A Clinical Pathway to Reduce Unnecessary Antibiotic Use in Febrile Oncology Patients Without Severe Neutropenia

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Background

- Febrile pediatric oncology patients are at high risk for sepsis, often prompting empiric use of broad-spectrum antibiotics.
- Recent evidence fails to support the historic 1-hour window for antibiotics in well-appearing patients, allowing time to tailor therapy.

Objective

To decrease the percentage of febrile oncology patients without severe neutropenia (ANC ≥ 500) who receive empiric cefepime in the pediatric emergency department (PED) from 92% to 60% within 10 months.

Measures

Outcome:
- Percentage of febrile oncology patients without severe neutropenia who received cefepime

Process:
- Order set usage
- Frequency of antibiotics administered before ANC resulted

Balancing:
- Readmission within 7 days
- Admission to ICU within 24 hours of ED discharge
- Percentage of patients receiving antibiotics > 3 hours after ED arrival

Interventions

PDSA 1	08/2024	**Revised clinical pathway and order set to recommend awaiting ANC prior to antibiotics for well-appearing patients.** Removed antibiotics from nurse standing orders.
PDSA 2	09/2024	Provided Maintenance of Certification (MOC) credit for physicians for project participation.
PDSA 3	10/2024	Developed talking points for families regarding process change.
PDSA 4	11/2024	**Revised clinical pathway and order set, adding EsVan Model* to risk stratify patients without severe neutropenia.**
PDSA 5	02/2025	Added outcome measures to daily huddle board. Implemented critical information notes. Expanded talking points script.
PDSA 6	08/2025	Added priority labels to blood summitted to lab to expedite ANC results.

*Zhao, Z., Patel, P. A., Slatnick, L., Sitthi-Amorn, A., Bielamowicz, K. J., Nunez, F. A., Walsh, A. M., Hess, J., Rossoff, J., Elgarten, C., Myers, R., Saab, R., Basbous, M., McCormick, M., Aftandilian, C., Richards, R., Nessle, C. N., Tribble, A. C., Sheth Bhutada, J. K.,…Esbenshade, A. J. (2024). Prospective External Validation of the Esbenshade Vanderbilt Models Accurately Predicts Bloodstream Infection Risk in Febrile Non-Neutropenic Children With Cancer. *J Clin Oncol*, *42*(7), 832-841.

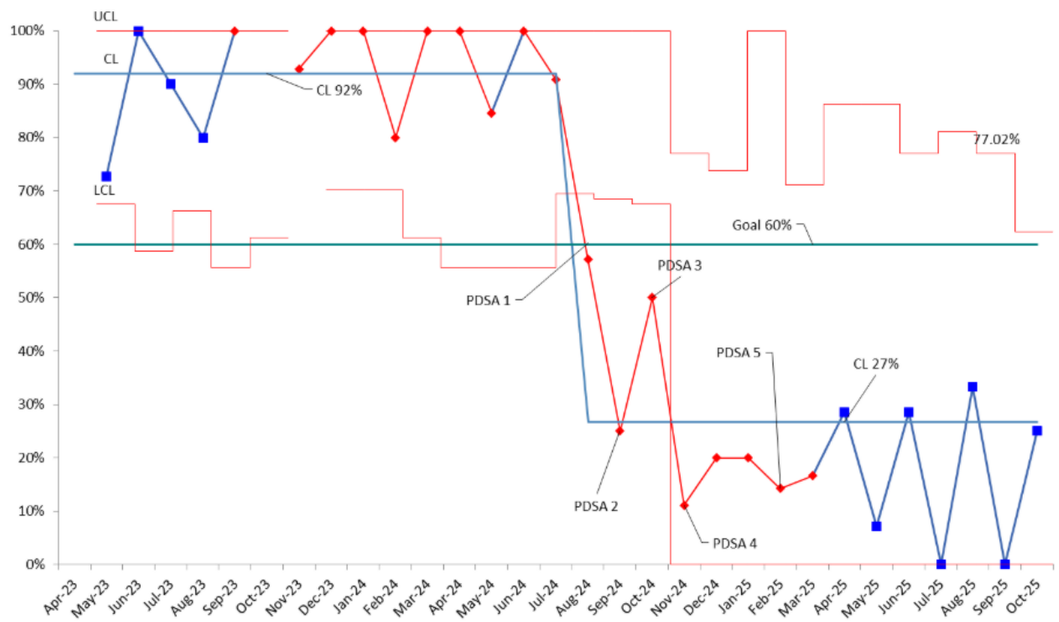

Figure 1: Outcome Measure: Percentage of febrile oncology patients without severe neutropenia receiving cefepime in the PED (p-chart)

EsVan Model with Children's Mercy Recommended Management

Minimal Risk
Predicted Risk < 10% Discharge with no antibiotic and strict follow-up
Intermediate Risk
Predicted Risk 10 - < 40% Administer ceftriaxone and discharge home
High Risk
Predicated Risk ≥ 40% Administer cefepime and admit for observation

Results

Outcome:
- Following clinical pathway and order set changes, cefepime use in non-neutropenic patients decreased from 92% to 26.8% (Fig 1)

Process:
- Order set usage decreased from 82% to 52.7% in September 2024
- Antibiotics administered prior to ANC result decreased from 90% to 60.9% in October 2024

Balancing:
- IV antibiotics administered > 3 hours after arrival increased from 2.3% to 29% in September 2024
- Remaining balancing measures did not change

Conclusion

Implementation of a new clinical pathway with a corresponding order set improved antibiotic stewardship in febrile oncology patients. This exemplifies the role of clinical pathways in decreasing unwarranted variation and promoting high value care.

Created with Patients and Families

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