

Pros and cons of hydrocolloid dressings for diabetic foot ulcers

These occlusive dressings promote a moist healing environment but may increase infection risk.

By Kristine Hoffman, DPM, FACFAS

Diabetic foot ulcers stem from multiple factors, including peripheral neuropathy, high plantar pressures, decreased vascularity, and impaired wound healing. Contributing significantly to morbidity, they may cause limb loss and death. (See *Foot ulcers and diabetes*.)

Initially, hydrocolloid dressings were developed to function as part of the stomal flange. Based on their success in protecting peristomal skin, they were introduced gradually into other areas of wound care. They contain wafers of gel-forming polymers, such as gelatin, pectin, and cellulose agents, within a flexible water-resistant outer layer. The wafers absorb wound exudate, forming a gel and creating a moist healing environment.

The wide range of hydrocolloid dressings available include fibrous and matrix dressings. Commercially available products include DuoDerm®, Granuflex®, Comfeel®, Cutimed® Hydro, and CovaWound™.



View: hydrocolloid dressings^A

Benefits

Hydrocolloid dressings are occlusive, retaining wound exudate and promoting the moist environment that's optimal for wound healing. They also promote autolytic wound debridement, removing



necrotic tissue—a barrier to wound healing—from the wound bed. Wet or moist wound environments promote re-epithelialization, reduce inflammatory reactions, and decrease scar formation. Hydrocolloid dressings also aid wound healing by retaining growth factors in the exudate, promoting granulation tissue formation and epithelialization.

Although these dressings are contraindicated for patients with infected ulcers, they're useful in preventing wound infection, serving as a barrier that prevents bacterial entry into diabetic foot ulcers. In addition, they promote a low pH, which reduces or even eradicates certain bacteria (namely *Pseudomonas aeruginosa*) from the wound bed.

Hydrocolloid dressings are self-adherent and easy to apply. The second most popular dressing for diabetic foot ulcers, they can be left intact up to 7 days, depending

Foot ulcers and diabetes

Patients with diabetes have a 15% to 20% lifetime risk of developing foot ulcers. More than 15% of these ulcers necessitate limb amputation. Diabetes is the leading cause of nontraumatic lower extremity amputations, with most amputations preceded by nonhealing ulcers.

Treatment of diabetic foot ulcers requires a multidisciplinary team approach, including endocrinologists, vascular surgeons, infectious disease specialists, wound care clinicians, and podiatrists. This approach has been shown to improve clinical outcomes and reduce the need for lower extremity amputation.

on the amount of wound exudate. The need for less frequent dressing changes can reduce disruption of healing, improve patient compliance, and decrease cost.

Disadvantages

Controversy exists over the use of hydrocolloid dressings for treating diabetic foot ulcers. Many wound care experts suspect they may increase the infection risk because they retain bacteria and purulent wound exudate, create a hypoxic wound environment, and lead to less frequent wound monitoring. Given these concerns,

Patient compliance factors

Patient compliance may be a problem with hydrocolloid dressings. Chronic wounds commonly have an offensive odor, which hydrocolloid and other occlusive dressings may worsen by trapping and containing malodorous exudate and odor molecules. However, cyclodextrin, an oligosaccharide that absorbs adventitious odors, has been added to hydrocolloid products to provide fluid and odor absorbency.

Patients also may have concerns about cost. Hydrocolloid dressings are significantly more expensive than traditional wound dressings, such as wet-to-dry gauze. On the other hand, they require fewer dressing changes, fewer supplies, and less professional time. Also, they cost about the same as advanced wound healing modalities, such as negative pressure wound therapy.

hydrocolloid dressings are contraindicated for infected wounds.

Use these dressing with care in diabetic patients. Make sure to obtain bacterial cultures before starting treatment, and change the dressing more often than in patients without diabetes.

Also, because they're occlusive, hydrocolloid dressings may lead to an overly moist wound environment, with excess moisture causing dressing separation and periwound maceration. Experts recommend using them only for wounds with low to moderate amounts of wound exudate.

In addition, the hypoxic environment created by these dressings may delay and impede wound healing and raise the infection risk. Leukocytes phagocytize bacteria but can't kill them in hypoxic environments because of the low oxygen tension; this significantly increases infection risk. Collagen maturation, endothelium development, keratinocyte migration, and granulation tissue formation depend on oxygen and may be inhibited by hypoxic wound bed conditions. (See *Patient compliance factors*.)

More research needed

Although many studies show hydrocolloid dressings are effective in treating diabetic foot ulcers, a 2012 systematic review by Dumville et al. found no evidence that they're more effective than basic wound contact dressings. Also, according to a 2013 review of randomized controlled trials, hydrocolloid dressings aren't more effective than basic wound contact dressings, foam dressings, alginate dressings, and topical treatments in managing diabetic foot ulcers. However, these studies produced sparse data and included research with risk of bias.

Consequently, proper patient selection is crucial. We need further research to evaluate the safety and effectiveness of hydrocolloid dressings for diabetic foot ulcers and to establish further guidelines for their use. ■

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