



## TCPO<sub>2</sub> Handout and Guide

**Effective Date:** 1/14/26

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### Overview

TcPO<sub>2</sub> stands for **Transcutaneous Partial Pressure of Oxygen**. It is a non-invasive measurement that reflects the amount of oxygen diffusing from capillaries through the skin, offering a direct assessment of local tissue oxygenation and microcirculatory function. TcPO<sub>2</sub> measures oxygen tension at the skin surface, reflecting local tissue perfusion and microvascular integrity. It is a non-invasive, reproducible test that provides real-time physiological data essential for assessing wound healing potential, predicting amputation outcomes, and planning revascularization strategies. TcPO<sub>2</sub> is particularly crucial for evaluating patients with diabetes, peripheral arterial disease (PAD), and chronic limb-threatening ischemia (CLTI), where wound healing can be unpredictable. Consistent use of TcPO<sub>2</sub> can enhance interdisciplinary care decisions, optimize wound care management, and support more precise surgical planning. This diagnostic tool helps identify patients at risk for poor healing early, thus preventing prolonged wound care courses and unnecessary lower extremity amputations.

### Key TcPO<sub>2</sub> Values

- 40 mmHg: Normal perfusion; high likelihood of healing (93–95%) (Fife et al., 2002).
- 30–40 mmHg: Borderline; may heal but depends on comorbidities and local factors (Faglia et al., 2009).
- 20–29 mmHg: Poor perfusion; reduced chance of healing (50–70%) (Padberg et al., 1996).
- < 20 mmHg: Critical ischemia; very low likelihood of healing (<25%) (Kalani et al., 2002).

### Clinical Application in Amputation Planning

- Above 30 mmHg: Healing is likely; minor amputation or wound healing expected.
- 20–30 mmHg: Healing uncertain; revascularization may be necessary before proceeding with lower-level amputation.
- Below 20 mmHg: Healing unlikely; higher-level amputation (e.g., above the ankle) or revascularization strongly advised.

### Additional Points

- TcPO<sub>2</sub> values improving by >10 mmHg with 100% oxygen inhalation ("oxygen challenge") predict better outcomes (Schils, 2006).
- Measurements must be taken under standardized conditions to minimize variables such as skin temperature, edema, infection, and systemic oxygenation (Scheffler et al., 2008).
- TcPO<sub>2</sub> enhances diagnostic accuracy when combined with other vascular studies such as ankle-brachial index (ABI) and toe pressures.
- TcPO<sub>2</sub> < 30 mmHg correlates with an 80% risk of non-healing without revascularization (Kalani et al., 2002).



## Healing Probability and Amputation Need Table

TcPO <sub>2</sub> (mmHg)	Expected Healing Rate	Interpretation	Amputation Recommendation
>40	93–95%	Normal	Limb salvage likely
30–40	70–90%	Borderline	Attempt salvage; revascularize if needed
20–29	50–70%	Poor perfusion	Consider revascularization; high amputation risk
<20	<25%	Critical ischemia	High-level amputation likely without intervention

## Summary

- TcPO<sub>2</sub> provides objective and quantitative data critical for limb salvage vs. amputation decisions.
- Interpretation must integrate with clinical judgment, vascular imaging, systemic risk factors, patient comorbidities, and patient-centered goals of care.
- Consistent use of TcPO<sub>2</sub> at St. Mary Medical Center can optimize patient outcomes by guiding targeted interventions, reducing morbidity, and supporting interdisciplinary treatment strategies.

***It can be ordered on EPIC by typing in TCPO2 on the order search line. Order the lower or upper extremity TCPO2 as needed. It is under imaging. DO NOT SELECT THE RESPIRATORY OPTION.***

### Version Control Record

Version	Date	Author/Reviewer	Description of Changes
1	1/14/26	Paul Wisniewski, D.O.	Initial review and update to reflect latest evidence/practice

## Works Cited

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- Schils, J. (2006). The utility of transcutaneous oxygen measurement in the prediction of diabetic wound healing. *Foot and Ankle Clinics*, 11(4), 745–751.
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- The guidelines are for informational purposes only and are not intended to replace professional medical judgment. They should be used as a reference and adapted to the specific needs of individual patients.
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