



Children's Hospital of Orange County
Best Evidence and Recommendations (BEaR)

Febrile Neutropenic Patients Presenting to the Emergency Department with a Port-A-Cath

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Abstract

Febrile neutropenia is a potentially life-threatening complication of cancer treatment in children and adolescents. Decreasing time-to-antibiotic administration is associated with improved outcomes and has become an essential quality of care measurement. While this clinician-determined outcome is critical, families are arguably the best source in assessing the quality of care and identifying how care can be improved. This project aimed to explore best practices to ensure safe and timely port-a-cath access for pediatric oncology patients in the emergency department (ED). Outcomes important to patients and families seeking care in the ED were included. Based on this review, recommendations for current practice were formulated.

Keywords

Oncology, port-a-cath access, best practice, patient satisfaction, process improvement, reducing needle trauma, infection prevention

PICO(T)

In pediatric oncology patients presenting to the emergency department for treatment, what are the best practices in implanted port (port-a-cath) access to enhance patient safety and patient/family satisfaction?

Background and Significance

It is estimated that up to 50% of children and adolescents with cancer seek emergency department services during treatment, with the most common medical concern being fever. Febrile immunocompromised patients account for 0.2% of the total visits at the CHOC Emergency Department. Rapid antibiotic administration for these patients is critical. Current guidelines specifically target immediate identification and isolation of a patient at presentation, rapid triage, and antibiotic administration within 60 minutes of arrival. Despite efforts over the



years to meet the standard of time-to-antibiotic (TTA) delivery within 60 minutes of arrival, audits reveal inconsistent time-to-antibiotics in our pediatric emergency department associated with bedside indwelling port access delays. Due to the typical turnover in nurse staffing and the high volumes of diverse patient populations seen in the ED, there is a wide range of nurse experience and confidence with the port access procedure. Additionally, the inpatient and outpatient oncology nurses frequently hear patient and family testimonials of traumatic port access in the emergency department. Complaints include multiple attempts for port access and the use of inappropriate dressings. Parents share concerns that multiple access attempts put their children at additional risk for infection. As a result, families frequently request that a pediatric oncology nurse come to the ED to access their port.

Improving port-a-cath access in the ED would decrease the TTA, lower rates of hospital-acquired infection and sepsis, and reduce healthcare-induced trauma. Ultimately, these efforts would enhance patient safety and improve patient and family satisfaction.

Framework

This EBP project utilizes the “Translating Evidence into Practice: CHOC’s Approach to EBP” model, adapted from the EBPI Model © 2007 Brown & Ecoff (Ecoff, Stichler & Davidson, 2020)

Search for the Evidence

Databases and search engines utilized for this review included Google Scholar and PubMed. Keywords: Oncology, neutropenia, port-a-cath access, best practice, performance improvement, healthcare-induced trauma, pediatric trauma prevention, time to antibiotic protocol, pediatric emergency visits. This search yielded 33 articles; 7 were relevant to this project.

Critical Appraisal and Synthesis of the Evidence

- Sepsis prevention is crucial in this patient population and is a concern that is needed to drive the care they receive. “Patients with febrile neutropenia are at a high risk for morbidity and mortality from infectious causes” (Cohen, 2016, p. 1).
- “Rapid antimicrobial administration is becoming a universal goal due to the evidence that rapid antibiotic administration can improve outcomes” (Cohen, 2016, p. 2).
- Reducing trauma in pediatric patients whenever possible is critically important. Healthcare-induced trauma that this population of patients undergoes and the potential longstanding effects of that trauma; however, the suggestions for practice change in trauma prevention were lacking (Lerwick, 2016).
- Children's Minnesota developed the “Children's Comfort Promise,” a standard of care for needle procedures that requires staff to offer four strategies consistently: (1) topical anesthetics, (2) sucrose or breastfeeding for infants 0 to 12 months, (3) comfort positioning



(including swaddling, skin-to-skin, or facilitated tucking for infants; sitting upright for children), and (4) age-appropriate distraction (Friedrichsdorf et al., 2018).

- Organizations such as Boston Children’s Hospital and the Department of Pediatrics at the University of Alabama have successfully reduced their TTA among febrile neutropenic patients by implementing patient care guidelines and standardized order sets. Formalized standard practices streamline the planning and initiation of care.
- While the ED provides necessary and timely assessment and treatment, the system may benefit from improving outcomes most important to children and families with cancer (Mueller et al., 2020).

