

## Predictive Value in SnapshotNIR Images for Assessing a Below Knee Amputation Viability of a Diabetic Foot Ulcer

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### PATIENT HISTORY:

A 68-year-old male with Type II diabetes, hypertension, hyperlipemia, Grade 1 diastolic heart failure, COPD, and pulmonary hypertension presented to the clinic with a chronic Grade IV ulceration at the medial aspect of the first metatarsophalangeal joint on the left foot.

### CASE DETAILS:

The patient had non-palpable femoral, popliteal, dorsalis pedis and posterior tibial pulses bilaterally. Capillary filling time to the left hallux and lesser digits was greater than 7 seconds and the left foot was cold.

Radiographs of the left foot revealed diffuse osteopenia but no lytic or destructive changes in the left forefoot. A CT scan was also obtained and did not reveal any bone lysis or destructive changes to the first metatarsal head or in the proximal and distal phalanx of the left hallux.

SnapshotNIR was used to determine if the patient would qualify for an amputation. The images derived from SnapshotNIR showed tissue oxygen saturation ( $S_tO_2$ ) values in the low 40s and 50s in the peri-wound area. The values around the distal heel of the foot ranged from 60s to 70s.

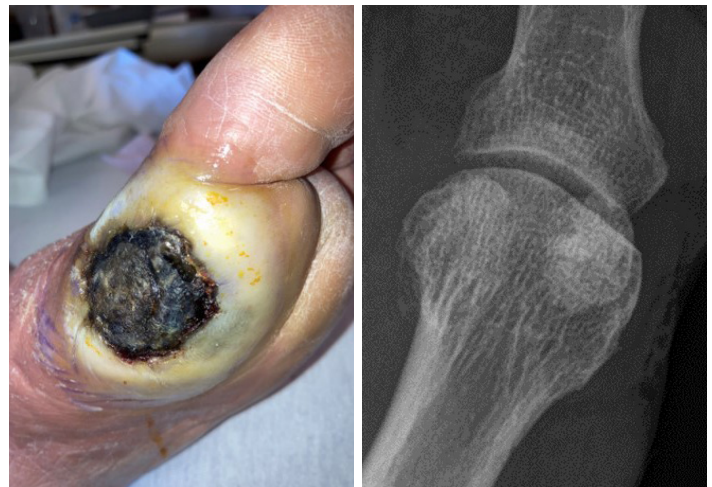


Fig 1. Clinical image (1A) and X-ray scan (1B) of left foot with a Grade-IV ulceration with dry eschar.

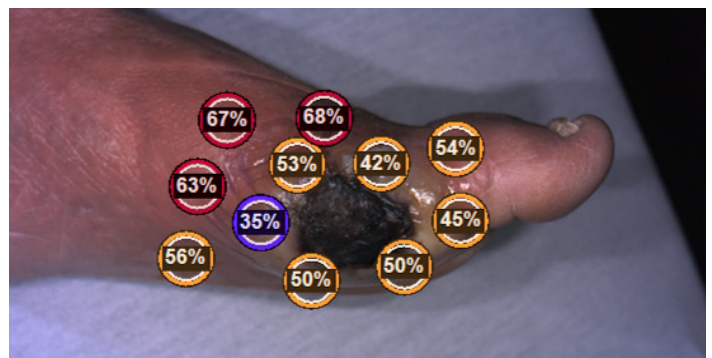


Fig 2A. Clinical image of the lateral surface of the left foot.

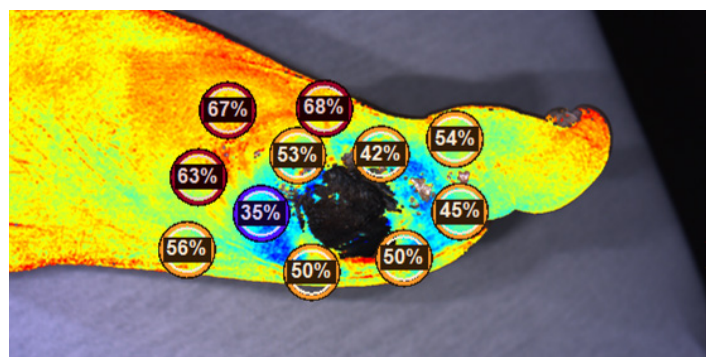


Fig 2B. S<sub>t</sub>O<sub>2</sub> image of the lateral surface of the left foot.

### Ron Ray, DPM

Dr. Ray is a Podiatrist at the Benefis Foot and Ankle Clinic in Great Falls, Montana. His expertise is in Ankle and Foot reconstructive surgery and management of chronic non-healing wounds. He is Past-President of the Montana Podiatric Medical Association and current Chair of the Surgical Skills Committee, American College of Foot and Ankle Surgeons.



