TITLE: Non-Surgical Debridement for Chronic Lower Extremity Wounds: Clinical Effectiveness and Guidelines

DATE: 05 December 2013

RESEARCH QUESTIONS

1. What is the clinical evidence regarding the effectiveness of non-surgical debridement for the treatment and management of chronic, lower extremity wounds?

2. What are the evidence-based guidelines regarding the use of non-surgical debridement for the treatment and management of chronic, lower extremity wounds?

KEY MESSAGE

Five systematic reviews, three randomized controlled trials, eight non-randomized studies, and nine evidence-based guidelines were identified regarding non-surgical debridement for the treatment and management of chronic, lower extremity wounds.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 10), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2009 and November 20, 2013. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

Five systematic reviews, three randomized controlled trials, eight non-randomized studies, and nine evidence-based guidelines were identified regarding non-surgical debridement for the treatment and management of chronic, lower extremity wounds. No relevant health technology assessments were identified. Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

Of the systematic reviews, randomized controlled trials, and non-randomized studies that discussed debridement techniques, maggot debridement therapy (MDT), enzymatic therapy, hydrogels, and other newer methods were examined. The majority of studies examining MDT observed it to be a simple and effective debridement technique to treat chronic lower extremity wounds with the ability to work quickly in the first week of treatment, reduce wound areas, and reduce debridement time. MDT was not observed to significantly increase the rate of healing in one RCT and was associated with pain throughout treatment cycles in one NRS.

The following methods were also observed to be effective in treating lower extremity chronic wounds: hydrogels (increased healing rates in one RCT), enzymatic therapy (equivalent to saline moistened gauze in one RCT), Debrisoft (efficacious simple procedure in one NRS), and Woundcare 18+ (increased healing incidence and desloughing and associated with lower incidence of wound infection when compared to hydrogel in one NRS). Table 1 includes specific information and conclusions from the included studies.

The nine evidence-based guidelines identified produced the following recommendations on debridement techniques:

- Hydrocolloidal dressings
  - reduced pain associated with its use
  - improves healing when compared to gauze
- Hydrogels
  - may use topical hydrogel dressings in non-ischemic, non-healing dry wounds with non-viable tissue
- MDT
  - bagged or loose MDT debrides faster, with similar healing properties of hydrogel, but can be more painful
  - medical grade maggots are required
  - qualified personnel are required
  - can also be used when conventional treatment is not working
  - can be used in wounds where surgical debridement cannot be performed
- Mechanical/Sharp
  - best at removing tissue or eschar in non-ischemic wounds
removes non-vital tissue and slough\textsuperscript{24}
- less painful\textsuperscript{24}
- faster progression with the use of eutectic mixture of local anesthetics (EMLA) cream.\textsuperscript{24}

It was recommended that debridement techniques should be determined based on the condition and location of the wound\textsuperscript{20,23,25}, its vascularity, the presence of biofilms and/or infection, the amount of necrotic tissue,\textsuperscript{20} patient preference, and the clinician’s expertise and experience.\textsuperscript{23,25}

Two guidelines specified that only physicians with adequate training in wound debridement were recommended to perform the procedures, particularly when they become extensive.\textsuperscript{19,23} In addition, clinicians adept in wound debridement should be consulted by less qualified clinicians should the need arise.\textsuperscript{19} Pain management strategies were recommended for the pain associated with ulcer debridement and included the administration of EMLA cream\textsuperscript{21,24} and ibuprofen-containing foam dressings.\textsuperscript{24}

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Patient Condition(s)</th>
<th>Debridement Type(s)</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic Reviews and Meta-Analyses</td>
<td></td>
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<tr>
<td>Tian et al. 2013\textsuperscript{1}</td>
<td>DFU</td>
<td>MDT</td>
<td>● Evidence was too weak to routinely recommend MDT.</td>
</tr>
<tr>
<td>Game et al. 2012\textsuperscript{2}</td>
<td>DFU</td>
<td>Sharp, bed prep with larvae, and hydrotherapy</td>
<td>● Difficulties with analyzing evidence due to poor methodology and lack of controlled studies.</td>
</tr>
<tr>
<td>Hoppe et al. 2012\textsuperscript{2}</td>
<td>NA</td>
<td>NA</td>
<td>● NA\textsuperscript{a}</td>
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<tr>
<td>Edwards et al. 2010\textsuperscript{4}</td>
<td>DFU</td>
<td>Hydrogels, MDT, surgical</td>
<td>● Hydrogel increased healing rates compared with gauze dressing/SOC. ● MDT significantly reduced wound area compared to hydrogel.</td>
</tr>
<tr>
<td>Ramundo et al. 2009\textsuperscript{5}</td>
<td>Cutaneous ulcers and burn wounds</td>
<td>Enzymatic (collagenase)</td>
<td>● Collagenase ointment was safe and effective for cutaneous ulcers and burn wounds.</td>
</tr>
<tr>
<td>Randomized Controlled Trials</td>
<td></td>
<td></td>
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<tr>
<td>Tallis et al, 2013\textsuperscript{6}</td>
<td>DFU</td>
<td>Enzymatic (CCO) vs SMG + selective sharp</td>
<td>● CCO was equivalent debridement to SMG. ● CCO found to foster better progress toward healing.</td>
</tr>
<tr>
<td>Opletalova et al. 2012\textsuperscript{7}</td>
<td>Leg wound</td>
<td>MDT vs conventional treatment</td>
<td>● MDT treatment was significantly faster and occurred in the first week of treatment. ● No significant benefit at day 15 when compared to conventional treatment. ● Suggested that another dressing should be used after 2-3 MDT applications.</td>
</tr>
<tr>
<td>Dumville et al. 2009\textsuperscript{8}</td>
<td>Leg ulcers (either venous or venous/arterial)</td>
<td>MDT (loose larval or bagged larval) vs hydrogel</td>
<td>● MDT significantly reduced debridement time. ● MDT did not significantly...</td>
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Table 1: Summary of the Clinical Effectiveness of Different Types of Wound Debridement

