

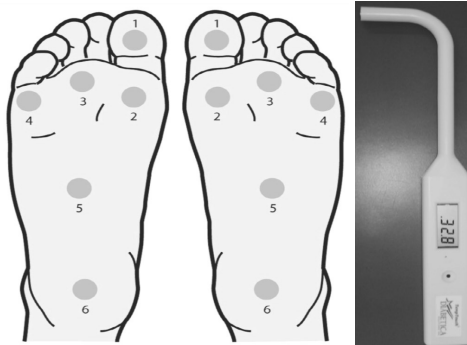
# DIABETIC FOOT ULCERS

## Evaluate

Evaluate wound age and size. A 50% decrease in wound size in a 4-wk period is a reliable predictor of healing potential. Conversely, a 20% increase in wound size over 2 wks is a reliable indicator of underlying infection. Erythema, edema, and/or purulent drainage, and especially an increase in wound size, indicate infection and need an MD consult for antibiotics rather than topical antimicrobial agents. The depth of the wound should be assessed and probed to identify osteomyelitis. The patient may require a vascular referral if perfusion is compromised; monitor vascular status regularly. A patient's A1c level must also be monitored regularly as higher hemoglobin A1c levels impede wound healing. Monitor albumin and pre-albumin levels since the body requires high levels of protein to heal. Social factors such as tobacco smoking and alcohol impede wound healing.

Off-loading is crucial to decrease shear stress and rate of strain. An AFO, CROW walker, CAM walker, or a total contact cast can decelerate the foot upon contact with the ground and shorten the time the foot is on the ground to offload the wound.

In a wound that is nonresponsive, use of a bioengineered skin substitute may be indicated if the wound size has reduced by 50% after 4 wks of conventional therapy.



Sites for thermal monitoring and a dermal thermometer

- 25% of DFU's will become infected
- 8% will require hospitalization
- 4.3% of all diabetics will undergo an amputation
- 20% of all diabetics will die from a direct complication of diabetes

## Patient Education: Foot Checks

- Should be performed twice a day
- Use a mirror to see the bottom of the foot
- Look for redness, discoloration, and swelling
- Feel for warmth
- Keep a logbook of all findings, draw a picture of any suspicious findings
- Advise the patient to contact you if they find any abnormalities
- Use of an at-home digital thermometer has proved to significantly reduce the incidence of DFU's among high-risk patients

## Multidisciplinary Approach:

- Wound care specialists
- Cardiologists
- Nephrologists
- Endocrinologists
- Ophthalmologists
- Infectious disease specialists
- Nutritionists
- Orthotists

## Nutrition



A healthy individual without a wound requires 1 gram of protein per 2.2 lb's of body weight to maintain healthy function. In the presence of a wound, one needs 2 grams per 2.2 lb's of body weight. In patients who are protein-deficient, supplementation of arginine and glutamine may be necessary (12.5 -18.7g/L-arg; 0.57g/kg/day-glut). Arg is involved in protein

synthesis and collagen deposition; glut is involved in synthesis of fibroblasts, epithelial cells, and macrophages. A patient needs at least 8 x 8oz glasses of water a day. Hydration can be assessed by increases in hematocrit, hemoglobin, BUN:Creatinine ratio, chloride, albumin, urine specific gravity, and osmolality. These lab tests should be used in combination with intake and output records, daily weights, and physical exam. 1-2g daily of Vitamin C (essential in all phases

of wound healing), 25000IU daily of Vitamin A (acts in the inflammatory and proliferative phases of healing), and a cautionary amount of Vitamin E can help to improve wound healing. Vitamin E can have alternate effects in types of wounds or in the presence of other nutrients depending on whether it is a water- or lipid-soluble preparation. 1mg daily of Zinc (15-30mg if deficient) is essential for DNA synthesis, cell division, and collagen and protein

synthesis. 18mg of iron to prevent anemia is beneficial to wound healing. 6 micrograms of Vitamin B12 daily is essential for red blood cell production. Dark orange and green vegetables, orange fruits, nuts, red meat, oysters, crab, and milk are great sources of these vitamins and minerals. Supplementation may be required in deficient patients, and a referral for nutrition counseling may be warranted.