Digital Ischemia
Clinical Pathway Synopsis

Objective of Clinical Pathway

To provide care standards for the management of patients at risk for digital ischemia in the intensive care setting. The pathway provides recommendations for monitoring, early interventions, and salvage therapy in consultation with orthopedic surgery.

Background

Medical teams face a number of challenges when caring for critically ill patients, including maintaining adequate perfusion of vital organs, limbs and digits. In patients with severe illness, vasopressors with or without the use of extracorporeal membranous oxygenation (ECMO) may be needed to support perfusion but also come with risks such as ischemia of the fingers and toes secondary to vasoconstriction or hypercoagulable states.[1-3] Complications from digital ischemia may include tissue necrosis, infection, and amputation.[4,5]

Standard management options for digital ischemia include minimizing vasopressor use, warming the affected areas, applying topical nitroglycerin, and providing aggressive wound management; however, the condition will often still progress to the complete loss of affected digits. Therefore, additional interventions may be warranted. Recent literature suggests that onabotulinumtoxinA may offer benefit in preserving ischemic digits. While most evidence comes from adult studies involving Raynaud's syndrome, several smaller case reports and series describe its use in ischemia from other etiologies.[4-7] Given the potential for severe morbidity associated with progressive digital ischemia, this pathway was developed to provide best practices for standard management and salvage therapy when indicated.

Target Users

- Physicians (Intensivists, Orthopedic Surgery, Fellows, Residents)
- Physical and Occupational Therapists
- Advanced Practice Providers
- Nurses
- Pharmacy
- Wound Care Nurses

Target Population

Exclusion Criteria

- Ischemia due to:
  - Traumatic injury
  - Extravasation
  - Compartment syndrome

Practice Recommendations

Practice recommendations in this clinical pathway are based on consensus among providers with knowledge of the existing evidence and expertise in the evaluation, treatment, and monitoring of patients with digital ischemia.

Measures

- Number of patients receiving onabotulinumtoxinA (Botox)
- Access of the clinical pathway (website hits)

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families, as well as reducing costs and resource utilization for healthcare facilities.

- Decreased unwarranted variation in care
- Decreased complications from digital ischemia

Organizational Barriers and Facilitators

Potential Barriers

- Variability in the acceptable level of risk among providers
- Variability in experience among clinicians

Potential Facilitators

- Collaborative engagement across the continuum of clinical care settings and healthcare disciplines during clinical pathway development
- Anticipated high rate of use of the clinical pathway

Bias Awareness

Our goal is to recognize social determinants of health and minimize healthcare disparities, while acknowledging that our unconscious biases can contribute to these disparities.

Clinical Pathway Preparation

This pathway was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Digital Ischemia Clinical Pathway Committee, composed of content experts at Children's Mercy.

Committee Members and Representation:

- Carlos Martinez, MD, MPH | Orthopedic Surgery | Committee Chair
- Caleb Grote, MD/PhD | Orthopedic Surgery | Committee Member
- Brian Haney, MSN, RN, CWCN, CPHQ | Wound, Ostomy Care | Committee Member
- Amy Kiser, OTR/L, CHT | Occupational Therapy | Committee Member
- Kelsey May, MSN, APRN, CPNP-AC/PC, CCRN | CICU | Committee Member
- Erica Molitor-Kirsch, MD | Critical Care Medicine | Committee Member
- Natalee Perrin, BSN, RN, CCRN | ICU Staff Nurse | Committee Member
- Angel Pope-Kirksey, PharmD | Clinical Pharmacist – PICU/CICU | Committee Member
- Nicolette Saddler, MSN, APRN, FNP-C, CPN | Orthopedic Surgery | Committee Member
- Neha Sinha, MD | Critical Care Medicine | Committee Member
- Danielle Thornburg, MD | Orthopedic Surgery | Committee Member
- Jordan Wilson, OTR/L | Occupational Therapist | Committee Member

EBP Committee Members

- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Kori Hess, PharmD | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Evidence Based Practice, Critical Care Medicine, Nursing, Orthopedic Surgery, Pharmacy, Physical and Occupational Therapy, and Wound & Ostomy Care Team.

Conflict of Interest

The contributors to the Digital Ischemia Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

Approval Process

- This pathway was reviewed and approved by the EBP Department and the Digital Ischemia Committee after committee members garnered feedback from their respective divisions/departments. It was then approved by the Medical Executive Committee.

Review Requested

Department/Unit	Date
Critical Care Medicine (PICU/CICU)	May 2026
ECMO Care Team	April 2026

Nursing (PICU)	April 2026
Orthopedic Surgery	April 2026
Physical and Occupational Therapy	April 2026
Pharmacy	May 2026
Wound, Ostomy Care Team	April 2026
Evidence Based Practice	April 2026

Version History

Date	Comments
May 2026	Version one – (development of algorithm and synopsis)

Date for Next Review

- May 2029

Implementation & Follow-Up

- Once approved, the pathway was implemented and presented to the appropriate care teams:
  - Announcements made to relevant departments
  - Additional institution-wide announcements were made via the hospital website and relevant huddles
- Care measurements may be assessed and shared with appropriate care teams to determine if changes need to occur.
- Pathways are reviewed every 3 years (or sooner) and updated as necessary within the EBP Department at Children's Mercy. Pathway committees are involved with every review and update.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the order set(s) that accompany the clinical pathway.

These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment to determine what is in the best interests of the patient based on the circumstances existing at the time.

It is impossible to anticipate all possible situations that may exist and to prepare clinical pathways for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.

References

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