# Decreasing Time to Antibiotic Delivery for Febrile Immunocompromised Patients in a Pediatric Emergency Department

Allison Ast, M.D., Jennifer Light, M.D., William Slayton, M.D., Erik Black, Ph.D., Carolyn Holland, M.D.

UF Health — University of Florida Health

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## BACKGROUND

Infections are common complications in immunocompromised patients (ICPs). Morbidity and mortality are increased in ICPs with fever if antibiotics are not received in a timely manner. Although the causes of fever in ICP's can be many, the risk of severe bacterial infection makes rapid detection and urgent intervention essential. It is recommended that patients have prompt evaluation for source of infection and rapid initiation of empirical broad spectrum intravenous antibiotics. The Infectious Diseases Society of America has recommended that antibiotic therapy be administered promptly to these patients but no specific time window has been recommended. The nationwide consensus amongst institutions is delivery of antibiotics in 60 minutes or less.

## PURPOSE

We designed a quality improvement project to reduce antibiotic delivery time to less than 60 minutes for all febrile immunocompromised patients presenting to the pediatric emergency department (ED).

## METHODS

**ICP QUALIFYING CONDITIONS**

- Cancer
- Bone Marrow Transplant-within last year or taking immunosuppressive therapy within last 6 months
- Anyone on immunosuppressive therapy
- Asplenic
- Sickle Cell
- Solid Organ Transplant-within last 6 months or taking immunosuppressive therapy within last 3 months
- Immune Deficiency-congenital or acquired

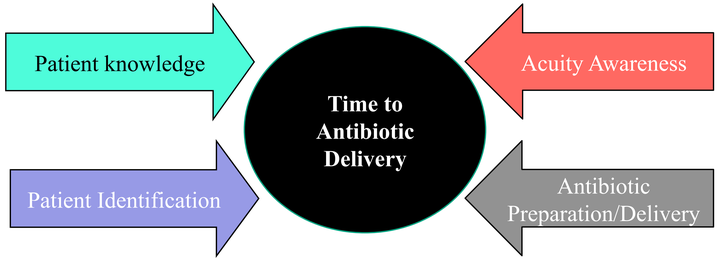


**Figure 1: Key drivers to decrease time to antibiotic delivery**

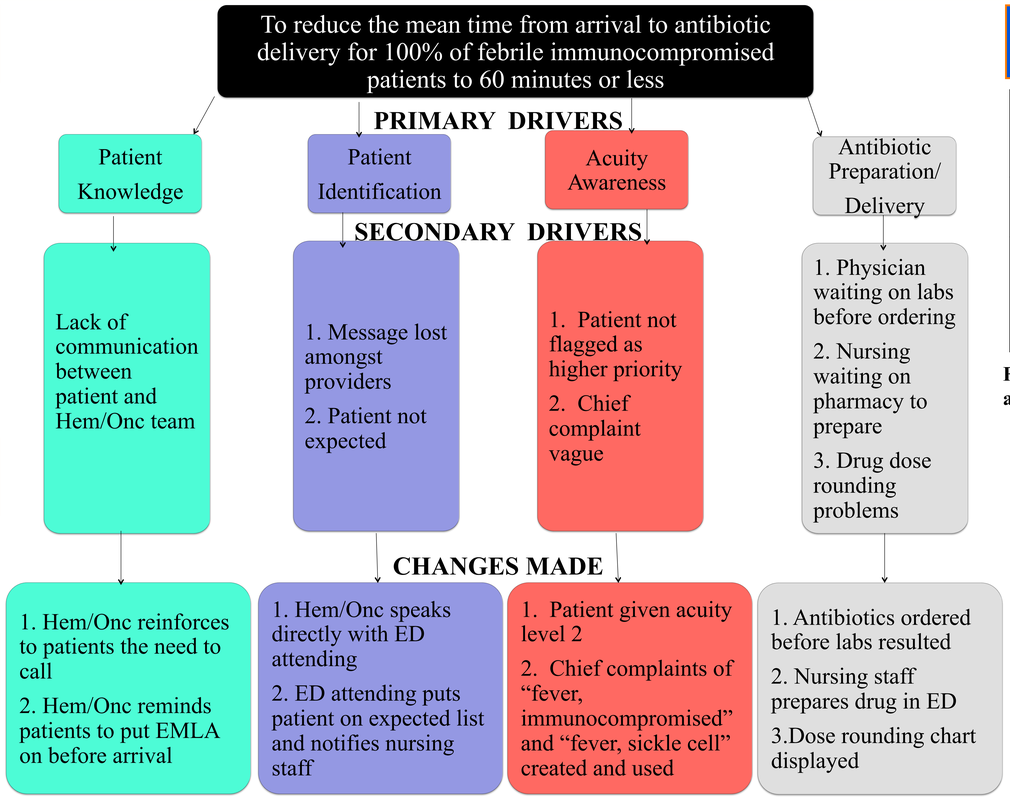


**Figure 2: Primary and secondary drivers and changes implemented to decrease time to antibiotic delivery**

## MEASURES

Two key measures used to evaluate the effectiveness of interventions included mean time to antibiotic delivery in febrile ICPs and the percentage of febrile ICPs meeting the target for time to antibiotic administration. Data was collected and abstracted from the hospital electronic medical record for the twelve months prior to the intervention and four months following the intervention. During the pre- intervention period the ED saw, on average, 14 febrile ICPs (range: 10-19 monthly. During the post-intervention period, the ED saw, on average, 15 febrile ICPs (range: 8-19) monthly

## BENCHMARKS

| Category | Pre-Implementation (September 2012-September 2013) | Post-Implementation (September 1, 2013-February 24, 2013) | Percentage Change |
|---|---|---|---|
| Average time to antibiotics (min) | 93.32 | 35.83 | ↓ 61.6 |
| # ICP's receiving antibiotics in 60 minutes or less | 56/138 (33.3%) | 87/90 (96.6%) | ↑ 63.3 |

**Figure 3: Pre and Post-implementation results for average time to antibiotics and number of patients meeting benchmark**

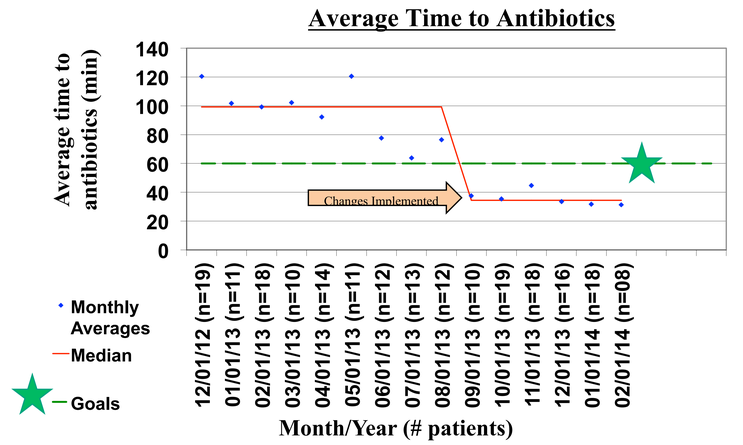


**Figure 4: Run Chart of average time to antibiotics in the pre and post-implementation phases**

## CONCLUSIONS

Our study demonstrates that education of healthcare providers and standardization of a process of care reduced antibiotic delivery time for febrile ICPs. Timely delivery of antibiotics can be achieved through implementation of patient education, a treatment algorithm and staff buy in. Administering antibiotics in less than one hour is feasible and should become the standard of care for all febrile ICPs.