

# Utilization of Monofilament Debridement in Conjunction with Enzymatic Debridement for Removal of Devitalized Tissue: A Cost Effectiveness and Benefit Analysis

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## Introduction

"The term 'debridement' means the removal of dead or necrotic tissue or foreign material from and around a wound to expose healthy tissues" (White, 2015). According to the European Wound Management Association, "Debridement is a basic necessity to induce the functional process of tissue repair, [it is] a central medical intervention in the management of acute and chronic non-healing wounds" (Strohal et. al., 2013). There are several reasons that debridement is essential, and evidence-based practice reveals early debridement intervention is most appropriate. These reasons include, but are not limited to reducing wound bioburden and biofilm and reducing wound odor (Vowden and Vowden, 1999a, Wolcott et al, 2009). Debridement also allows for better absorption and action of preparations applied topically, allows for better wound visualization and assessment, and reduces time to healing via shortened inflammatory phase (Baharestani et. al., 1999, Benbow, 2008, Weir, 2007).

## Methods

The researchers used 2 arms (n= 15 in each arm) for the study to compare the use of ED alone in one arm and MFD+ED in the second arm. The study timeframe was 8 weeks. Weekly wound measurements were done and MFD was done with dressing changes done by researchers. At the end of the 8 week period of time, the wound size and NT data was collected and reviewed to determine results.



Left arm skin tear with healing progression using MFD+ED

## Procedures



The images above depict the same wound just before and just after MFD on the same day. The images to the right are the same wound throughout the healing phase.

Measurements were collected once weekly during multi-disciplinary wound rounds. Wound assessment of necrotic tissue and size were determined by one researcher in order to retain intra-rater reliability.

Limitations of the study include the nature of the practice setting caused some patients to be discharged from SNF or acute care before wound epithelialization or resolution.

## Cost/Benefit Analysis

1. Reduce costs by discontinuation of ED more quickly related to absence of NT
2. Reduced costs related to nursing time for dressing changes related to faster wound epithelialization
3. Reduced costs related to dressing materials related to faster healing times
4. Increased patient satisfaction related to less painful debridement and faster results
5. Potential decreased time in SNF or Acute Care setting
6. Reduced risk of bioburden and infection related to MFD and faster healing times.
7. Provider satisfaction related to ease of use and reduced wound healing times/better outcomes.

## Results

	ED	MFD + ED
% Wound size reduction	22%	23%
NTSA overall reduction	22%	49%
NTSA comparative reduction	9%	34%
Number of days	7.84 days	4.53 days



Cost/Benefit Analysis	MFD + ED
Nursing time	Reduced \$167/wk
Dressings and supplies	Reduced \$251/wk
Risk for bioburden & infection	Reduced \$11,000 - \$35,000
Removal time for NT	Reduced
Time to wound epithelialization	Reduced \$5,904 - \$21,410 cost/ulcer
Length of stay	Potentially reduced \$1,731/day (avg 4-10 days)
Patient satisfaction	Increased - affected by reimbursement withholding 1%
Provider satisfaction	Increased

## Conclusion

Based upon the results when comparing both arms, there is a statistically significant difference in removal of devitalized tissue from the wound bed. This necrotic tissue reduction was also noted in fewer days than when using enzymatic debridement alone. This study should allow wound care providers to examine our practice and consider the use of monofilament debridement when treating wounds that contain devitalized tissue in order to reduce necrotic tissue, decrease the time needed for healing, decrease healthcare costs and nursing time spent in dressing changes.

## References

- Baharestani M, Gottrup F, Holstein P, Vanscheidt W (eds) (1999) *The Clinical Relevance of Debridement*. European Tissue Repair Society, Oxford
- Benbow M (2008) Debridement and the removal of devitalized tissue. *J Community Nurse* 22(12): 11-16
- Moreno Smith, C. (2015). Cochrane Review Summary. Debridement for Surgical Wounds. *Critical Care Nurse*, 35(4), 75-76. 2p. doi:10.4037/ccn2015658
- Strohal, R., Apelqvist, J., Dissemont, J. et al. EWMA Document: Debridement. *J Wound Care*. 2013; 22 (Suppl. 1): S1-S52.
- Vowden P, Vowden KR, Carville K (2011) Antimicrobials made easy. *Wounds Int* 2(1): <http://tiny.cc/383t9> (accessed 8 August 2011)
- Weir D, Scarborough P, Niezgodna JA (2007) Wound debridement. In: Krasner DL, Rodeheaver GT, Sibbald RG, eds. *Chronic Wound Care: A Clinical Source Book for Healthcare Professionals*. 4th edn. HMP Communications, Malvern: 335-47
- White, R. (2015). The costs of wound debridement and exudate management. *British Journal Of Healthcare Management*, 21(4), 172-175 4p.
- White, W. (2011). Sharp wound debridement in the management of recalcitrant, locally infected chronic venous leg ulcers: A narrative review. *Wound Practice & Research*, 19(4), 222-228 7p.
- Wolcott RD, Kennedy JP, Dowd SE (2009) Regular debridement is the main tool for maintaining a healthy wound bed in most chronic wounds. *J Wound Care* 18(2): 54-6
- <http://kff.org/other/state-indicator/expenses-per-inpatient-day/>
- [http://www.leafhealthcare.com/pdfs/LH\\_WP\\_FinancialOverview\\_1563AA\\_PDF\\_100514.pdf](http://www.leafhealthcare.com/pdfs/LH_WP_FinancialOverview_1563AA_PDF_100514.pdf)
- <http://www.greenkeytlc.com/blog/high-cost-nursing-turnover/>
- [http://www.cdc.gov/HAI/pdfs/hai/Scott\\_CostPaper.pdf](http://www.cdc.gov/HAI/pdfs/hai/Scott_CostPaper.pdf)