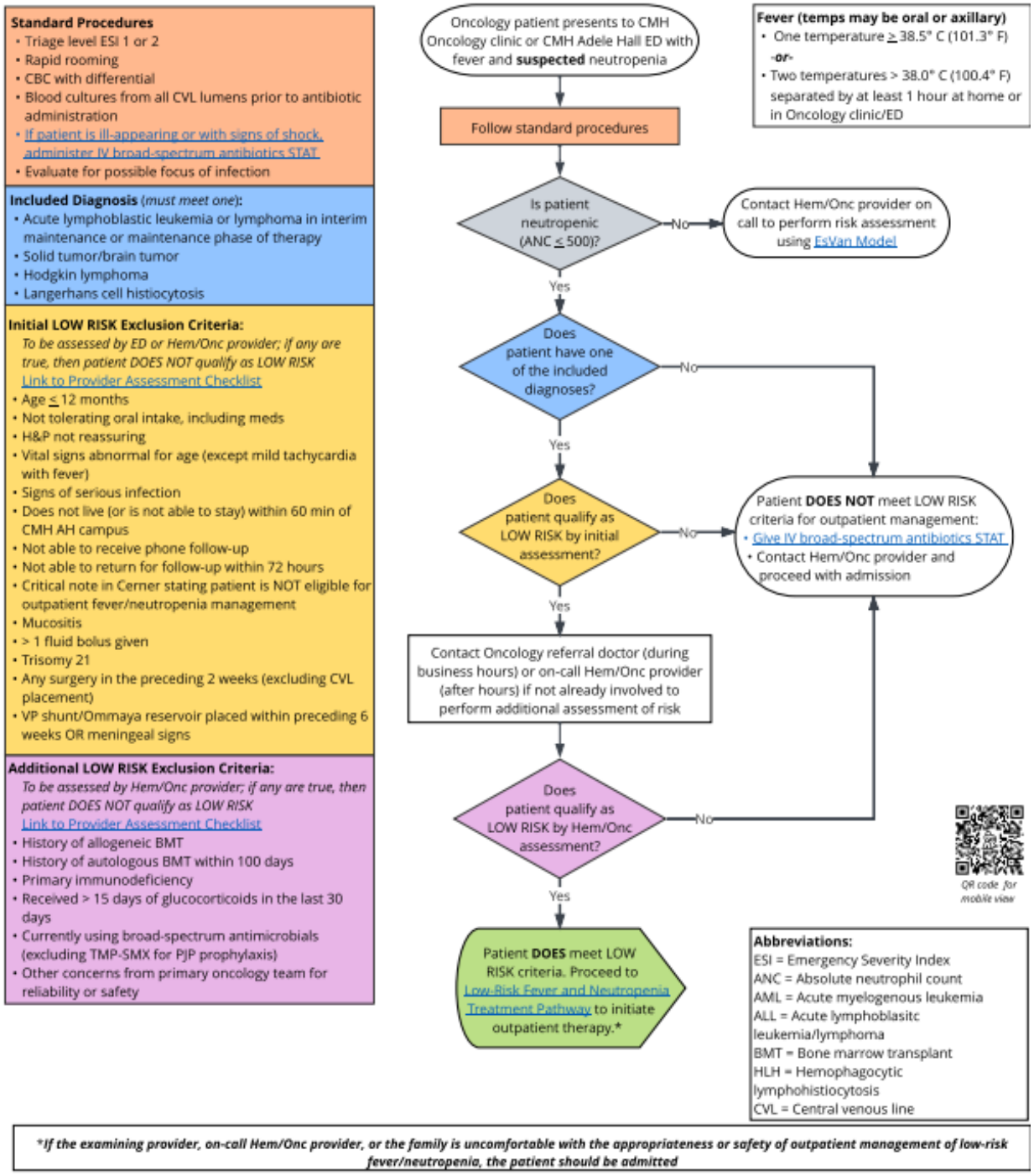
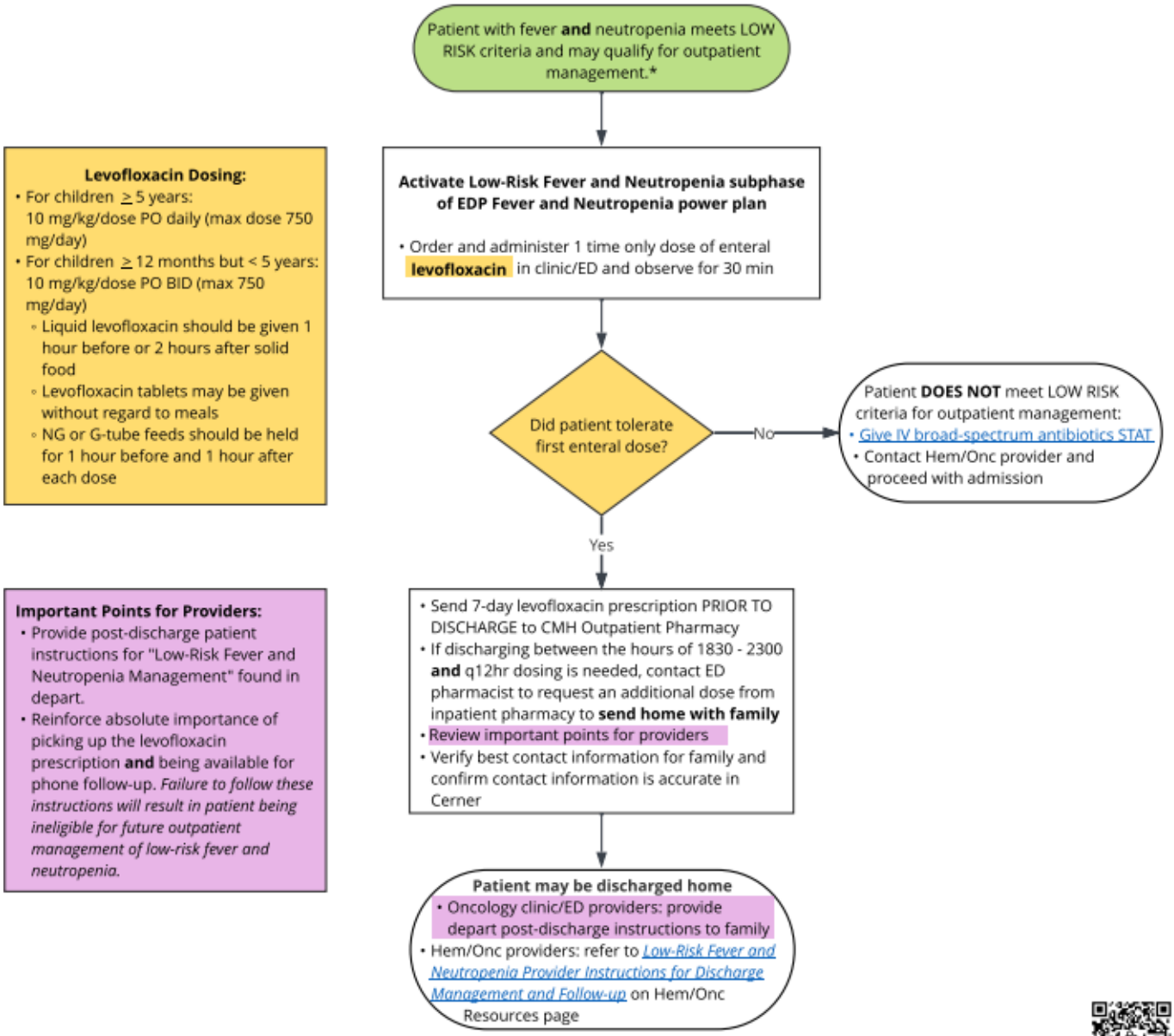
Febrile Oncology Patient
Clinical Pathway Synopsis

