

# Severity Score Simplifies Foot Ulcer Management

*For use with diabetic patients, the new system rates four wound factors found predictive of healing.*

BY MARY ANN MOON  
Contributing Writer

A new system for scoring the severity of foot ulcers in diabetic patients helps predict the likelihood of healing, hospitalization, local surgery, and amputation, according to Dr. Stefan Beckert and his associates at the University of Tübingen (Germany).

Although other researchers have made attempts to establish classification systems that help gauge the severity of foot ulcers, most have been too complicated for widespread clinical application. Some systems required extensive work-ups and complex grading schedules, and no simple severity scores have been adopted into routine

clinical practice, the investigators said.

Dr. Beckert and his associates followed 1,000 consecutive diabetic patients with foot ulcers to develop such a score, which they termed the Diabetic Ulcer Severity Score (DUSS), and to test its practical use in predicting outcomes.

The median subject age was 69 years, and subjects were followed for up to 1 year after presenting for outpatient foot ulcer care. Treatment was given by an interdisciplinary team of a general and vascular surgeon, a radiologist, a diabetologist, an orthotist, and a wound care nurse. It consisted of sharp debridement, advanced local surgery such as limited bone resections if necessary, moist wound therapy, and adequate pressure off-loading.

Four factors—pedal pulses, bone involvement, site of ulceration, and number of ulcerations—were found to predict outcome, and a simple scoring system was developed to rate these factors, the investigators said (Diabetes Care 2006;29:988-92).

Absent pedal pulses were scored as 1, while present pedal pulses were scored as 0. Bone involvement, defined as the ability to probe the ulcer to the bone, was scored as 1, lack of bone involvement, a 0. Ulceration was scored as 0 if it involved only the toe; 1 if it involved the foot. Multiple wounds were scored as 1 while single wounds were scored as 0.

The overall DUSS was determined by adding these four components, so possible scores ranged from 0 to 4.

Patients with a DUSS of 0 had a 93% probability of healing. The probability of healing decreased steadily with increasing DUSS, to a low of 57% for scores of 4.

Local surgery was required for 9% of patients with a DUSS of 0, 17% of those with a DUSS of 1, 27% for those with a score of 2, 37% for those with a DUSS of 3, and 50% of those with a DUSS of 4. Similarly, hospitalization was required for 39% of patients with a DUSS of 0, 49% of those with a DUSS of 1, 63% of those with a DUSS of 2, 72% of those with a DUSS of 3, and 92% of those with a DUSS of 4.

The likelihood of amputation followed this same pattern for the most part. Patients with a DUSS of 0 had no risk of amputation, those with a DUSS of 1 had a 2% risk, those with a DUSS of 2 had an 8% risk, and those with a DUSS of 3 had an 11% risk. However, the pattern did not hold for patients with a DUSS of 4 (4% risk), most likely because of the small number of patients in this subgroup and the low number of amputations overall, the researchers said. ■

## Tailor Exercise Recommendations For Patients With Diabetes

BY DAMIAN McNAMARA  
Miami Bureau

MIAMI — Not enough diabetic patients exercise, but even when they do, greater attention needs to be paid to how to best manage the effects of exertion on their type of disease, Dr. Dennis A. Cardone said at the annual meeting of the American Medical Society for Sports Medicine.

"More than 50% of diabetics are not meeting exercise goals," said Dr. Cardone, who is in private practice at Pediatric Orthopedics of Southwest Florida in Fort Myers.

In the setting of type 1 diabetes, exercise can reduce the severity of microvascular complications and improve lipid profiles. And although there is no evidence that exercise prevents type 1 diabetes, it has been shown to prevent type 2 diabetes.

Dr. Cardone advises diabetics, regardless of their disease type, to use a bracelet or shoe tag that identifies them as diabetic, to exercise with a partner, and to bring snacks and a glucagon kit (complete with instructions on how to use it).

As far as making sure that type 1 disease is well managed during workouts, get a thorough history of what steps patients have taken while exercising in the past. "If they are newly diagnosed, have them do frequent monitoring of their glucose during an initial exercise regimen, and use that information for their exercise and diabetes management plan." And obviously, patients need to choose their form of exercise wisely. "For risky sports, such as skydiving, scuba diving, climbing, and motor racing, it is common sense: If they have a hypoglycemic episode, the results could be disastrous," Dr. Cardone said.

Marathon runners with type 1 diabetes are at increased risk of complications related to dehydration, Dr. Cardone said. Other risks involve their tendency toward peripheral and autonomic neuropathy.

