Best Practice Advisory Decreases Inpatient Urine Culture Orders

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Session: 50. Antimicrobial Stewardship: Interventions Leveraging the Electronic Health Record
Thursday, October 4, 2018: 12:30 PM

Background. Overprescribing of antibiotics for asymptomatic bacteriuria is common and studies reveal that antibiotic prescriptions often correlate with a positive urinalysis (UA) or urine culture (UCx), rather than signs or symptoms of a urinary tract infection. In attempts to decrease inappropriate UCx orders, the antimicrobial stewardship team developed a best practice advisory (BPA) within our electronic health record (EHR). The objective of this study was to evaluate the effects of the BPA on the number of UCx performed.

Methods. This intervention took place in an urban, level 1 trauma, public safety, teaching hospital. A BPA was developed within the EHR (Epic), which activated if a standalone UCx was ordered on a patient without a positive UA within the past 24 hours (defined as ≥10 WBC/HPF) (Figure 1). The BPA prompted providers to discontinue the UCx order and alternatively order a UA with reflex to culture (excluding pregnant women, immunocompromised, children <3 years old, urine collected by straight catheterization, or patients undergoing urologic procedures). In this retrospective pre-intervention–postintervention study, the preintervention period was May 2016 through October 2017, and the intervention period was December 2017 through March 2018. The BPA was activated in November 2017. The primary outcome was UCx performed/1,000 patient-days.

Results. During the 4-month intervention period, the BPA was activated 120 times. The UCx order was replaced by a UA with reflex to culture in 47% (56/120) of cases, while removal of the UCx alone was seen in 6% (7/120) of cases. The remainder of cases did not remove the original order with reasons including urine sample obtained by straight catheterization, urine culture added to prior urinalysis, a critically ill patient with encephalopathy (Figure 2). During the intervention period, there was a statistically significant decrease in both the number of standalone UCx performed from 41.2/1,000 patient-days to 30.1/1,000 patient-days (P = 0.008) and the total number of UCx performed 58.7/1,000 patient-days to 53.0/1,000 patient-days (P = 0.02) (Figure 3).

Conclusion. Implementation of a BPA to prevent the use of standalone UCx in favor of a UA with reflex culture reduced the total number of UCx performed.

Disclosures. All authors: No reported disclosures.
181. Evaluation of a Pilot Initiative for Tracking and Monitoring Indications Associated With Antibiotic Orders

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Background. The Christiana Care Antimicrobial Stewardship Program developed a pilot initiative for tracking and monitoring antibiotic utilization across the health system. This initiative aligns with the Joint Commission’s elements of performance, which calls for tracking and reporting of antibiotic prescribing, as well as the Centers for Medicaid and Medicare Services recommendations for documentation of antibiotic indication at time of order, and monitoring with each order. A retrospective indication list in the order entry field was created for cefepime, ceftriaxone, levofloxacin, and ciprofloxacin orders.

Methods. A retrospective chart review of antibiotic indications was completed. A maximum of 50 orders per each antibiotic from December 31, 2017 to January 6, 2018 were randomly selected to be evaluated. The primary endpoint of our study was the percent of cases in which the indication was selected according to the true indication per chart review. Secondary endpoints included the percent of cases in which other indication was selected where an available indication was appropriate, percent of cases in which the appropriate dose and frequency were prescribed, and percent of cases in which the duration of therapy was appropriate for urinary tract infections (UTIs).

Results. A total of 540 orders were profiled between December 31, 2017 and January 6, 2018, of which 182 were reviewed. In regards to the accuracy of selected indication, 94% of cefepime, 88% of ceftriaxone, 78% of ciprofloxacin, and 89% of levofloxacin orders were considered appropriate. Most common appropriate among ciprofloxacin orders (100%), followed by ceftriaxone (96%), cefepime (94%), and levofloxacin (74%). Frequency was most appropriate among ceftriaxone orders (98%), followed by ciprofloxacin (87%), levofloxacin (78%), and cefepime (74%). Duration of therapy was in appropriate in greater than 90% of UTI orders.

Conclusion. The pilot initiative for tracking and monitoring of antibiotic indications has allowed for enhanced transparency between providers regarding antimicrobial use. Further evaluation may provide greater understanding of antibiotic utilization and aid in identifying opportunities for improvement.

Disclosures. All authors: No reported disclosures.

182. Successes of a System-directed and Multi-faceted Inpatient Antimicrobial Stewardship Program in a Large, Integrated Delivery Organization

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Thursday, October 4, 2018: 12:30 PM

Background. In 2015, Baylor Scott and White Health (BSWH) implemented a system-wide antimicrobial stewardship program (ASP) across 22 acute care facilities. The ASP committee, led by an Infectious Diseases (ID) Physician and ID Pharmacist, includes membership of health system leadership, facility-specific ID physician and clinical pharmacy leaders, informatics, infection control, and microbiology. The committee’s purpose was to facilitate local implementation of antimicrobial stewardship interventions recommended by the Centers for Disease Control and Prevention and to aid in identifying opportunities for improvement.

Methods. The ASP created and approved antibiotic use guidelines (carbapenems, vancomycin, daptomycin, fluoroquinolones), policies, and set performance goals related to antibiotic use, which were then implemented locally at each facility. Beginning July 2016, all 22 acute care facilities were live with a clinical decision support (CDS) tool, a mobile device platform for physician access to ASP guidelines, and a requirement for antibiotic review at 48–72 hours. The CDS software also provided tracking of utilization data as days of therapy (DOT) standardized to 1,000 patient-days at risk (DAR) at the local facility and health system levels. The ASP committee tracked and reported metrics on the usage of total and targeted antibacterials, with comparisons in usage made as days of therapy (DOT) standardized to 1,000 patient-days at risk (DAR) at the Charlotte NC area. Providers were alerted when a patient was discharged from the ED on an FQ with a target diagnosis (infections identified as being inappropriate for FQ) without additional exclusions (e.g., penicillin allergy) (Figure 1). Initial provider education on appropriate FQ use accompanied EHR alert implementation at all 19 participating EDs in November 2016. Targeted follow-up education was delivered in August 2017. We compared overall FQ prescribing rates in pre- vs. post-alert intervals using chi-squared tests. We compared FQ prescription volume following alert failure by indication for high alert failure diagnoses (ICD10 codes with 275 alerts) in Q1 2017 vs. Q4 2017.

Results. Target population ED discharges remained stable pre- and post-alert implementation (37,975 vs. 37,731). FQ prescribing decreased 53% from pre (n = 13,796, 36%) to post alert (n = 7,289, 19%; P < 0.001). While total orders avoided after alert firing remained low, the total prescriptions (i.e., alert overrides) dropped from 789 in January 2017 to 397 in December 2017 (Figure 2). The largest decrease was observed after repeat provider education in August 2017. Diagnosis categories with high volume alert failures decreased from 15 unique ICD10 diagnosis (n = 1,534 prescriptions) in Q1 2017 to 3 (diverticulitis, pneumonia, gastroenteritis/colic; n = 419 prescriptions) in Q4 2017.

Conclusion. Effective EHR alert implementation combined with timely and targeted provider education on appropriate prescribing reduces inappropriate EHR provider FQ prescribing by more than 50%.

Figure 1: Example of Emergency Department Fluoroquinolone Alert

Disclosures. L. Davidson, Duke Endowment: Grant Investigator, Grant recipient