Febrile Oncology Patient Evaluation Algorithm



** These products 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 guidelines for each. Accordingly, these products should guide care with the understanding that departures from them may be required at times.*

Low-Risk Fever and Neutropenia Treatment Algorithm



QR code for mobile view

If the examining provider, on-call Hem/Onc provider, or the family is uncomfortable with the appropriateness or safety of outpatient management of low-risk fever/neutropenia, the patient should be admitted If the rounding inpatient team the next day judges that the patient meets the above criteria, the patient may be discharged with a prescription for levofloxacin and follow-up as above.

Each primary oncology team MUST place a Critical Note in Cerner for any patient that they feel would NOT be eligible for outpatient management of low-risk fever and neutropenia despite meeting the Diagnosis and Clinical criteria. Ideally, each primary oncology team will place a Critical Note in Cerner for every patient stating definitively whether or not they would be eligible for outpatient management of low-risk fever and neutropenia

Table of Contents

Objective of Clinical Pathway

To provide care standards for pediatric oncology patients who present with fever and suspected neutropenia and may qualify for outpatient management. The pathway provides guidance regarding recommended evaluation, treatment, disposition, and follow-up for patients in order to maximize patient safety and minimize variation in care.

Epidemiology

Fever and chemotherapy-induced neutropenia is one of the most common complications of cancer therapy and is associated with a documented bacterial bloodstream infection in 11-30% of cases (te Poele et al., 2009). Assessment of risk for bacterial infections in fever and neutropenia allows clinicians to tailor therapy to the patient's risk. Empiric parenteral antimicrobial therapy and hospitalization are recommended for those patients at greatest risk of infection. For those at low risk of infection, less-intense upfront or step-down therapy may be appropriate. Such studies have been published since the 1990s, with assessment moving to earlier time points in the clinical course of fever and neutropenia (Ojha et al., 2018; te Poele et al., 2009; Villanueva & August, 2016; Wacker et al., 1997). More recently, a validated risk stratification tool has been published to assist with classifying non-neutropenic febrile oncology patients as well (Esbenshade et al., 2015; Esbenshade et al., 2017).

Current clinical practice guidelines for management of fever and neutropenia in pediatric patients suggest "initial or step-down outpatient management" of low-risk patients when close follow-up can be assured, but do not comment on how to determine which patients are low-risk (Lehrnbecher et al., 2017). The Febrile Oncology Patient Clinical Pathway combines current evidence with expert consensus to define the optimal method of identifying, stratifying, and treating pediatric cancer patients who present with fever and suspected neutropenia.

Target Users

- Physicians (Emergency Medicine, Hematology/Oncology, Fellows, Residents)
- Nurse Practitioners
- Nurses
- Pharmacy

Target Population

Inclusion Criteria

- Oncology patients presenting to Oncology Clinic or Adele Hall Emergency Department (ED) with fever and *suspected* neutropenia

Practice Recommendations

Practice recommendations in the clinical pathway above are based on consensus among providers with knowledge of the existing evidence and expertise in the evaluation, treatment, and monitoring of pediatric oncology patients with fever and neutropenia.

Additional Questions Posed by the Committee

No clinical questions were posed for this review.

Updates from Previous Versions of the Clinical Pathway

This is the first version of this clinical pathway.

Measures

- Utilization of the Febrile Oncology Patient Clinical Pathway
- Utilization of Fever and Neutropenia power plans
- Utilization of the Low-Risk Fever and Neutropenia power plan subphase
- Number of Hem/Onc patients discharged home on levofloxacin
- Number of Hem/Onc patients who are discharged home, but later found to have invasive bacterial infection

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 while reducing costs and improving resource utilization for healthcare facilities.

- Decreased risk of overtreatment (i.e., prolonged exposure to broad spectrum IV antibiotics)
- Decreased frequency of admission
- Decreased unwarranted variation in care

Potential Organizational Barriers and Facilitators

Potential Barriers

- Variability of an acceptable level of risk among providers and families
- Challenges with follow-up faced by some families

Potential Facilitators

- Collaborative engagement across care continuum settings during pathway development
- High rate of use of clinical pathways by providers in the organization
- Associated provider tools including Provider Assessment Checklist
- Standardized order set for Emergency Department and Hematology/Oncology Clinic

Diversity/Equity/Inclusion

Our aim is to provide equitable care. These issues were discussed with the committee prior to making any practice recommendations.

Power Plans

- EDP Fever & Suspected Neutropenia ED and Hem/Onc Clinic Standing Orders
- EDP Fever & Neutropenia
- EDP Quick Discharges
    - Low Risk Fever and Neutropenia Pathway (1-5 years of age)
    - Low Risk Fever and Neutropenia Pathway (Greater than 5 years of age)
- Fever & Neutropenia
- Low-Risk Fever and Neutropenia (subphase)

Associated Policies

- Fever and Suspected Neutropenia Standing Orders Policy
- Dispensing Prescriptions Outside of Normal Outpatient Pharmacy Business Hours

Education Materials

- The Febrile Oncology Patient Clinical Pathway has no associated educational materials.

