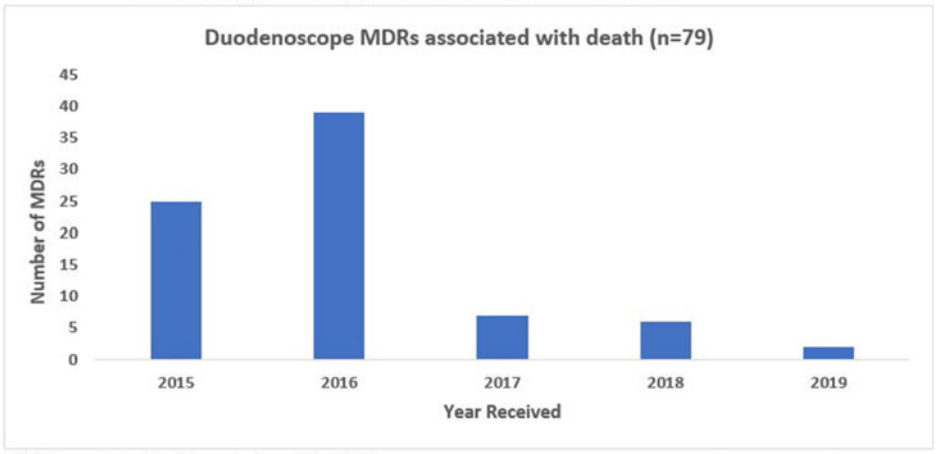
Figure 2. Number of duodenoscope MDR reports[1,2] of death associated with patient infection, patient exposure or device contamination



1. 2019 year only includes data received as of July 1, 2019
2. Cause of death is undetermined or related to patient's preexisting condition in some cases

Fig. 2.

number of reported infections decreased from 247 MDRs in 2015 to 55 MDRs in the first half of 2019. Furthermore, the number of reported deaths decreased from 25 MDRs in 2015 to 2 MDRs reported in the first half of 2019. **Conclusions:** The MDR data indicate a decrease in the number of reported infections. The decrease in infections suggests that efforts to reduce the risk of infection from duodenoscopes have yielded improvements; however, additional improvements are necessary to further decrease the risk of infection.

Funding: None
Disclosures: None
Doi:10.1017/ice.2020.737

Presentation Type:
Poster Presentation

Duodenoscope-Associated Outbreak of a Carbapenem Resistant Enterobacteriaceae

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Background: We describe and evaluate our outbreak of carbapenem-resistant *K. pneumoniae* transmitted by contaminated duodenoscopes during endoscopic retrograde cholangiopancreatography (ERCP) procedures. **Methods:** An outbreak investigation was performed when *Klebsiella pneumoniae* carbapenemase-producing *K. pneumoniae* (KPC-KP) were identified from bile specimens of 4 patients. The investigation included medical record review, practice audits, and surveillance cultures of duodenoscopes and environmental sites. If available, clinical specimens were obtained from patients who had undergone ERCP in the previous 3 months. Carbapenem-resistant Enterobacteriaceae (CRE) screening cultures were performed to identify additional patients until no CRE cases were detected during 2 consecutive weeks. Pulsed-field gel electrophoresis (PFGE) of KPC-KP isolates was implemented. **Results:** In total, 12 cases were identified with exposure to duodenoscope from February 2019 through April 2019, including 6 cases with infections and 6 asymptomatic carriers. Case-control analysis showed that 2 specific duodenoscopes would be associated with the KPC-KP outbreak. Duodenoscope reprocessing procedures did not deviate from manufacturer recommendations for reprocessing. After ethylene oxide (EO) gas sterilization, the outbreak was terminated. **Conclusions:** Meticulous cleaning protocol and enhanced surveillance are necessary to prevent outbreaks of CRE. Notably, enhanced cleaning measures, such as sterilization for duodenoscopes, would be required after procedures with KPC-KP carriers.

Funding: None
Disclosures: None
Doi:10.1017/ice.2020.738

Presentation Type:
Poster Presentation

Duration of Outpatient Antibiotic Therapy in Common Outpatient Infections, 2017

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Background: Community-acquired pneumonia (CAP), urinary tract infection (UTI), pharyngitis, acute otitis media (AOM), and skin and soft-tissue infection (SSTI) are among the most common outpatient conditions for which antibiotics are prescribed. The objective of this study was to describe the observed duration of outpatient antibiotic therapy compared with guideline recommendations for these common conditions in 2017 in the United States to identify antibiotic stewardship targets. **Methods:** We estimated therapy duration for oral and parenteral antibiotic prescriptions associated with CAP, AOM, pharyngitis, acute cystitis, pyelonephritis, SSTI, and sinusitis diagnoses from the IQVIA National Disease and Therapeutic Index 2017 dataset, a two-stage stratified cluster sample of office-based physician visits. We excluded azithromycin due to its unique pharmacokinetics, and we limited our study to prescriptions from emergency medicine, family practice, general practice, geriatrics, internal medicine, osteopathic medicine, and