<table>
<thead>
<tr>
<th>Author, Year</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Igari et al. 2013&lt;sup&gt;9&lt;/sup&gt;</td>
<td>PAD</td>
<td>MDT</td>
<td>● MDT was not as beneficial for patients with an ABI lower than 0.6.</td>
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<td></td>
<td></td>
<td></td>
<td>● Other patient and therapy characteristics did not appear to contraindicate the use the MDT.</td>
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<tr>
<td>Gilead et al. 2012&lt;sup&gt;10&lt;/sup&gt;</td>
<td>Leg wounds (48% DFU)</td>
<td>MDT</td>
<td>● MDT was found to be effective, safe, and simple for the treatment of chronic wounds in ambulatory and hospitalized patients.</td>
</tr>
<tr>
<td>Mumcuoglu et al. 2012&lt;sup&gt;11&lt;/sup&gt;</td>
<td>Leg wounds (48% bFU)</td>
<td>MDT</td>
<td>● MDT found to cause pain throughout treatment cycle and authors recommended that analgesics (including opioids when indicated) need to be available and titrated.</td>
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<tr>
<td></td>
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<td>● Authors suggested that peripheral nerve blocks should be considered for patients who are uncontrolled on systemic medications.</td>
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<tr>
<td>Bahr et al. 2011&lt;sup&gt;12&lt;/sup&gt;</td>
<td>Chronic wounds</td>
<td>Debrisoft&lt;sup&gt;b&lt;/sup&gt;</td>
<td>● Debrisoft was found to be an efficacious, simple, and short procedure that patients find comfortable.</td>
</tr>
<tr>
<td>Neiderer et al. 2011&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Chronic wounds</td>
<td>DermaStream&lt;sup&gt;c&lt;/sup&gt;</td>
<td>● NR</td>
</tr>
<tr>
<td>Wang et al. 2010&lt;sup&gt;14&lt;/sup&gt;</td>
<td>Chronically infected lesions (DFU and pressure ulcers)</td>
<td>MDT</td>
<td>● MDT was found to be safe and effective for treating chronically infected lesions.</td>
</tr>
<tr>
<td>Gethin et al. 2009&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Venous leg ulcers</td>
<td>Woundcare 18+&lt;sup&gt;d&lt;/sup&gt; vs hydrogel&lt;sup&gt;e&lt;/sup&gt;</td>
<td>● Increased healing incidence, effective desloughing, and lower incidence of infection was observed with Woundcare 18+.</td>
</tr>
<tr>
<td>Paul et al. 2009&lt;sup&gt;16&lt;/sup&gt;</td>
<td>DFU</td>
<td>MDT (&lt;i&gt;L. cuprina&lt;/i&gt;) vs conventional treatment</td>
<td>● MDT with &lt;i&gt;L. cuprina&lt;/i&gt; was as effective as conventional treatment for DFU.</td>
</tr>
</tbody>
</table>

ABI = ankle brachial pressure index; CCO = clostradial collagenase ointment; DFU = diabetic foot ulcers; MA = meta-analysis; MDT = maggot debridement therapy; NA = not available; NR = not reported; NRS = non-randomized study; PAD = peripheral artery disease; prep = preparation; RCT = randomized controlled trial; SOC = standard of care; SMG = saline moistened gauze; vs = versus.

<sup>a</sup> Abstract not available.
<sup>b</sup> New monofilament fibre product.
<sup>c</sup> A novel continuously streaming device for chronic wounds.
<sup>d</sup> Manuka honey
<sup>e</sup> IntraSite Gel.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses


Randomized Controlled Trials


Non-Randomized Studies


Guidelines and Recommendations


See: Section III, #10
   Section IX, #41
   Section X, #42a
   Contraindications

See: B. Interventions for Patients with LEND and Ulcers, #5b, c

See: Section 7.2 EMLA cream Recommendation
   Section 8.2.3 Wound debridement Recommendations

See: Interventions for ulcer management, Section Wound debridement EO 8 and EBR 6, pg. 26

See: Management of diabetic foot ulcers, Section 1.2.31, 1.2.32

See: D. Local Wound Care, #2a-f, 6a-c, and 7b Potential Harms

See: Patient Evaluation, Section 1.1

Patient selection and Indication, Section 2.1, 2.2, 2.3, 2.4, 2.8, 2.11
Contraindications and Precautions, Section 4.1, 4.2.1, 4.2.3, 4.2.8

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APPENDIX – FURTHER INFORMATION:

Clinical Practice Guidelines – Methodology Uncertain


Review Articles


   PubMed: PM21032937

   PubMed: PM19452661

Additional References

   PubMed: PM23587975

   PubMed: PM24156171

   PubMed: PM22591415

   PubMed: PM21983646

   PubMed: PM22162609