Indian Health Service
National Pharmacy and Therapeutics Committee
Formulary Brief: ***Topical Products for Chronic Wounds***
-February 2022-

Background:

A review of topical wound care product types was presented at the 2022 Winter meeting of the Indian Health Service (IHS) National Pharmacy and Therapeutics Committee (NPTC). A disruption in any of the three phases of normal healing can lead a wound to become chronic, defined as having a reduction in surface area of <15% per week, <50% in 1 month, or incomplete healing after 3 months. Clinicians can choose from a growing plethora of dressings and topical medications depending on specific wound characteristics. The review resulted in **no changes to the IHS National Core Formulary**.

Discussion:

Chronic wounds often involve the lower extremity and can be categorized based on an underlying diathesis, commonly including venous congestion, diabetes mellitus, ischemia, pressure injury, or a combination of these. A survey of U.S. Medicare beneficiary data in 2014 revealed a nonsurgical chronic wound prevalence of 11% costing $18 billion.[1] Venous leg ulcers (VLU) are most common, while the presence of a diabetic foot ulcer (DFU) is associated with a 40% 5-year mortality risk.[2] Medicare data reflect a 9.6% prevalence of DFU in American Indian/Alaska Native (AI/AN) diabetics, and African-American and AI/AN DFU patients undergo amputation at twice the rate of white patients.[3,4]

Goals of usual care include hastening complete healing and return of normal function while avoiding amputation and preventing infectious complications. This begins with accurate characterization of the wound type, optimizing management of underlying medical conditions, and attending to basic wound care principles, including: tissue debridement; signs of infection; wound moisture balance; and attending to wound edges. Revascularization, off-loading, and compression are crucial type-specific components of care.[5,6]

Hydrogels are water insoluble, semi-occlusive, moisture-retaining polymers applied directly to the wound bed either as a gel or integrated into a sheet dressing. A 2013 meta-analysis reviewed a range of dressing types for DFU and VLU finding that hydrogel promoted healing in DFU to a statistically significant degree.[7] Two more narrowly focused 2013 and 2015 Cochrane meta-analyses found evidence supporting its use for DFU but not VLU over more basic contact dressings. The evidence was at high risk of bias.[8,9]

Hydrocolloids are long chain polysaccharides, generally attached to a backing, which form a moisture-retaining gel in contact with water. They are used with more exudative wounds than hydrogel and, like hydrogel, are felt to promote autolysis of wound debris, a component of normal healing. A 2013 Cochrane study found no benefit over other dressing types for DFU.[10] Similarly, a 2014 meta-analysis of 9 RCTs including 694 patients showed benefit for pressure ulcer (PU) over gauze, but not over other special dressings.[11]

Alginates are highly absorbent polymers sourced from brown algae which can be used for exudative wounds or as a packing for cavitary wounds. Cochrane meta-analyses in 2013 and 2015 evaluated their use for treatment of DFU and pressure ulcers (PU), respectively. For DFU, alginates did not appear to have a statistically significant benefit over foam, antibacterial (silver-containing), or basic gauze dressing.[12] For PU, a collection of small trials comparing alginate dressing to dextranomer paste and two other silver-containing dressings showed no convincing improvement in healing; trials had high risk of bias and low evidence quality.[13]

Foam dressings are flexible and highly absorbent, composed of polyurethane, and can help avoid sheer injury. In 2013, a Cochrane study evaluated 6 small trials comprised of 157 patients comparing foam to other dressing types for DFU, and found no advantage over basic contact, alginate, or hydrocolloid dressings.[14] A similar 2017 Cochrane study which focused on PU healing found no advantage to foams over basic contact dressings or hydrocolloids.[15] The Infectious Disease Society of America (IDSA) guideline for DFU supports use of hydrogels, while Wound Healing Society (WHS) emphasizes the importance of using a dressing which provides continuous moisture, minimizes sheer, and is cost-effective without being more specific.

Collagenase is Clostridium-derived pharmaceutical alternative to sharp or other types of debridement. In a 2017 systematic review and meta-analysis, Patry et al. examined 22 studies including 927 patients, finding weak evidence for benefit in use with DFU and PU, as well as in combination with topical antibiotics for burn wounds. A smaller systematic review in 2008 found no benefit.[16,17] The WHS guidelines find enzymatic debridement acceptable for VLU and PU but cite a preference for sharp debridement for DFU, as does the IDSA guideline.[25,26] International Working Group for Diabetic Foot (IWGDF) guidelines discourage use of collagenase for DFU.[27] All guidelines advise caution in debridement of ischemic wounds until after revascularization.

Topical antibacterials commonly used in chronic wound care include formulations of iodine, silver, medical-grade honey, and polyhexamethylene biguanide. A 2014 Cochrane meta-analysis showed benefit for cadexomer iodine in healing VLU, but not silver or honey products.[18] The application of silver-containing foam dressings did not achieve overall faster complete healing than controls in a 2007 Cochrane review which included infected acute and chronic wounds.[19] Another large Cochrane study in 2015 including 3011 patients in 26 trials showed that honey hastened healing of partial thickness burns; the effect on VLU, DFU and mixed chronic wounds was not clear.[20] PHMB reduced bacterial burden without a statistically significant improvement in healing in a small 2016 systematic review examining effects on DFU, VLU, PU, and tracheostomy wounds.[21] The IDSA and IWGDF discourage use of topical antibiotics for most clinically uninfected DFU.

Protease inhibiting dressings have a theoretical role in wound healing, but Cochrane authors did not find high quality evidence of effectiveness nor was there clear evidence that wound protease levels correlated in any way to a delay in healing.[22,23] Becaplermin, a platelet-derived **growth factor**, is FDA approved for use in healing DFU with adequate blood supply. A Cochrane 2015 meta-analysis concluded that growth factors seemed to make complete healing of DFU more likely to occur but had no effect on the likelihood of toe amputation.[24]

Findings:

For the topical management of chronic wounds, overall evidence quality is low, often consisting of results gathered from small, non-blinded studies where the heterogeneity of patient and wound characteristics makes meta-analysis challenging. Cadexomer iodine and silver-containing dressings may hasten healing of VLUs. Collagenase, hydrogels, and becaplermin are likely to improve healing of DFU, although benefits conferred by becaplermin come with a high cost. Collagenase may improve healing of PUs. Honey products are likely to hasten healing of partial thickness burns. In general, wound care guidelines generally focus on basic principles of wound care, offering few strong recommendations matching advanced dressings to specific wound types.

If you have any questions regarding this document, please contact the NPTC at IHSNPTC1@ihs.gov. For more information about the NPTC, please visit the NPTC website.

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