I. What is tcpO₂?
Transcutaneous oxygen, tcpO₂ or TCOM, is a local non-invasive measurement reflecting the amount of O₂ that has diffused from the capillaries, through the epidermis, to a Clark-type electrode at the measuring site. It provides instant continuous information about the body’s ability to deliver oxygen to the tissue.

II. Why measure tcpO₂?
Transcutaneous oxygen measurement is a well-documented technique routinely used by clinicians for wound healing prediction, screening for vascular disease, assessing the success of revascularization, predicting amputation level, and qualification for hyperbaric oxygen therapy.

III. Reference values
- 50–70 mmHg Normal
- < 40 mmHg Impaired wound healing
- < 30 mmHg Critical Limb Ischemia

IV. Influencing factors
A low tcpO₂ value can be influenced by several factors:
- Peripheral Arterial Disease (PAD)
- Capillary impairment
- Cardiopulmonary disease
- Edema
- High consumption of O₂ due to infection/inflammation

V. Interpreting results
Oxygen challenge (tcpO₂ measurement during 100% oxygen inhalation), will distinguish low values due to a barrier to oxygen diffusion (edema and/or inflammation) from macrovascular disease (PAD). It can also determine candidates for HBO (Hyperbaric Oxygen) treatment.

Normal values: > 100 mmHg and/or > 100% increase from baseline.

Leg elevation for a duration of 5-15 minutes may be used to confirm macrovascular disease.

Normal values: Drop < 10 mmHg and/or < 20% from baseline.

Other methods to confirm macrovascular disease include toe and ankle pressure.

Reference electrode or oxygen saturation (pulse oximeter) will rule out arterial hypoxemia (due to pulmonary disease, for example).

A mean of several tcpO₂ values is a better predictor of wound healing potential than a single site value.

To predict benefit from HBO (Hyperbaric Oxygen) treatment.


Baseline and oxygen challenge values for three different patients with a wound. One of the healers had a baseline tcpO₂ value above the threshold value of 40 mmHg, and one below. The latter case stresses the importance of using provocations to distinguish low values as a consequence of an inflammatory process, from macrovascular disease.
PeriFlux 6000 tcpO₂ Practically

I. Let the patient rest in supine position
   Keep feet and toes warm.

II. Start instrument and calibrate electrodes
    Power up at the rear panel.
    Allow the instrument 5 minutes to warm up.
    Calibrate electrodes by tapping CAL.

III. Enter patient details
    Tap the Patients tab. Select an existing patient or create a new entry. Tap the Clinical Info icon to enter patient medical history.

IV. Attach fixation rings
    Remove body hair, blot with medical tape and wipe site with alcohol.
    Avoid bony prominences, areas of edema, large superficial vessels, callused skin, plantar surface of the foot and infected or inflamed areas close to the wound.

V. Document electrode positions
    Take a photo. Connect camera to USB port (rear panel).
    Tap the Sites tab. Tap the Camera icon and select photo.
    If you do not want to use a camera, tap the Image icon and select suitable illustration.

    Indicate the sites by tapping and dragging the corresponding Handle icon over the site of each electrode. Name channels. Make sure color coding is correct.

VI. Start measurement, follow instructions
    Tap the Start icon. Select appropriate test.
    At least 15 minutes for stable baseline.
    Perform provocations if necessary - leg elevation/O₂ inhalation.

VII. Print or export report as PDF-file
    Export directly to a USB device or via PeriFlux Configuration Software (PCS).

Calibration
Calibration ensures accurate measurements and should be performed:
• prior to each measurement period
• when changing measuring sites
• every four hours
• every time an electrode has been remembraned (calibrate twice)

Cleaning and Maintenance of Electrode
Gently wipe the electrode and cable with a soft cloth or tissue moistened with water.
Use clean tissues to remove any remaining moisture. The following water-based disinfection solutions are recommended: MadaCide-FD (MADA Inc.), Control III (Maril Products Inc.), Sekusept Plus (Ecolab).
Note! Avoid exposing the electrode cable to any product (hand lotion or disinfection solution, for example) based on isopropanol/propyl alcohol/ethanol as frequent exposure to these products may damage the electrode cable.

To obtain reliable measurements, electrode remembraning is recommended every week.

For detailed instructions, please refer to the Operator’s manual.