

**Disclosures.** All authors: No reported disclosures.

### 1149. Reducing Piperacillin/Tazobactam Use in Children with Acute Perforated Appendicitis

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**Session:** 139. Antibiotic Stewardship (Pediatric): Implementation in Hospitals  
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**Background.** Children with perforated appendicitis have more frequent complications compared with nonperforated appendicitis. Existing data suggest broad-spectrum antibiotics are not superior to narrow-spectrum antibiotics for this condition. In an effort to safely decrease broad-spectrum antibiotic use at our hospital, we evaluated the impact of an antimicrobial stewardship program (ASP) intervention on the use of piperacillin/tazobactam (PT) and clinical outcomes in children with perforated appendicitis.

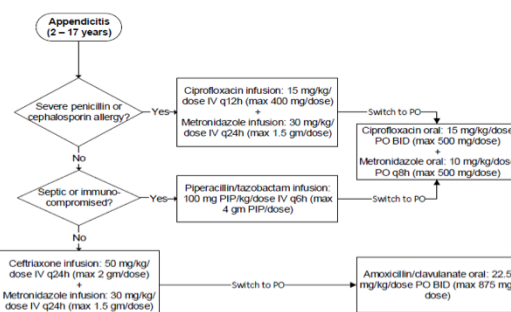
**Methods.** Single-center, retrospective cohort study of children  $\leq 18$  years with perforated appendicitis who underwent primary appendectomy. Children with primary nonoperative management or interval appendectomy were excluded. Prior to the intervention, children at our hospital routinely received PT for perforated appendicitis. An electronic health record (EHR)-integrated guideline that recommended ceftriaxone and metronidazole for perforated appendicitis was released on July 1, 2017 (Figure 1). We compared PT utilization, measured in days of therapy (DOT) per 1,000 patient-days, and clinical outcomes before and after the intervention.

**Results.** A total of 74 children with perforated appendicitis were identified: 23 during the pre-intervention period (June 1, 2016 to June 30, 2017) and 51 post-intervention (July 1, 2017 to September 30, 2018). Thirty-three patients (45%) were female and the median age was 8 years (IQR: 5–11.75 years). Post-intervention rate of guideline compliance was 84%. PT use decreased from 556 DOT per 1000 patient-days to 131 DOT per 1000 patient-days; incidence rate ratio of 0.24 (95% CI: 0.16–0.35), post-intervention vs. pre-intervention. There was no statistically significant difference in duration of intravenous antibiotics, total antibiotic duration, postoperative length of stay (LOS), total LOS, ED visits/readmission, or surgical site infection (SSI) between pre- and post-intervention periods (Table 1).

**Conclusion.** An EHR-integrated ASP intervention targeting children with perforated appendicitis resulted in decreased broad-spectrum antibiotic use with no

statistically significant difference in clinical outcomes. Larger, multicenter trials are needed to confirm our findings.

**Figure 1. Algorithm for antibiotic selection for acute appendicitis**



**Table 1. Comparison of characteristics and outcomes, before and after the antimicrobial stewardship intervention**

Characteristics:	Pre-intervention, N=23	Post-intervention, N=51
Sex (female)	10 (43%)	23 (45%)
Ethnicity (Hispanic)	15 (65%)	24 (47%)
Race		
White	10 (43%)	21 (41%)
Asian	2 (9%)	7 (14%)
Black	0	1 (2%)
Other	11 (48%)	22 (43%)
Age (mean, 95% CI)	8.5 (6.7 – 10.3)	8.3 (7.1 – 9.5)
Immunocompromised	3 (13%)	1 (2%)
Intraoperative findings:		
Diffuse purulence	7 (30%)	15 (29%)
Abscess	9 (39%)	15 (29%)
Extraluminal fecalith	1 (4%)	5 (10%)
Outcomes:	Pre-intervention, N=23	Post-intervention, N=51
<b>Piperacillin/tazobactam days/1000 patient days*</b>	<b>556</b>	<b>131</b>
Length of intravenous antibiotics (mean, 95% CI) in days	5.8 (4.6 – 7.1)	5 (4.2 – 5.9)
Total length of antibiotic therapy (mean, 95% CI) in days	10.7 (9.2 – 12.1)	9.5 (8.4 – 10.6)
LOS after surgery (mean, 95% CI), in days	6.4 (5.2 – 7.6)	6 (4.9 – 7)
Total LOS (mean, 95% CI), in days	6.6 (5.4 – 7.7)	6.4 (5.2 – 7.6)
ED visits/readmissions	2 (9%)	7 (14%)
ED visits	1 (4%)	1 (2%)
Readmission	1 (4%)	6 (12%)
Surgical Site Infection	1 (4%)	6 (12%)

ED; emergency department, LOS; length of stay  
\* p < 0.05

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### 1150. Evaluating the Impact of Antibiotic Prophylaxis on the Microbiology and Incidence of Ventriculitis in Patients with External Ventricular Drains

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**Session:** 140. HAI, Device-Associated: Other Devices  
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**Background.** External ventricular drains (EVDs) are frequently used in acute brain injuries for continuous intracranial pressure monitoring and cerebrospinal (CSF) fluid diversion. EVDs are associated with a 0–22% risk of ventriculitis. The evidence for antibiotic prophylaxis (AP) for ventriculitis prevention is not robust. This study aimed to delineate the incidence of EVD-related ventriculitis and causative organisms in patients receiving AP.