**IMPACT:**

With significantly compromised tissue oxygenation in wound/peri-wound area, the amputation was not performed due to the lack of oxygenation and concern that surgical intervention would lead to a failure of the amputation site during the procedure. With no bone involvement, the management plan included the use of hyperbaric oxygen therapy (HBOT) and reassessment of the patient every 3-4 weeks, watching for signs of infection or a positive response to treatment.



Fig 3. Images of the plantar surface of the left foot.

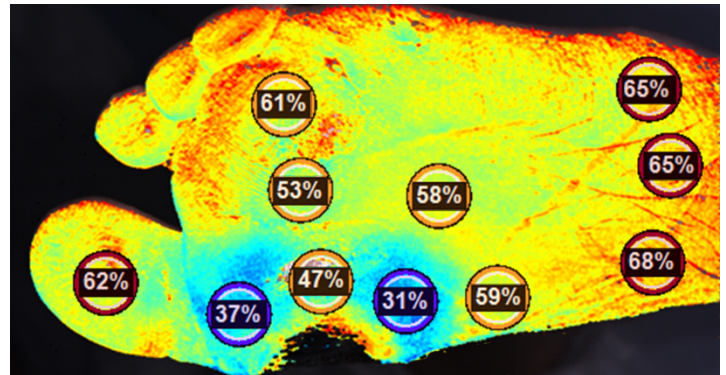


Fig 4. Images of the dorsal surface of the left foot.

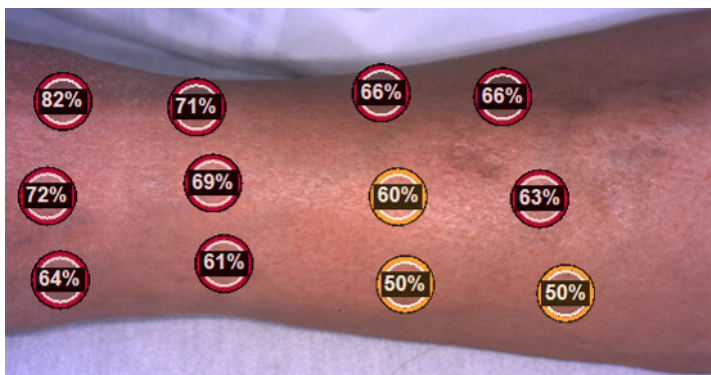
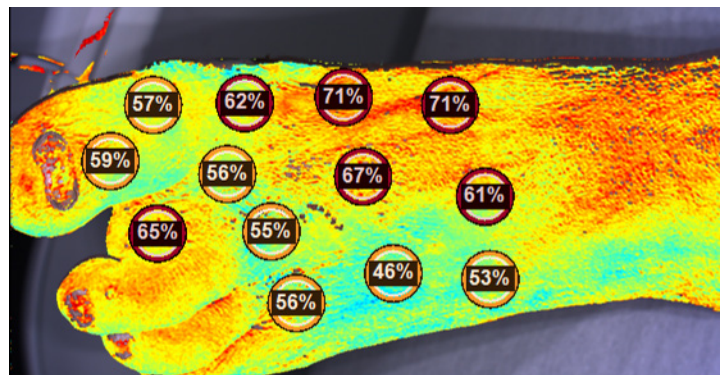
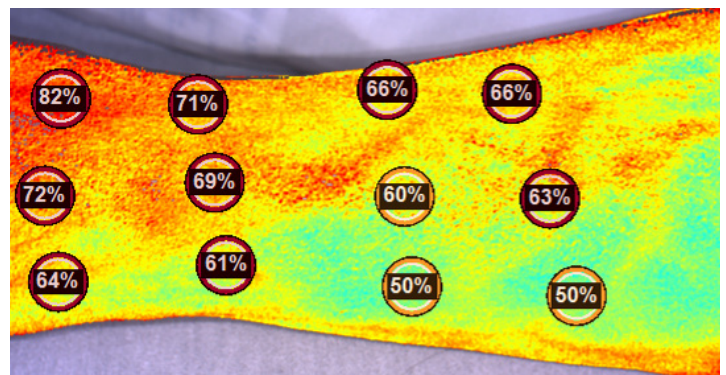


Fig 5. Images of the left calf.



*“SnapshotNIR provides both an immediate assessment of the  $S_tO_2$  of a given area and a level of predictability about how a wound will likely heal when deciding on different treatment options. When considering an amputation for a patient, low  $S_tO_2$  values suggest poor healing capabilities for that area. Therefore, alternative treatment options should be pursued and more aggressive treatments should be postponed until the poor oxygenation levels have been addressed.”*

**-Ron Ray, DPM**

