

## Electronically-augmented Huddle Improved Antibiotic Delivery for Sepsis in the Pediatric Intensive Care Unit

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**Background:** Delayed antimicrobial therapy is an independent risk factor for mortality and prolonged organ dysfunction in sepsis. Barriers to timely antibiotic administration include lack of situational awareness about medication status and inconsistent communication with ordering clinicians. **Objectives:** The specific aim of this project was to achieve antibiotic administration within 60 minutes of order for ≥ 70% of suspected sepsis episodes in pediatric intensive care unit patients.

**Methods:** In the 55-bed pediatric intensive care unit of an academic referral center, a standardized workflow to decrease antibiotic administration time for patients with suspected sepsis was iteratively implemented from 2012 to 2017. An electronic order set (phase 1) and best practice alert for “stat” antibiotic ordering (phase 2) were combined with a scripted multidisciplinary bedside “sepsis huddle” (phase 3). Subsequently, a bedside, 1-touch electronic notification button was introduced (phase 4), which triggered automated phone alerts to the clinical team until antibiotic administration was complete (Fig. 1).

**Results:** There was a progressive decrease in time from antibiotic order to administration from phase 1 through 4 (Table 1; Fig. 2). This improvement has been sustained, with ≥ 70% of suspected sepsis episodes meeting goal antibiotic administration time for 12 months following phase 4. On-time administration was more likely for episodes with versus without a huddle (90% versus 70%).

**Conclusions/Implications:** Combining automated, timed reminders with a multidisciplinary huddle improved situational awareness about challenges to timely antibiotic delivery and decreased time to administration for critically ill children with suspected sepsis. Follow-up work includes integrating the 1-touch notification process into an automated sepsis recognition algorithm.



Antibiotic Name: \_\_\_\_\_ (Patient Label)

(Prioritize beta-lactam/cephalosporin over Vancomycin in most cases)

**Goal administration time is** \_\_\_\_\_ : \_\_\_\_\_  
(Should be within 60 minutes of order)

Actual administration time \_\_\_\_\_

**Blood Pressure Goal:** \_\_\_\_\_

- Were the antibiotics ordered STAT and/or through the Sepsis Pathway?
  - Yes
  - No- if no, should they?
- Do you have IV access issues?
  - No
  - Yes- if yes, have you considered IM administration?
- Do you know which IV/lumen you can use to administer the antibiotic?
  - Yes
  - No- if no, is it due to incompatibility or lack of available lumens? Can an IM or IVP antibiotic be ordered?
- Do you need blood cultures before starting ABX?
  - No
  - Yes- if yes, are you able to draw from line(s) Before the 60 minute mark? If not, consider Peripheral stick by FLOC?
- Do you have competing nursing priorities?
  - No
  - Yes- if yes, speak with CRN or charge and Delegate appropriate tasks

Antibiotic	OK to IV push over 5 minutes	OK to give IM
Ampicillin		✓
Aztreonam	✓	
Cefepime	✓	✓
Cefotaxime	✓	
Ceftriaxone	✓	✓
Clindamycin		✓
Geosulfon		✓
Meropenem	✓	

Please print:  
 Bedside RN: \_\_\_\_\_  
 Charge Nurse/CRN: \_\_\_\_\_  
 Attending/Fellow/FLOC: \_\_\_\_\_  
 Date: \_\_\_\_\_ Please return to Lauren Biedron's mailbox  
 Comments: \_\_\_\_\_

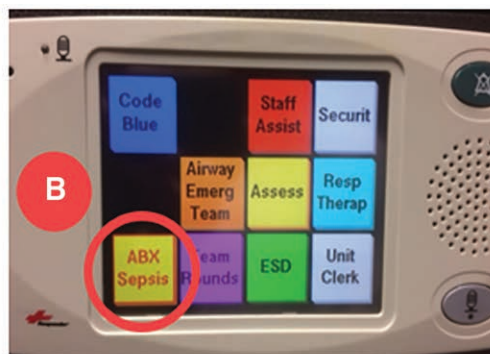


Fig. 1. A, Sepsis huddle script. B, One-touch notification button. C, Alert to clinician.

**TABLE 1.**

**Improvement in Antibiotic Administration with Each Phase of Intervention**

Phase	Intervention	% of Episodes Meeting Goal Time
1	Electronic order set only	39 (1,250 episodes)
2	Electronic order set + huddle script	58 (609 episodes)
3	Electronic order set+ huddle script + best practice alert	74 (427 episodes)
4	Electronic order set + huddle script + BPA + 1-touch notification alert	77 (442 episodes)

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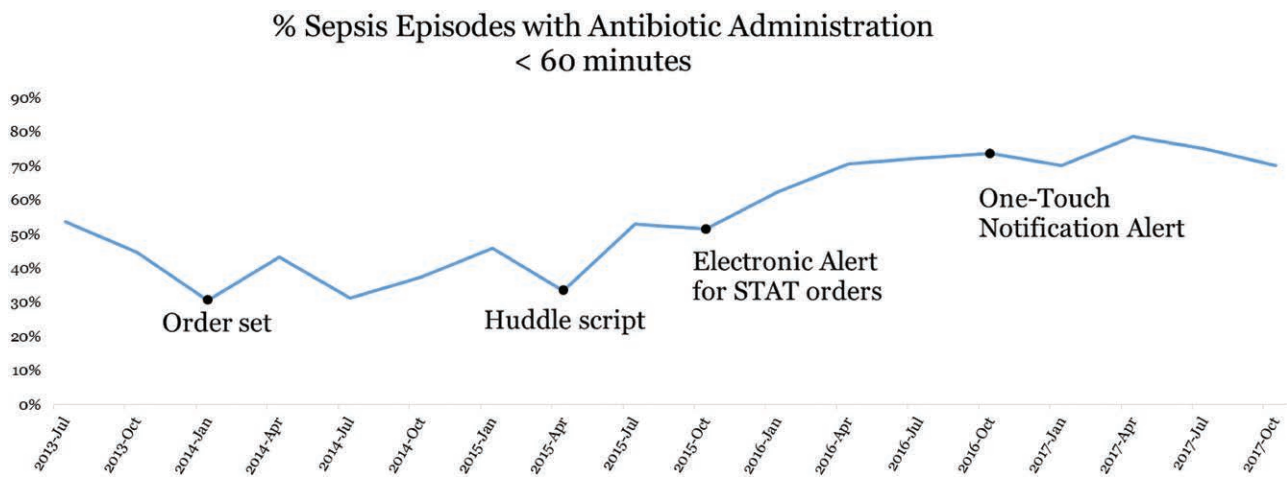
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**Fig. 2.** Percentage of suspected sepsis episodes meeting goal antibiotic administration time during phases 1–4.