Study First: Driving the Case for Improving Hospital Wound Care

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Health ONE Rose Medical Center

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Problem:

In our acute care setting, the Wound Team found that the silicone bordered foam wound dressings on formulary used to manage topical wounds had poor absorption and required frequent dressing changes. Peri-wound maceration, aggressive adhesion, tissue stripping and painful dressing changes were also noted. Wound clinicians and clinical nurses were dissatisfied. We wanted to change the formulary dressing; however, our Materials Management colleagues vetoed our recommendations based on a perceived increased cost of the desired products.

Setting:

Rose Medical Center is a 250 bed community hospital in Denver, CO. Our patient population includes a large number of elderly admissions from nursing homes.

Method:

Prior to requesting a change in the bordered foam dressing on formulary, we initiated a Quality Improvement Project (QIP) to gather data documenting its actual performance. We then compared the performance of the formulary dressing to a soft silicone bordered foam dressing with Flex technology (intervention dressing).

All patients consulted by the WOC Nurse with a wound that did not require a filler were eligible for inclusion.

WOC Nurse Role: In our hospital, visual assessment of patients' wounds were conducted every shift. Routine dressing changes were per WOC Nurse order, generally every 5 days and whenever necessary. For the QIP, the clinical nurse wound assessment every shift was eliminated. The WOC nurse amended the protocol to change the dressings of enrolled patients every 3 days until discharge from the hospital to assess the wound and measure its healing progress (defined as % change in area or volume as measured by length x width x depth) as well as to evaluate the dressing's ability to absorb and stay in place. Incidents of peri-wound maceration, medical adhesive-related skin injury and silicone residue deposited on skin or wound bed were documented. Patients were asked to rate their pain level at dressing change from 1 (none) to 5 (severe).

For each enrolled QIP patient, the WOC Nurse placed a packet containing extra dressings and a clinical nurse survey at the bedside.

Clinical Nurse Role: Clinical nurses on each unit were in-serviced on the QIP protocol. When dressings needed to be changed outside of the every-3-day protocol, the nurses utilized the dressings in the packet at the bedside and completed a survey to document the reason for the dressing change.

Supply Utilization: Either the formulary or intervention dressings were supplied in packets at the bedside depending on which phase of the QIP was in progress. This controlled dressing utilization and enabled an accurate dressing count.

IRB Approval: This project was submitted to the Institutional Review Board and approval is pending at time of poster printing.

Process:

The evaluation occurred from October 2018 through March of 2019. First, 18 patients with 39 wounds were managed using the dressing on formulary, followed by 14 patients with 40 wounds receiving the intervention dressing.

Clinical Results:

WOC Nurse Assessment

Pressure injuries and venous leg ulcers were the most common wounds managed during this QIP, so we calculated percent reduction in area or volume for these wounds only; they were the wound types with sufficient numbers in both groups to enable a comparison.

For pressure injuries, the intervention dressing supported a 57.5% reduction in wound area or volume with the intervention dressing, compared to a 0.4% reduction for the formulary dressing. For venous leg ulcers, a 44.6% reduction in wound area or volume compared favorably to 12.8% with the formulary dressing. **See Table 1.** *Healing Rates of Pressure Injuries and Venous Leg Ulcers.*

The average patient rating of pain at dressing change was 3.5. Of those patients able to respond, 53% noted moderate or severe pain for the formulary dressing. For a tally of episodes of leaking, maceration, silicone residue and lifting of the dressing, **See Table 2**. *WOC Nurse Dressing Performance Assessment Results*.

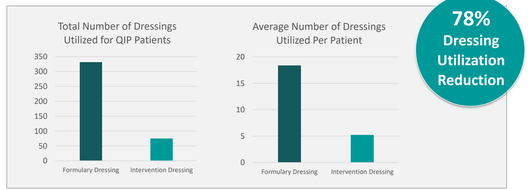
See **Figure 1.** *Formulary Dressing* and **Figure 2**. *Intervention Dressing* for images showing different adhesion and conformability

Clinical Nurse Surveys: Reasons for Dressing Change

A large majority of the 97 nursing surveys collected on the formulary dressing indicated that the reason for the dressing change was nonadherence, leaking and saturation. Maceration and moderate or severe pain at dressing change was also indicated.

In the 2 dressing change surveys collected for the intervention dressing, no leaking or nonadherence were noted. The intervention dressings were removed for showering, and evidence of complete wound closure.

