WOUND DEBRIDEMENT

The following case report illustrates a significant role for the ability of urea to soften and debride necrotic or devitalized skin - "Debridement of Necrotic Eschar With 40% Urea Paste Speeds Healing of Residual Limbs and Avoids Further Surgery" (Arch Derm Vol. 137 No. 10, October 2001).

REPORT OF CASES:

- A 50-year-old man with diabetes (patient 1) underwent left below-knee amputation (BKA) for a nonhealing infected foot ulcer. Necrotic eschars developed on the residual limb. He was referred to the dermatology department postoperatively for wound care prior to a planned above-knee amputation (AKA).
- A 62-year-old man with diabetes (patient 2) underwent bilateral BKA for gangrene secondary to foot ulcerations. One month postoperatively he was referred to the dermatology department for wound care of necrotic eschars involving both distal residual limbs.
- A 56-year-old man (patient 3) with diabetic neuropathy affecting both upper and lower extremities developed cellulitis and gangrene following thermal burns to the left sole. One month following BKA, the wound dehisced, and an adherent necrotic eschar formed at the distal residual limb.
- A 62-year-old woman with diabetes (patient 4) with ischemic gangrene of the left toes underwent BKA. After amputation, her residual limb developed ischemic necrosis with painful adherent eschar formation.

Painful ischemic ulcerations with adherent eschar formation complicate and prevent healing of BKA residual limbs. Reamputation above the knee may be necessary because unhealed limbs cannot be fitted with a prosthesis and pose a risk for infection. In addition to a second surgical procedure requiring anesthesia, AKA decreases the functional capacity of the limb.

Surgical or sharp debridement of ischemic eschars on residual limbs after BKA is difficult because of pain and adherence of the eschars. Often, sharp debridement requiring anesthesia can remove viable tissue and/or lead to progressive necrosis. Chemical debridement of necrotic eschars with enzymatic agents, including papain-urea (Accuzyme ointment; Healthpoint, Fort Worth, Tex), fibrinolysin-desoxyribonuclease (Elase ointment; Fujisawa Pharmaceutical Co, Deerfield, Ill), and collagenase (Collagenase SANTYL ointment; Knoll Pharmaceutical Company, Mt Olive, NJ), is marginally and slowly effective and may be complicated by increased inflammation and pain.

In our expanding experience, urea paste provides fast and effective softening of large and small eschars. The rapid action of urea results from its strong osmotic effect on the skin. With diffusion in and around corneocytes, urea disrupts hydrogen bonding and thereby exposes water-binding sites. Urea rehydrates the stratum corneum by drawing water from deeper epidermal and dermal tissues. This humectant property explains its ability to soften hard, devitalized tissue. Conversely, after removal of the urea paste from the skin, exposure to air rapidly reverses its humectant effect. For this reason, immediate debridement is required once the urea-occluded wound is uncovered.

Our cases illustrate a significant role for the ability of urea to soften and debride necrotic or devitalized skin. From our experience with eschar formation on distal residual limb wounds, we believe that debridement with 40% urea paste is the preferred efficient and effective method to remove adherent eschars, prevent AKA, and enhance quality of life.

We can compound urea in a variety of forms and strengths.

An example of how you might prescribe follows:

COMPOUNDED MEDICATION
Urea 40% **Topical Ointment** 120gm **Apply as directed**