



Catheter-Directed Thrombolysis Clinical Pathway Synopsis

Objective of Clinical Pathway

This pathway aims to minimize unnecessary variations in care and maximize patient safety for patients undergoing a thrombolysis procedure in interventional radiology.

Background

The incidence of pediatric thrombosis, arterial or venous, ranges between 2.6 and 6.4 cases per 100,000 per year (Betensky et al., 2022; Bhatt & Chan, 2021). Thrombosis occurs most often in very sick neonates and, increasingly, in children with prolonged hospitalization (Song et al., 2023; Thom et al., 2020). The Thrombolysis Clinical Pathway Committee developed this pathway to guide providers through each step of thrombolysis procedures, standardize care, and reduce process safety errors.

Target Users

- Physicians (Radiologists, Hematologists, Anesthesiologists, Critical Care, Residents, Fellows)
- Nursing (Sedation, Interventional Radiology)
- Pharmacists

Target Population

Inclusion Criteria

- Patients undergoing thrombolysis through interventional radiology

Practice Recommendations

Practice recommendations in the Thrombolysis Clinical Pathway are based on consensus among providers with knowledge of the existing evidence and expertise in evaluating, treating, and monitoring pediatric patients undergoing thrombolysis.

Additional Questions Posed by the Clinical Pathway Committee

No clinical questions were posed for this review.

Measures

- Error-free procedure set-up

Value Implications

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

- Decreased unwarranted variation in care

Organizational Barriers and Facilitators

Potential Barriers

- Variability of acceptable level of risk among providers

Potential Facilitators

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

Bias Awareness

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

** 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 in determining 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 a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.*



Order Sets

- There are no associated order sets with this clinical pathway

Clinical Pathway Preparation

This product was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Thrombolysis Clinical Pathway Committee, which is composed of content experts at Children's Mercy. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Thrombolysis Clinical Pathway Committee Members and Representation

- Viet Le, MD | Radiology | Committee Co-Chair
- Brenton Reading, MD | Radiology | Committee Co-Chair
- Chelsea Fox, MSN, APRN, CPNP-PC | Interventional Radiology | Committee Co-Chair
- Jay Rilinger, MD | Critical Care Medicine | Committee Member
- Lauren Amos, MD | Hematology/Oncology/BMT | Committee Member
- Ivy Martin, MSN, RN, CPN, CSCRN | Sedation | Committee Member
- Christopher Klockau, RPh, BCOP | Pharmacy | Committee Member

EBP Committee Members

- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Andrea Melanson, OTD, OTR/L | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Interventional Radiology, Critical Care Medicine, Hematology/Oncology, Anesthesia, Pharmacy, and Evidence Based Practice.

Conflict of Interest

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

Approval Process

- This product was reviewed and approved by the Thrombolysis Clinical Pathway Committee, Content Expert Departments/Divisions, and the EBP Department, after which they were approved by the Medical Executive Committee.
- Products are reviewed and updated as necessary every 3 years within the EBP Department at CM. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Approved
Interventional Radiology	June 2024
Critical Care Medicine	June 2024
Hematology/Oncology	June 2024
Sedation	June 2024
Pharmacy	June 2024
Evidence-Based Practice	June 2024

Version History

Date	Comments
June 2024	Version one – (Algorithm and synopsis created)

Date for Next Review

- June 2027

Implementation & Follow-Up

- Once approved, the pathway was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur.

** 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 in determining 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 a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.*



- Education was provided to all stakeholders:
 - Nursing units where the Thrombolysis Clinical Pathway is used
 - Department of Radiology, Critical Care Medicine, Hematology/Oncology, Sedation, and Pharmacy
 - Resident physicians
- Additional institution-wide announcements were made via email, the hospital website, and relevant huddles.
- Metrics will be assessed and shared with appropriate care teams to determine if changes need to occur.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the order sets(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 and prepare clinical pathways for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.

** 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 in determining 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 a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.*



References

- Betensky, M., Kulkarni, K., Rizzi, M., Jones, S., Brandão, L. R., Faustino, E. V. S., Goldenberg, N.A., & Sharathkumar, A. (2022). Recommendations for standardized definitions, clinical assessment, and future research in pediatric clinically unsuspected venous thromboembolism: Communication from the ISTH SSC Subcommittee on Pediatric and Neonatal Thrombosis and Hemostasis. *J Thrombosis Haemostasis*, 20(7), 1729–34. <https://doi.org/10.1111/jth.15731>
- Bhatt, M.D., & Chan, A.K. (2021). Venous thrombosis in neonates. *Faculty reviews*, 10, 20. <https://doi.org/10.12703/r/10-20>
- Song, S., Li, Z., Zhao, G., Li, X., Wang, R., Li, B., & Liu, Q. (2023). Epidemiology and risk factors for thrombosis in children and newborns: systematic evaluation and meta-analysis. *BMC Pediatrics*, 23(1), 292. <https://doi.org/10.1186/s12887-023-04122-x>
- Thom, K., Lensing, A. W. A., Nurmeev, I., Bajolle, F., Bonnet, D., Kenet, G., Massicotte, M. P., Karakas, Z., Palumbo, J. S., Saracco, P., Amedro, P., Chain, J., Chan, A. K., Ikeyama, T., Lam, J. C. M., Gauger, C., Pap, Á. F., Majumder, M., Kubitza, D., . . . investigators, f. t. E.-J. C.-V. (2020). Safety and efficacy of anticoagulant therapy in pediatric catheter-related venous thrombosis (EINSTEIN-Jr CVC-VTE). *Blood Advances*, 4(19), 4632–4639. <https://doi.org/10.1182/bloodadvances.2020002637>

* 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 in determining 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 a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.