Figure 3. *Dressing Utilization Data*



Economic Results:

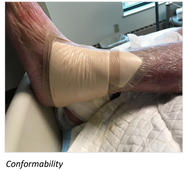
Dressing Utilization

The 18 patients with 39 wounds that received the formulary dressing experienced 331 dressing changes during their hospitalization; an average of 8.5 dressings / wound and 18.4 dressings / patient. The 14 patients with 40 wounds in the group utilizing the intervention dressing received 73 dressing changes during their hospital stay, an average of 1.8 dressing/wound and 5.2 dressings per patient. A total of 258 less dressing changes and a 78% reduction in dressing utilization occurred between the formulary dressing and the intervention dressing. When cost in use as opposed to unit price is calculated, the cost of the dressings was $955 less for the 40 wounds in the intervention group than the cost of the dressings for the 39 wounds in the formulary group, a 74.2% cost reduction. **See Figure 3.** *Dressings Utilization Data* and **Figure 4**. *For the Nurse Leader*

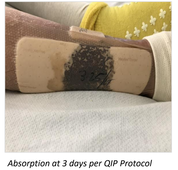
Figure 1. *Formulary Dressing*

Premature Detachment

Figure 2. *Intervention Dressing*



Conformability



Absorption at 3 days per QIP Protocol

Table 2. *WOC Nurse Dressing Performance Assessment Results*

Important Dressing Performance Factors[2,9]	FORMULARY DRESSING 18 patients | 39 wounds	INTERVENTION DRESSING 14 patients | 40 wounds
Promotes Undisturbed Wound Healing		
Reduction in wound area or volume over hospitalization	See Table 1	
Barrier to Environmental Pathogens Ability to Stay On		
Not Adhering* / Coming Off	19 Episodes	0 Episodes
Conformability to anatomy Average rating	3.5 (moderately conformable)	1 (very conformable)
Support Balanced Moist Wound Healing Absorption		
Leaking Exudate	16 Episodes	0 Episodes
Periwound Maceration	14 Episodes	0 Episodes
Undisturbed Wound Healing Longer Wear Time[9]		
Average number of days' wear time	Less than One Day per Dressing	3 Days per QIP protocol
Undisturbed Wound Healing Atraumatic Removal		
Pain on removal Average Rating No discomfort to Severe discomfort	3.5 (Moderate discomfort)	1.3 (Minimal discomfort)
Comfort during wear Average Rating No discomfort to Severe discomfort	1.6 (Mild Discomfort)	1 (No Discomfort)
Epidermal Stripping	4 episodes	0 episodes
Silicone residue	Moderate to Large amount: 32	None
Ease of Use		
WOC Nurse Rating	1.1 (Very Easy)	1 (Very Easy)

Table 1. *Healing Rates of Pressure Injuries and Venous Leg Ulcers*

	FORMULARY DRESSING Percent Total Healing 11 Patients / 28 wounds		INTERVENTION DRESSING Percent Total Healing 11 Patients / 28 wounds	
Pressure Injuries	Initial Area **17.2 cm²** Average	**0.4%** Average 6.5 days	Initial Area **35.4 cm²** Average	**57.5%** Average 4.6 days
Venous Leg Ulcers	Initial Area **41.6 cm²** Average	**12.8%** Average 7 days	Initial Area **20.5 cm²** Average	**44.6%** Average 3 days
Number of Wounds that Enlarged	**2** Range 14 to 150%		**2** Range 4.2 to 9.8%	

Figure 4. *For the Nurse Leader*

Clinical Leadership Alert:
Estimated Nurse Time for Wound Care during this QIP*

27.6 Hours	Hours of nursing time for wound care with the formulary dressing
6.1 Hours	Hours of nursing time for wound care with the intervention dressing
21.5 Hours	Fewer hours of staff nursing time with the intervention dressing
$633.39	Reduction in labor costs in this QIP**

Clinical Nurse Tasks Associated with Dressing Changes in Acute Care[11]

- Travel to supply room
- Travel to patient room
- Dressing removal and application
- Wound assessment
- Wound cleansing
- Patient education
- Documentation of assessment, intervention and education

* Estimates based on 5 minutes per wound dressing change which is less than ½ the published time estimates of 10.5-13.9 minutes per dressing change. Number of dressings utilized = a dressing change. Formula: Number of dressings x 5 minutes per dressing change divided 60 minutes per hour.
** At an average salary of $29.46 / hour [12]

Discussion

The number of patients in acute care having at least 1 wound is estimated at 19-52% world-wide, an indication that wound care is a common issue in the acute care environment.[1,9]