Practice Recommendations

Oncology patients presenting in the ED who are febrile and neutropenic are seen as a medical emergency, and the risk for sepsis is high. Prioritizing TTA and sepsis prevention needs to be a constant focus and goal by utilizing a standardized, actionable, and trackable approach. In addition, preventing pediatric healthcare-induced trauma is an emerging topic and one in which ongoing interventions will improve patient and family satisfaction.

- Applying the CHOC Model for Improvement, develop a comprehensive quality improvement initiative for port-a-cath access in the emergency department.
 - Identify multidisciplinary stakeholders and key role map
 - Create a current state process map and identify carriers
 - Develop a fishbone diagram to identify cause and effect
 - Establish key drivers
 - Engage nurses in the voice of the customer
 - Conduct a focus group with patients and families using techniques such as experience mapping and love letter/break-up letter (Mueller et al., 2020) to explore what’s working well and where there are opportunities for improvement.
 - Agree upon measurement strategy.
 - Analyze baseline data.
 - Develop SMART goals.
- Based on the evidence, cycles of improvement to consider include:
 - Implement standardized order sets and patient care guidelines for port access and treatment of fever.
 - Establish port access “Super Users” to cover all shifts, which will increase ED associate skill and comfort (Jizba, 2021).
 - Implement an emergency nurse-led port access clinical algorithm (Jizba, 2021).
 - Review and revise the port-a-cath policy (last revised in 2020).
 - Revise sepsis policy to include more sepsis prevention.
 - Develop a Passport/Red Card for patients to present when arriving at the ED with a fever (Phoenix Children’s Hospital).



- Educate families on oncologic emergencies such as: What is sepsis? What can you expect when you come to the ED with a fever? Applying numbing cream before arriving
- Make procedural trauma prevention an essential part of care (Lerwick 2016; Walz, 2013).
- Improve communication between the ED team and the oncology team
- Implement the comfort promise- ensure appropriate pain management, procedural distraction techniques, and developmentally appropriate speech are used with each port access (Friedrichsdorf et al., 2018).

Outcome Measures

- Outcome measure: TTA for febrile neutropenic patients within 60 minutes of arrival to ED (Cohen, 2016).
- Process measure: i.e., Number of access attempts, time to labs sent, order set used?
- Balancing measure: Patient and family satisfaction scores, Rates of sepsis admission, ED length of stay, clinical deteriorations?

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References

- Cohen, C., King, A., Lin, C. P., Friedman, G. K., Monroe, K., & Kutny, M. (2016). Protocol for reducing time to antibiotics in pediatric patients presenting to an emergency department with fever and neutropenia: Efficacy and barriers. *Pediatric Emergency Care*, 32(11), 739-745. <https://doi.org/10.1097/PEC.0000000000000362>
- Ecoff, L., Stichler, J.F., & Davidson, J.E. (2020). Design, implementation and evaluation of a regional evidence-based practice institute. *Applied Nursing Research*, 55(2), 151300. doi: 10.1016/j.apnr.2020.151300
- Friedrichsdorf, S. J., Eull, D., Weidner, C., & Postier, A. (2018). A hospital-wide initiative to eliminate or reduce needle pain in children using lean methodology. *Pain Reports*, 3(Suppl 1).
- Jizba, T. A., Baumert, J. M., Miller, J., & Barnason, S. (2021). Implanted port access in the emergency department: a unit-level feasibility study of a nurse-led port access algorithm. *Journal of Emergency Nursing*, 47(4), 599-608.



- Lerwick, J. L. (2016). Minimizing pediatric healthcare-induced anxiety and trauma. *World Journal of Clinical Pediatrics, 5*(2), 143-150. <https://doi.org/10.5409/wjcp.v5.i2.143>
- Mueller, E. L., Cochrane, A. R., Moore, C. M., Jenkins, K. B., Bauer, N. S., & Wiehe, S. E. (2020). Assessing needs and experiences of preparing for medical emergencies among children with cancer and their caregivers. *Journal of Pediatric Hematology/Oncology, 42*(8), e723.
- Mueller, E. L., Cochrane, A. R., Lynch, D. O., Cockrum, B. P., & Wiehe, S. E. (2019). Identifying patient-centered outcomes for children with cancer and their caregivers when they seek care in the emergency department. *Pediatric Blood & Cancer, 66*(10), e27903. <https://doi.org/10.1002/pbc.27903>
- Pai, A.L. & Kazak, A. (2006). Pediatric medical traumatic stress in pediatric oncology: Family systems interventions. *Current Opinion in Pediatrics, 18*(5), 558-562. doi: 10.1097/01.mop.0000245358.06326.e9