Clinical Pathway Preparation

This product was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Febrile Oncology Patient Clinical Pathway Committee composed of content experts at Children's Mercy Kansas City. The development of this product supports the Quality Excellence and Safety initiative to promote care standardization that is evidenced by measured outcomes. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Clinical Pathway Committee Members and Representation

- Joel Thompson, MD | Hematology/Oncology/BMT Department | Committee Chair
- Karen Lewing, MD | Hematology/Oncology/BMT Department | Committee Member
- Lindsey Fricke, RN, MSN, FNP-BC, CPHON | Hematology/Oncology/BMT Department | Committee Member
- Leslie Hueschen, MD | Emergency Department | Committee Member
- Stephanie Clark, MD | Emergency Department | Committee Member

EBP Committee Members

- Kathleen Berg, MD, FAAP | Evidence Based Practice
- Kori Hess, PharmD | Evidence Based Practice
- Kelli Ott, OTD, OTR/L | Evidence Based Practice

Clinical Pathway Development Funding

The development of this pathway was underwritten by the following departments/divisions: Emergency Medicine, Hematology/Oncology/BMT, Clinical Practice and Quality, and Evidence Based Practice.

Conflict of Interest

The contributors to the Febrile Oncology Patient Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed in this care process.

Approval Process

- This product was reviewed and approved by the Febrile Oncology Patient 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 CMKC. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Obtained
Emergency Department	January 2025
Hematology/Oncology/BMT	January 2025
Pharmacy, Infectious Diseases	October 2023
Evidence Based Practice	January 2025

Version History

Date	Comments
October 2023	Version one (algorithms and synopsis developed and power plans updated)
January 2025	Version two (minor process changes including addition of EsVan Model for risk stratification and disposition)

Date for Next Review

- 2028

Implementation & Follow-Up

- Once approved, the pathway was presented to appropriate care teams and implemented.
- Order sets/power plans consistent with recommendations were created or updated for each care setting.
- Depart education materials were reviewed by health literacy.
- Additional institution-wide announcements were made via email, 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 power plan(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 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 clinical pathways for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.

References

Esbenshade, A. J., Pentima, M. C., Zhao, Z., Shintani, A., Esbenshade, J. C., Simpson, M. E., Montgomery, K. C., Lindell, R. B., Lee, H., Wallace, A., Garcia, K. L., Moons, K. G., & Friedman, D. L. (2015). Development and validation of a prediction model for diagnosing blood stream infections in febrile, non-neutropenic children with cancer. *Pediatr Blood Cancer*, *62*(2), 262-268. https://doi.org/10.1002/pbc.25275

Esbenshade, A. J., Zhao, Z., Aftandilian, C., Saab, R., Wattier, R. L., Beauchemin, M., Miller, T. P., Wilkes, J. J., Kelly, M. J., Fernbach, A., Jeng, M., Schwartz, C. L., Dvorak, C. C., Shyr, Y., Moons, K. G. M., Sulis, M. L., & Friedman, D. L. (2017). Multisite external validation of a risk prediction model for the diagnosis of blood stream infections in febrile pediatric oncology patients without severe neutropenia. *Cancer*, *123*(19), 3781-3790. https://doi.org/10.1002/cncr.30792

Lehrnbecher, T., Robinson, P., Fisher, B., Alexander, S., Ammann, R. A., Beauchemin, M., Carlesse, F., Groll, A. H., Haeusler, G. M., Santolaya, M., Steinbach, W. J., Castagnola, E., Davis, B. L., Dupuis, L. L., Gaur, A. H., Tissing, W. J. E., Zaoutis, T., Phillips, R., & Sung, L. (2017). Guideline for the Management of Fever and Neutropenia in Children With Cancer and Hematopoietic Stem-Cell Transplantation Recipients: 2017 Update. *J Clin Oncol*, *35*(18), 2082-2094. https://doi.org/10.1200/jco.2016.71.7017

Ojha, R. P., Asdahl, P. H., Steyerberg, E. W., & Schroeder, H. (2018). Predicting bacterial infections among pediatric cancer patients with febrile neutropenia: External validation of the PICNICC model. *Pediatr Blood Cancer*, *65*(4). https://doi.org/10.1002/pbc.26935

te Poele, E. M., Tissing, W. J., Kamps, W. A., & de Bont, E. S. (2009). Risk assessment in fever and neutropenia in children with cancer: What did we learn? *Crit Rev Oncol Hematol*, *72*(1), 45-55. https://doi.org/10.1016/j.critrevonc.2008.12.009

Villanueva, M. A., & August, K. J. (2016). Early Discharge of Neutropenic Pediatric Oncology Patients Admitted With Fever. *Pediatr Blood Cancer*, *63*(10), 1829-1833. https://doi.org/10.1002/pbc.26072

Wacker, P., Halperin, D. S., Wyss, M., & Humbert, J. (1997). Early hospital discharge of children with fever and neutropenia: a prospective study. *J Pediatr Hematol Oncol*, *19*(3), 208-211. https://doi.org/10.1097/00043426-199705000-00006