of heel lift boot

Intact, Deep Maroon Colored **Deep Tissue Pressure Injury**

Polymeric Membrane Dressing Applied

Measurement: 1 x 1 x 0 cm



In 28 days, **DTPI Resolved with PMDs**

The damaged epidermis peeled off with the PMD, leaving no tissue damage.

CONCLUSION

Overall, DTPIs managed with PMD were 4.5 times more likely to resolve spontaneously (never opening) compared to those managed with SBF. DTPIs on ischemic limbs were 3.3 times more likely to resolve spontaneously (never opening) when managed with PMDs. There was faster resolution with DTPI that opened with PMDs. PMD managed DTPIs provided better outcomes while requiring the investment of 71% less DTPI management staff time. The nursing staff found the dressing very easy to use. There is a significant cost savings with resolution of DTPIs which never open, because the cost of wound management of an open wound is eliminated. PMDs have become the standard of care managing DPTIs in the two LTCFs.

Definition of Deep Tissue Pressure Injury

"DeepTissue Pressure Injury: Persistent non-blanchable deep red, maroon or purple discoloration Intact or non-intact skin with localized area of persistent non-blanchable deep red, maroon, purple discoloration or epidermal separation revealing a dark wound bed or blood filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin. This injury results from intense and/or prolonged pressure and shear forces at the bone-muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury, or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a full thickness pressure injury (Unstageable, Stage 3 or Stage 4). Do not use DTPI to describe vascular, traumatic, neuropathic, or dermatologic conditions."¹

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