"You may recommend they check blood sugar every 6 miles," but the reality is that management should be highly individualized and tailored to factors such as the frequency of hypoglycemic episodes.

Alcohol should be avoided 24 hours prior to exercise. Instruct type 1 patients to inject insulin about 1 hour before exercise at a nonexercising site, such as the abdomen. Drop short-acting insulin by 30% prior to exercising for 1 hour, by 40% for 2 hours, and by 50% for 3 hours, he suggested.

Avoid evening exercise to minimize risk of nighttime hypoglycemia. "Usually morning is the best time for exercise for type 1 diabetics, especially before the morning dose of insulin," Dr. Cardone said.

"The general rule is that if glucose is greater than 250 before exercise, it is better to hold off until their number lowers. If glucose is less than 100, supplement before exercising," he said.

The most effective combination for type 1 diabetics is insulin lispro plus Ultralente, Dr. Cardone said. It is easier to control blood sugar while exercising. The literature supports a good response, especially in high-level athletes, he said.

For the nondiabetic athlete, glucose falls off slowly over time but stays within a therapeutic range. In contrast, "glucose can be all over the place" for the exercising diabetic, Dr. Cardone said. Instruct patients to monitor glucose, hydrate, and increase caloric intake 12-24 hours after exercise, he said.

Causes of hypoglycemia include too much preexercise insulin, increased absorption from the injection site, inadequate caloric intake, and spontaneous activity.

"Most of the athletes with diabetes who become hypoglycemic run into problems after exercise, up to 24 hours after activity. They don't have the mechanism to shut off endogenous insulin." Whole milk and sports drinks can be effective prevention, he added. ■

## In Hypertensives With Impaired Glucose, Skip Thiazide Diuretics

BY MITCHEL L. ZOLER  
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NEW YORK — An angiotensin receptor blocker was unable to counter the glucose intolerance triggered by a thiazide diuretic in a study of more than 200 patients with metabolic syndrome and hypertension.

Hydrochlorothiazide (HCTZ) is known to cause glucose intolerance in patients. The new results show that adding an angiotensin receptor blocker (ARB) doesn't eliminate the problem, Dr. George L. Bakris said while presenting a poster at the annual meeting of the American Society of Hypertension.

The implication is that for hypertensive patients who already have impaired glucose tolerance and normal kidney function, antihypertensive regimens should not initially include a thiazide diuretic, said Dr. Bakris, director of the Hypertension/Clinical Research Center at Rush University, Chicago.

For patients with a normal fasting glucose level, this restriction does not apply; they can start on whichever antihypertensive regimen their physician prefers. And patients with impaired renal function and hypertension need treatment with a diuretic, regardless of what impact the drug might have on their glucose tolerance, Dr. Bakris said in an interview.

The study, conducted by Dr. Bakris and his associates, enrolled 240 patients with hypertension and metabolic syndrome. Their fasting blood glucose level at entry had to be at least 100 mg/dL but no more than 125 mg/dL.

The patients were randomized to treatment with either a combination of

the angiotensin-converting enzyme inhibitor trandolapril and the sustained-release formulation of verapamil, a calcium channel blocker, or HCTZ plus the ARB losartan. The dosages were titrated up as needed to reach a goal systolic pressure of less than 130 mm Hg, and treatment was continued for a year. The maximum daily dosages that the protocol allowed were 4 mg of trandolapril, 240 mg of verapamil, 100 mg of losartan, and 25 mg of HCTZ.

After a year of treatment, the average postprandial 2-hour glucose level, as measured using an oral glucose tolerance test, was 139 mg/dL in 108 patients treated

with trandolapril and verapamil, an average reduction from baseline of 5 mg/dL. In contrast, the average 2-hour glucose level was 168 mg/dL in 107 patients treated with HCTZ and losartan, an average rise of 24 mg/dL compared with baseline, a statistically significant difference between the two treatment groups.

Patients in the HCTZ plus losartan group had worse glucose tolerance by other, secondary measures as well, including a significantly higher 2-hour postprandial insulin level and an increased level of hemoglobin A<sub>1c</sub>. By the end of the study, about 25% of patients in the HCTZ plus losartan group had developed new-onset diabetes, compared with about a 10% rate in the trandolapril plus verapamil group, a statistically significant difference.

The study was sponsored by Abbott Laboratories, maker of a formulation of trandolapril plus verapamil (Tarka). Dr. Bakris is a consultant to Abbott as well as several other drug companies. ■



**Adding an angiotensin-receptor blocker doesn't eliminate thiazide-invoked glucose intolerance.**

DR. BAKRIS