

## Patient Safety Tip of the Week

April 23, 2024

### Prompting Improves Antibiotic Stewardship

Inappropriate use of antimicrobials can give rise to bacterial antibiotic resistance, allergies, complications like diarrhea and *C. difficile* infections, and unnecessary healthcare expenses. So, antibiotic stewardship is important in hospitals and other healthcare venues.

Results just published from the INSPIRE (Intelligent Stewardship Prompts to Improve Real-time Empiric Antibiotic Selection) clinical trials are very encouraging for use of prompts in CPOE as a way to improve antibiotic selection.

The INSPIRE Pneumonia Trial cluster-randomized trial comparing the effect of routine antibiotic stewardship vs. the INSPIRE CPOE stewardship bundle in non-critically ill adults hospitalized with pneumonia ([Gohil 2024a](#)). Hospitals were randomly assigned to the routine or CPOE bundle groups. The CPOE bundle group received the same educational material for maintaining national antibiotic stewardship guidance as did the routine group and monthly coaching calls. They also received prompts during CPOE recommending standard-spectrum instead of extended-spectrum antibiotics during the first 3 hospital days (empiric period) for patients with a low absolute risk of MDRO pneumonia. They also received clinician education and feedback reports.

The primary outcome, empiric extended-spectrum days of therapy per 1000 empiric days. For the CPOE bundle group, extended-spectrum days of therapy decreased from 613.9 during the baseline period to 428.5 during the intervention period. For the routine group, extended-spectrum days of therapy decreased from 633.0 during the baseline period to 615.2. This represented a 28.4% significantly lower rate of empiric extended-spectrum days of therapy in the CPOE bundle group compared with routine stewardship. Secondary outcomes of vancomycin and antipseudomonal days of therapy showed similar reductions. Hospital length of stay and days to ICU transfer were unchanged.

The INSPIRE UTI Trial was a cluster-randomized trial comparing the effect of the INSPIRE stewardship CPOE bundle vs. routine antibiotic stewardship on empiric

extended-spectrum antibiotic selection in non-critically ill adults hospitalized with urinary tract infections ([Gohil 2024b](#)). As in the pneumonia trial, those in the INSPIRE CPOE stewardship group received CPOE prompts recommending standard-spectrum instead of extended-spectrum antibiotics for patients with a low absolute risk for MDRO UTI for orders placed during the first 3 days (empiric period). They also received clinician education and feedback reports.

For the primary outcome, the empiric extended-spectrum days of therapy per 1000 empiric days was 431.1 and 446.0 during the baseline and intervention periods, respectively, for the routine stewardship group. For the CPOE bundle group, extended-spectrum days of therapy decreased from 392.2 during the baseline period to 326.0 during the intervention period. That represented a 17.4% significantly lower rate of empiric extended-spectrum days of therapy in the CPOE bundle group compared with the routine stewardship group. Secondary outcomes of vancomycin and antipseudomonal days of therapy showed similar reductions. There was no significant change in hospital length of stay or days to ICU transfers.

Neither study reported cost outcomes, changes in *C. diff* incidence, or changes in hospital drug resistance patterns. They also did not mention clinician satisfaction with the program. Hopefully, extended followup may address some of those issues.

In summary, both INSPIRE trials demonstrated the CPOE prompts resulted in better empirical antibiotic selection without adverse impacts on safety parameters.

In the accompanying editorial ([Malani 2024](#)) it is pointed out that hospital-based stewardship efforts tend to emphasize de-escalation of antibiotics after microbiologic testing results return, and few focus on initial empiric prescribing as was done in the INSPIRE trials. The editorialists hope for replication of these results at other hospitals and with different EHR vendors and perhaps further improvement with data from centralized repositories containing information about multiple drug-resistant organisms.

#### **Some of our prior columns on antibiotic stewardship:**

- October 14, 2014      [“Antibiotic Stewardship”](#)
- November 2015      [“Medications Most Likely to Harm the Elderly Are...”](#)
- July 2016              [“NQF/CDC Guideline on Antibiotic Stewardship”](#)
- August 2016          [“Some Reassurance on Antibiotic Stewardship”](#)
- November 2016      [“C. Diff and Your Predecessor’s Room”](#)
- December 2016      [“Update on Ambulatory Antibiotic Stewardship”](#)
- July 2017              [“Antibiotics and Adverse Events”](#)
- July 2019              [“Dental Prescribing Called Into Question”](#)
- July 21, 2020         [“Is This Patient Allergic to Penicillin?”](#)
- March 30, 2021      [“Need for Better Antibiotic Stewardship”](#)
- August 2021          [“Antibiotic Stewardship in Pediatrics”](#)
- May 24, 2022         [“Requiring Indication for Antibiotic Prescribing”](#)

- August 2022      [“Resistant Infections Up During COVID-19 Pandemic”](#)

## References:

Gohil SK, Septimus E, Kleinman K, et al. Stewardship Prompts to Improve Antibiotic Selection for Pneumonia: The INSPIRE Randomized Clinical Trial. JAMA 2024; Published online April 19, 2024  
<https://jamanetwork.com/journals/jama/fullarticle/2817976>

Gohil SK, Septimus E, Kleinman K, et al. Stewardship Prompts to Improve Antibiotic Selection for Urinary Tract Infection: The INSPIRE Randomized Clinical Trial. JAMA 2024; Published online April 19, 2024  
<https://jamanetwork.com/journals/jama/fullarticle/2817975>

Malani AN, Malani PN. Harnessing the Electronic Health Record to Improve Empiric Antibiotic Prescribing. JAMA 2024; Published online April 19, 2024  
<https://jamanetwork.com/journals/jama/article-abstract/2817977>



<http://www.patientsafetysolutions.com/>

[Home](#)

[Tip of the Week Archive](#)

[What's New in the Patient Safety World Archive](#)