**Methods.** A retrospective chart review from 2013 to 2018 at Yale New Haven Hospital was performed. Patients were included if  $\geq 18$  years of age, admitted to the neurosciences intensive care unit (ICU), and had AP with cefazolin, vancomycin, sulfamethoxazole/trimethoprim, or clindamycin. Patients were excluded if they had a diagnosis of meningitis or ventriculitis prior to EVD placement, on multiple agents for AP, on antibiotics for indications other than AP, CSF leak, or skull fracture. The primary endpoint was the incidence of ventriculitis per 1,000 EVD-days. Secondary endpoints were causative organisms of ventriculitis, EVD duration, ICU length of stay (LOS), hospital LOS, and 30-day mortality.

**Results.** Five hundred ninety-nine patients were reviewed and 249 patients were included. Baseline demographics are noted in Table 1. Cefazolin was the most common agent for AP (98%). There were 7 cases of ventriculitis with an incidence rate of 2.8% (4 infections per 1000 EVD-days). All of the causative organisms were resistant to the

prophylactic agents administered (Table 2). Patients with ventriculitis had a significantly longer duration of EVD placement ( $10 \pm 3$  vs.  $7 \pm 6$  days,  $P = 0.03$ ), hospital LOS ( $30 \pm 19$  days vs.  $15 \pm 12$ ,  $P = 0.04$ ), ICU LOS ( $22 \pm 14$  vs.  $10 \pm 7$ ,  $P = 0.03$ ). Two patients with ventriculitis (28%) died within 30 days of admission compared with 46 patients without ventriculitis (19%,  $P = 0.53$ ) (Table 3).

**Conclusion.** The rate of ventriculitis in our study was similar to previous studies that did not utilize AP. All of the causative organisms were resistant to the prophylactic agent. Patients who had ventriculitis had a longer duration of EVD placement, hospital LOS, and ICU LOS; however, 30-day mortality was not impacted. Based on our findings, the use of AP to prevent EVD-related ventriculitis should be reconsidered.

Table 1. Demographics

Demographic Category	Study Group (n = 249)
Age, mean (years)	58 ± 16
Male (%)	109 (44)
EVD Duration, median (days)	6 ± 6
Duration of Prophylaxis, median (days)	6 ± 7
Reason for EVD	
• Subarachnoid Hemorrhage (%)	189 (76)
• Tumor (%)	48 (19)
• Acute Ischemic Stroke (%)	5 (2)
• Other (%)	7 (3)
Prophylactic Agent	
• Cefazolin (%)	245 (98)
• Vancomycin (%)	3 (1)
• Clindamycin (%)	1 (1)
Overall EVD-Days	1729
Ventriculitis Cases (%)	7 (2.8)
Ventriculitis per 1000 EVD-days	4
Length of Stay, median (days)	13 ± 12.5
ICU Length of Stay, median (days)	6 ± 8
30-Day Mortality (%)	48 (19.3)

Table 2. Ventriculitis Causative Organisms

Organism Cultured	Duration of EVD Prior to Positive Culture (days)	Susceptible to Prophylactic Agent (yes/no)
<i>Acinetobacter baumannii</i>	6	No
Coagulase-negative Staphylococcus	26	No
<i>Enterobacter cloacae</i>	12	No
<i>Enterobacter cloacae</i>	12	No
<i>Gordonia sputi</i>	10	No
<i>Klebsiella pneumoniae</i>	6	No
<i>Pseudomonas aeruginosa</i>	13	No

Table 3. Secondary Outcomes

	Ventriculitis (n=7)	No Ventriculitis (n=242)	P-value
Hospital LOS, mean (days)	30.1 ± 18.9	15.2 ± 12.2	0.04
ICU LOS, mean (days)	22.3 ± 13.8	10.0 ± 7.3	0.03
Duration of EVD, mean (days)	9.8 ± 3.1	6.8 ± 5.6	0.03
30-Day Mortality (%)	2 (28.5)	46 (19)	0.53

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### 1151. A Comparison of Periurethral Cleaning Between Normal Saline and Savlon Solutions Before Indwelling Urinary Catheterization in Reducing Catheter-Associated Bacteriuria: A Randomized Controlled Study

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**Session:** 141. HAI, Device-Associated: CAUTI  
Friday, October 4, 2019: 12:15 PM

**Background.** Catheter-associated urinary tract infection (CAUTI) is one of the most common nosocomial infections. To date, there have been no randomized controlled studies to recommend the most appropriate antiseptic solution for periurethral cleaning before indwelling urinary catheterization. This study was aimed to compare normal saline solution (NSS) and Savlon solution for periurethral cleaning before indwelling urinary catheterization in reducing catheter-associated bacteriuria.