Table 1. Estimated non-azithromycin antibiotic prescriptions, IQVIA National Disease and Therapeutic Index (NDTI), 2017

Condition	Population	Guideline-recommended duration, days	Estimated no. antibiotic courses (95% Confidence Interval)	Median (Inter-quartile range)
Pharyngitis	Adult	10	2,116,517 (1,762,606-2,470,428)	10 (10-10)
	Pediatric	10	4,784,126 (4,272,393-5,295,859)	10 (10-10)
Sinusitis	Adult	5-7	5,739,038 (5,065,041-6,413,035)	10 (10-10)
	Pediatric	10-14	1,488,571 (1,190,070-1,787,072)	10 (10-10)
Acute otitis media	<2 years	10	1,840,967 (1,542,028-2,139,906)	10 (10-10)
	2-18 years	10, but shorter likely adequate	4,434,842 (3,963,880-4,905,804)	10 (10-10)
Community-acquired pneumonia	Adult	5[A]	563,790 (394,691-732,889)	10 (7-10)
	Pediatric	No recommendation	323,798 (204,637-442,959)	10 (10-10)
Acute cystitis	Reproductive-aged females (12-64 years)	3-5[B]	3,341,905 (2,879,353-3,804,457)	7 (5-7)
Pyelonephritis	Reproductive-aged females (12-64 years)	5-14[B]	38,618 (0-83,361)	10 (7-10)
Skin and Soft Tissue Infections	Adult	5[A]	2,537,196 (2,159,435-2,914,957)	10 (7-10)
	Pediatric	5[A]	898,601 (708,032-1,089,170)	10 (10-10)

[A] Minimum, with possible extension.
[B] First-line; varies by agent.

pediatrics physicians. We excluded observations with antibiotic prescriptions for multiple conditions. We used NDTI projection weights and complex sample methods to estimate antibiotic prescription numbers and durations by condition and age group. **Results:** Table 1 shows antibiotic prescriptions by condition and population. The median antibiotic therapy duration for all conditions except acute cystitis was 10 days. The median duration for acute cystitis was 7 days. **Conclusions:** Clinicians prescribed 10-day antibiotic courses for the most common outpatient conditions, regardless of guideline-recommended duration. Antibiotic stewardship efforts targeting excessive durations of antibiotic therapy for common outpatient conditions, particularly sinusitis in adults, CAP, SSTI, and acute cystitis, are needed.

Funding: This work was supported by the Centers for Disease Control and Prevention. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Disclosures: Laura M. King is a contractor employed by Northrop Grumman Corporation to fulfill research needs at the Centers for Disease Control and Prevention as part of a contract covering many positions and tasks. All other authors declare no conflicts.

Doi:10.1017/ice.2020.739

Presentation Type:
Poster Presentation

Educational Intervention Improves Clinician Infection Prevention Knowledge and Behavior in a Pediatric Emergency Department

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Background: Children with contagious illness are frequently cared for in the pediatric emergency department. Incomplete infection prevention knowledge and incorrect practices create opportunities for transmission of pathogens. We implemented an educational intervention to improve clinician infection prevention knowledge and behavior. **Methods:** Clinicians providing care in an academic tertiary-care affiliated, pediatric ED were invited to participate in a 3-month educational intervention focusing on basic infection prevention principles such as hand hygiene and symptom-based isolation. Qstream, an educational platform that employs spaced-learning and game theory, was used to develop and electronically distribute 7 scenario-based questions. Questions were distributed 1 question per day 3 times per week. Questions were repeated until they were answered correctly twice. Round 1 of questions began in March 2019. After a ~4-week hiatus, the process was repeated in May 2019 (round 2). The Kirkpatrick model was used to measure the effectiveness of the educational intervention. Outcomes included clinician assessment of acceptability of the intervention, change in correct responses to knowledge-based questions over time, hand hygiene performance of clinicians and the number of infectious exposures in the emergency department. **Results:** Overall, 61 (73%) clinicians participated, of whom >90% liked the format, found it easy to use, and thought it required an appropriate amount of time. During round 1, average proficiency increased from 36% to 64%. During round 2, average proficiency increased from 62% to 78%. Starting in May 2019, physician hand hygiene gradually increased from a baseline of 78% to 100%. In the 10 months before and after March 2019, there were 2 exposure events involving 10 healthcare personnel versus 3 exposure events involving 4 healthcare personnel. **Conclusions:** Novel education strategies that utilize adult learning principles are user-friendly effective strategies that improve infection prevention knowledge and practice.

Funding: None

Disclosures: None

Doi:10.1017/ice.2020.740