

Diabetic Wounds of the Lower Extremity



Problem:

Diabetes now affects nearly 24 million people in the United States, an increase of more than 3 million in approximately two years, according to 2007 prevalence data estimates released by the Centers for Disease Control and Prevention. This means that nearly 8 percent of the U.S. population has diabetes.¹ Of this number, approximately 15% will develop a foot ulcer. Ulcerations of the feet, wound infection, and progressive tissue loss represent a major source of morbidity and mortality in patients with diabetes.²

Diabetes Mellitus (DM) is the leading cause of all lower extremity amputations in the U.S. According to a recent John Hopkins study, there were about 86,000 diabetes-related amputations performed in 2003.³ In 2007, that number would have increased to approximately 120,000 per year, assuming that 0.5% of patients with diabetes received some type of lower extremity amputation. Other studies suggest that the amputation percentage may be as high as 1%.⁴ Assuming the increase in diabetes incidence remains the same, amputations would then number approximately 135,000 per year in 2009.

Reason:

Peripheral artery disease (PAD) is a decisive factor leading to foot and leg wounds in patients with diabetes.⁵ That's because this patient population is more likely to have PAD, thereby reducing blood flow to the lower legs and feet. In addition, they are more likely to have peripheral neuropathy which increases their risk of getting ulcers and infections that can potentially result in the need for amputation.

Chronic wounds become a primary concern for these patients once an injury occurs and healing success decreases significantly due to the presence of tissue hypoxia and potential infection. Literature suggests that if more attention were provided to foot care in this high risk patient population, serious morbidity and even mortality could be prevented.⁶

Solution:

The **Advanced Wound Center (AWC) at Community Hospital Anderson** offers a multidisciplinary approach to the management of these complicated wounds. Oftentimes the amount of care required for desirable outcomes surpasses the resources which any single physician can provide. Wound healing at the AWC is achieved in cooperation with referring physicians, surgeons, podiatrists, and other specialists as required.

Treatment options include the utilization of advanced wound care modalities which have proven to improve healing rates and prevent am-

putations. Hyperbaric oxygen therapy (HBOT) is used adjunctively with revascularization procedures or as a primary treatment when revascularization is not an option. Aggressive wound debridement, bioengineered tissue products and negative pressure wound therapy may also be used to support and provide the best opportunity for healing. *HBOT, in conjunction with an aggressive multidisciplinary therapeutic protocol, is effective in decreasing major amputations in diabetic patients with severe prevalently ischemic foot ulcers.*⁷ Adjunctive hyperbaric oxygen therapy also improves host response to local soft tissue and bone infection.

Diabetic Wounds of the Lower Extremity (DWLE) became the 15th CMS approved indication for Hyperbaric Oxygen Therapy in 2003.

In patients with Wagner grade III or greater diabetic wounds of the lower extremity (DWLE), hyperbaric oxygen therapy should be considered as an adjunctive treatment.

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Photo courtesy of Sechrist Industries, Inc.

CMS (Medicare) approved coverage of DWLE effective April 1, 2003 with the following provisions:

- Type I or Type II DM (specific diabetes codes required)
- Wagner Grade III, or higher, ulcer on a lower extremity (specific ulcer codes required)
- Failed course of standard wound care (no measurable signs of healing for 30 days)
 1. Decrease in volume or size
 2. Decrease in exudate
 3. Decrease in necrotic tissue

Grade III: deeper tissues involved and there is abscess,

Grade IV: gangrene of some portion of the toe, toes, and/or forefoot

Grade V: gangrene involving the whole foot or enough of the foot that no local procedures are possible

Remember that anatomically Wagner grade II and III are the same. It is the presence or absence of infection that defines the transition to Wagner grade III from II, so aggressively look for evidence of infection; any ischemic necrosis will move the grade to Wagner IV.

Continued HBOT will not be covered if there are no measurable signs of healing during a 30 day period. Additionally, patient education is vital to improve compliance with initial treatment requirements and lifestyle modifications may be necessary to prevent future wounding.

Since periwound tissue hypoxia has been shown to be an important determinant of wound healing in diabetic patients, the **Advanced Wound Center** can perform transcutaneous oxygen measurements (PtcO₂) when necessary. Patients with demonstrated tissue hypoxia and an abnormal pulse examination go on to further peripheral vascular evaluation and possible surgical intervention.



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Wounds with a PtcO₂ < 30 mmHg are predicted not to heal based on critical ischemia / hypoxia without the addition of HBOT. Wounds with a PtcO₂ of 30-50 mmHg might heal without HBOT, but on average they will take more than 12 weeks.⁸

Patients can be referred to the **Advanced Wound Center** for aggressive, outcome-based wound management. The physicians at the AWC provide specialized care in

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close coordination with the patient's primary physician. Care includes the application of advanced wound care technology and hyperbaric oxygen treatment, as indicated, based on evidence-based clinical pathways. The referring physician will continue to provide overall medical care for the patient and will receive frequent updates on the patient's response to care at the AWC.

While treatment of established wounds in patients with diabetes is a major emphasis of our program, reducing the overall risk of lower extremity amputations in these patients is equally important. Discharge education focuses on patient follow-up with their primary physician, endocrinologist, and podiatrist to maintain health, receive proper footwear, and undergo frequent foot examination. In this manner ulcer prevention will become a more significant aspect of the care of these patients.

References:

1. Centers for Disease Control and Prevention press release dated June 24, 2008
2. American Diabetes Association (April 7-8, 1999) Consensus Development Conference on Diabetic Foot Wound Care Diabetes Care 22(8) 1354-1360, 1999
3. John Hopkins Health Alert dated January 18, 2007
4. Reiber GE, Lipsky BA, Gibbons GW. The burden of diabetic foot ulcers. Am J Surg. Aug 1998;176(2A Suppl):5S-10S. [Medline]
5. American Heart Association PAD website updated on April 30, 2009
6. American Diabetes Association (April 7-8, 1999) Consensus Development Conference on Diabetic Foot Wound Care Diabetes Care 22(8) 1354-1360, 1999
7. Faglia E, et al. Adjunctive systemic hyperbaric oxygen therapy in the treatment of diabetic foot ulcer. A randomized study. Diabetes Care 1996;19:1338-43.
8. Marston WA, et al. Natural history of limbs with arterial insufficiency and chronic ulceration treated without revascularization. J Vasc Surg 2006; 44:108-114.

The Curespot

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