**Methods.** A randomized controlled, noninferiority, cross-over study to determine the incidence of significant bacteriuria (SB) on day 5 after Foley catheterization, was carried out in all adult patients admitted in the 2 medical intensive care units (ICUs), 1 surgical ICU, 2 neurosurgical ICUs, 4 medical wards, 4 surgical wards and 1 emergency room (ER) of King Chulalongkorn Memorial Hospital, Thailand, from June 2018 to March 2019. The acceptable prespecified noninferiority margin was set to be 10%. Each solution was used alternately every 3 months in each unit. Urine culture was collected on day 1, 3, and 5 of Foley catheter.

**Results.** During the study period, there were 207 and 160 patients in the NSS and Savlon groups, respectively. 202 (55%) patients had received Foley catheterization in the emergency room. There were no significant differences in the indication, the current illness, and preexisting condition between the 2 groups. The overall incidence

of SB on day 3 and 5 after catheterization was 4% and 8.2%. The incidence of CAUTI was 3.43/1,000 catheter-day. The median duration of catheterization was 5 (IQR 3, 7) days. On day 5 after catheterization, noninferiority was demonstrated for the incidence of SB with an adjusted difference of 4 (95% CI of the difference: -2.1% to 8.9%,  $P = 0.05$ ). Regarding the incidence of CAUTI, there was no significant difference between the 2 groups.

**Conclusion.** To the best of our knowledge, our study was the first randomized controlled study to compare the 2 solutions for periurethral cleaning before indwelling urinary catheterization in different departments. This study demonstrates the noninferiority of NSS to Savlon solution in reducing the incidence of SB.

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### 1152. Implementation of Enhanced Data Surveillance Methods to Reduce Catheter-Associated Urinary Tract Infections

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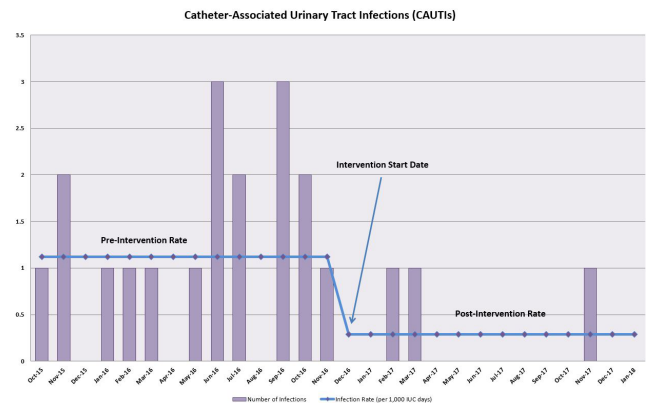
**Session:** 141. HAI, Device-Associated: CAUTI  
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**Background.** Urinary tract infections (UTIs) continue to be one of the most common types of healthcare-associated infections (HAIs). Instrumentation of the urinary tract using devices such as indwelling urinary catheters (IUCs) is the leading cause of healthcare-associated UTIs. Every day that a patient has an IUC increases their risk of acquiring a UTI. After an increase in the number of catheter-associated urinary tract infections (CAUTIs), a mid-sized acute care hospital in the Northeast United States used an electronic surveillance system to monitor IUC order compliance and appropriateness in order to reduce IUC utilization and prevent CAUTIs.

**Methods.** Using an Infection Prevention (IP) electronic surveillance system, a line list was generated of patients who had an IUC documented in the urinary flow sheet of their electronic medical record. This list contained variables such as: catheter insert date, catheter order status, and catheter indication. IP staff sent this list in a daily e-mail to clinical leadership and front line staff over a 14 month period. The e-mail notified providers when their patients had an IUC without an order. Clinical staff was directed to discontinue the IUC if it was no longer indicated or to place a new IUC order if still indicated. The National Healthcare Safety Network (NHSN) CAUTI definition and data functions were used for the purposes of this study.

**Results.** A statistically significant ( $P = 0.017$ ) reduction in the hospital CAUTI rate was found when a comparison was made between the 14-month pre-intervention baseline period (1.12 CAUTI per 1,000 catheter days) and the 14 month post-intervention period (0.29 CAUTI per 1,000 catheter days). A statistically significant decrease ( $P = 0.0004$ ) in IUC utilization was also noted for the same time period, decreasing from 8.2 catheters per 100 patient-days to 7.8 catheters per 100 patient-days.

**Conclusion.** A significant reduction in CAUTIs and IUC utilization was seen over the 14-month IP-driven e-mail intervention. This study suggests that regular electronic communication of surveillance system information to providers may reduce CAUTIs.



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### 1153. National Trend of Urinary Catheter Device Utilization by Hospital Type, National Healthcare Safety Network (2015–2019)

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**Session:** 141. HAI, Device-Associated: CAUTI  
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**Background.** Reducing unnecessary urinary catheter use and optimizing insertion techniques and catheter maintenance and care practices are the most important urinary tract infection (CAUTI) prevention strategies. To monitor device use (DU) as quality improvement activity, the Centers for Disease Control and Prevention's