The choice of topical dressing is an important decision in the management of acute-care wounds. There is consensus on the attributes of the ideal dressing.[2] **See Table 2**. *WOC Nurse Dressing Performance Assessment Results*

Factors Affecting Dressing Performance

Evidence-based wound care requires review of published clinical evidence, critical evaluation of the products in use and periodic evaluation of new technologies when available.[2] The predicate version of the intervention dressing has 70 studies evaluating the performance of its silicone technology to prevent trauma and pain on removal, its ability to absorb exudate and to maintain a moist wound environment.[3] The intervention dressing exhibited excellent absorption. Additionally, its conformability was remarkable. Better conformability enabled secure adhesion to joints and difficult-to-dress anatomy, plus ability to stay in place for a minimum of 3 protocol days. Data collected for this QIP tends to corroborate the findings of extended wear times demonstrated for skin tears with the intervention dressing.[4]

The Impact of Dressing Performance

Clinical Outcomes

We were surprised by the low percentage of wound healing calculated for the formulary dressing. We suspect that the frequent dressing changes needed due to low absorption and faulty adhesion contributed significantly to this. The longer wear time of the intervention dressing which enabled undisturbed wound healing may have contributed to the more robust wound healing calculated for the intervention group.

Economic Impact

Foam dressings for wound management can be the largest spend for wound treatment in the acute care setting.[5] Dressing construction influences the effectiveness of a dressing which in turn directly impacts the number of dressings used and ultimately the cost of topical wound care.[6,7] We wanted a single dressing that would meet the needs of different wound types and different patients. The availability of the new Flex technology made this possible. Reducing the number of dressing changes, products and dressing combinations makes wound care protocols less complex, to the benefit of clinical nurses as well as Clinical and Health Economic decision-makers.[6] The 78% reduction in the dressing utilization for the intervention dressing was clearly beneficial for all stakeholders.

The results of this QIP demonstrate that higher unit price for the intervention dressing was more than compensated by its actual performance in real time versus the performance of the formulary dressing.

Although not always considered when selecting formulary dressings, the amount of time that hospital staff nurses spend providing wound care ranges from 10.5 to 13.9 minutes per dressing change as documented in the literature.[1,8] **See Figures 4**. *For the Nurse Leader*

Quality Improvement in Wound Care

In order for nurses to own their outcomes and take responsibility for making process of care improvements, skill in collecting, evaluating, analyzing and acting on outcome data is essential.[10] Wound care is a major source of hospital resource utilization, however a lack of knowledge about the impact that wounds have on the patient, the staff and the acute care facility leads to a lack of focus on improving quality and efficiency.[7] Wound Care Program Managers, who are entrusted to safeguard the interests of patients with wounds, must apply principles of quality improvement and evidence-based practice in guiding their organizations in the selection of the formulary dressing.[2]

Measuring the impact of the formulary dressing on the patient's quality of life and clinical nurses' time as well as the clinical and economic improvements noted with the intervention dressing was a key first step in substantiating our request to change to a superior wound management product.

Conclusion

We translated our empirical clinical observations into measurable data and used these data as a baseline to quantify our quality improvement efforts. The results of this QIP demonstrated that the perceived increased cost for use of the intervention dressing was inaccurate based on the actual cost of the dressings utilized. Additionally, the significant impact of the improved performance of the intervention dressing over the formulary dressing was quantified.

Patients receiving the intervention dressing experienced considerably less pain at the 258 fewer dressing changes. For pressure injuries the intervention dressing supported a 57.5% reduction in wound area or volume compared to a 0.4% reduction for the formulary dressing. For venous leg ulcers, a 44.6% reduction in wound area compared favorably to the 12.8% reduction with the formulary dressing. No maceration, leaking or silicone residue was noted with the intervention dressing as opposed to the considerable amounts noted with the formulary dressing.

Economic results included a 78% reduction in utilization of intervention dressing as comparted to formulary dressing, which resulted in a $955 cost reduction for the 32 patients enrolled in this QIP.

This evidence of improved patient outcomes and the impact of product quality on patient care and satisfaction will be presented to Leadership and Purchasing in justifying our request to change to the new soft silicone bordered foam dressing with Flex technology for topical wound management.

Limitations

This was a Quality Improvement Project and not a controlled study. Due to lack of data, we only compared venous leg ulcer and pressure injury reductions in wound area or volume in this QIP, were not able to randomize patients or match patient diagnoses, comorbidities and demographics. Future projects are needed to amend these limitations, and others.

References

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Product reference and manufacturer information: Mepilex® Border Flex by Mölnlycke Health Care US, LLC. Norcross, GA 30092.
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