USE OF TRANSCUTANEOUS OXIMETRY (TcpO2) TO ASSIST IN VASCULAR ASSESSMENT OF THE DIABETIC FOOT

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Background:
In the diabetic, vessel calcification can frustrate the interpretation of arterial Doppler assessments (resulting in false negatives). As well, toe pressure assessments may not be possible to perform in cases of distal digital gangrene leaving uncertainty about the healability of such lesions.

Normal Tissue

Reproducibility of tcpO2 mappings provides useful information about healability of a nearby ulcer.

Hypoxic Tissue

Routine Assessment:
- Initial resting O2 values are measured at several sites near a wound as well as more proximal sites used as a reference to identify and map areas of tissue ischemia while breathing air at ambient pressure.

Optional Refinements:
- If indicated, dynamic measurements of rate and degree of change in tissue pO2 with a change in breathing gas repeated at the same sites provides information of higher diagnostic yield of healability. Additional assessment of tissue metabolic limitations through limb elevation and/or exercise can also be of value.

Requirements:
Such assessments require only an oxygen source and oximeter plus training in the consistent use and interpretation of recorded values.

Practical Hints (Quality Assurance):
The skill of the technician in identifying the presence of factors which may hamper reproducibility is paramount to the integrity of the quality of the assessment. The following common patient issues must be reported - and minimized as much as possible:
- Lead Placement: To ensure accurate reproducible serial assessments over time, precise placement is required - even a few mm can alter readings.
- Smoking: Leads to vasoconstriction lasting hours.
- Edema: Increased distance for oxygen to diffuse through.
- Limb Elevation: Results in reduced blood flow.
- Patient Activity: Talking, change in breathing, as well as movement will alter readings.
- Poor Mask Fit: Inconsistent mask fits will lead to leak and random oxygen content.

Summary:
More widespread use of transcutaneous oximetry as a tool to determine the "healability" of a wound is recommended - especially in the assessment of selected cases of diabetic foot ulceration.

Reference: