Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: Antibiotic Stewardship
Length of antibiotic therapy among adults aged ≥65 years hospitalized with uncomplicated community-acquired pneumonia, 2013-2020
Natalie McCarthy; Hannah Wolford; Sophia Kazakova; James Baggs; Brandon Attell; Sarah Kabbani; Melinda Neuhauser; Sarah Yi; Kelly Hatfield; Sujan Reddy and Lauri Hicks

Background: The 2014 US National Strategy for Combating Antibiotic-Resistant Bacteria aimed to reduce inappropriate inpatient antibiotic use by 20% for monitored conditions, such as community-acquired pneumonia (CAP), by 2020. Clinical guidelines recommend treating uncomplicated CAP with a minimum of 5 days of antibiotic therapy. Total length of therapy (LOT) >7 days or >3 days after clinical improvement is rarely necessary. In a previous study estimating LOT in uncomplicated CAP patients, 71% of patients ≥65 years exceeded recommended duration of antibiotics in 2012–2013 (Yi et al, 2018). We evaluated annual trends in LOT in adults ≥65 years hospitalized with uncomplicated CAP from 2013 to 2020. **Methods:** We conducted a retrospective cohort study among patients in the CMS database with a primary diagnosis of bacterial or unspecified pneumonia using *International Classification of Diseases 9th* and *10th Revision* codes, length of stay (LOS) of 2–10 days, discharged home with self-care, and not rehospitalized in the 3 days following discharge. Discharge home was used as a surrogate for clinical improvement. Because inpatient LOT is not available in CMS data, we used linear regression to model inpatient LOT as a function of LOS using data on CAP patients ≥65 years from the PINC AI healthcare database. Postdischarge LOT was based on prescriptions filled following discharge. Total LOT was calculated by summing estimated inpatient LOT and actual post-discharge LOT (Fig. 1). Total LOT >7 days and postdischarge LOT >3 days were considered indicators of likely excessive LOT. We reported trends in the proportion of patients with likely excessive LOT during the study period. **Results:** From 2013 through 2020, there were 400,928 uncomplicated CAP hospitalizations among patients aged ≥65 years. Patients were more likely to be female (55%), and they had a median age of 76 years and a median LOS of 3 days. The median total LOT decreased from 9.5 days in 2013 to 7.7 days in 2020. The proportion of patients with total LOT >7 days decreased from 68% in 2013 to 50% in 2020 (% change, −27%); the proportion with postdischarge LOT >3 days decreased from 73% in 2013 to 62% in 2020 (% change, −16%) (Fig. 2). **Conclusions:** Likely excessive total LOT for adults ≥65 years hospitalized with uncomplicated CAP decreased by 27% in 2020, a considerable improvement from 2013. However, the high proportion of patients with likely excessive postdischarge LOT in 2020 (62%) demonstrates the need for antibiotic stewardship to optimize prescribing at hospital discharge.
Disclosures: None

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Empiric antibiotic selection for community-acquired pneumonia in US hospitals, 2013–2020
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Background: Community-acquired pneumonia (CAP) is a common indication for antibiotic prescribing in hospitalized patients. Professional societies' clinical guidelines recommend specific antibiotics for empiric treatment of CAP based on clinical factors. Manual assessments of appropriateness are time-consuming and are often conducted on a smaller scale. We evaluated empiric antibiotic selection among a large cohort of adults hospitalized with CAP using electronic health records. **Methods:** In this study, we used the PINC-AI healthcare database to define a cohort of adults hospitalized with CAP from 2013 to 2020. CAP was identified by *International Classification of Diseases* (ICD) diagnosis codes. Exclusions were applied to identify uncomplicated CAP (Fig. 1). Treatment was only evaluated if a chest radiograph or computerized

Figure 1: Calculation of Total Length of Antibiotic Therapy (LOT) Among Adults ≥ 65 years Hospitalized with Uncomplicated Community-Acquired Pneumonia

Figure 2. Proportion of patients >=65 years hospitalized with uncomplicated community-acquired pneumonia, with likely excessive length of therapy (LOT), 2013-2020
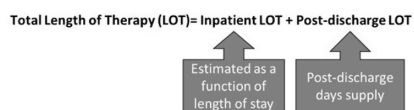

Figure 1. Flowchart of eligibility for adult hospital discharges with community-acquired pneumonia (CAP) selected for the study population, 2013-2020.
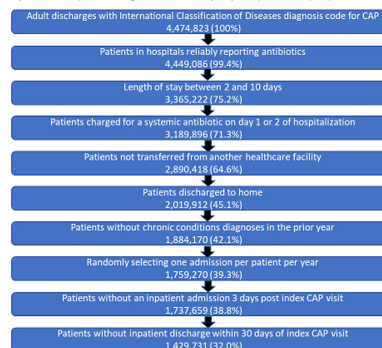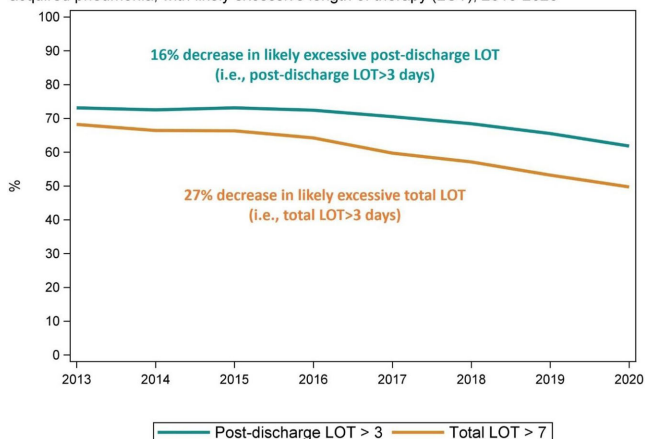

Figure 2. Annual eligible discharges of patients with uncomplicated community-acquired pneumonia (CAP) receiving non-recommended treatment without MRSA colonization or antibiotic allergies, non-recommended treatment with MRSA colonization, non-recommended treatment with antibiotic allergies, guideline-recommended treatment and an inadequate CAP evaluation, 2013-2020.
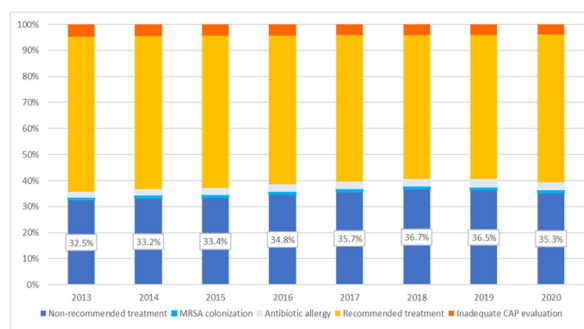
Figure 3. A) The proportion of discharges charged for the most commonly prescribed antibiotics among community-acquired pneumonia (CAP) patients with guideline-recommended treatment. B) The proportion of discharges receiving the most commonly prescribed antibiotics among community-acquired (CAP) pneumonia patients with non-recommended treatment without an antibiotic allergy or MRSA colonization.
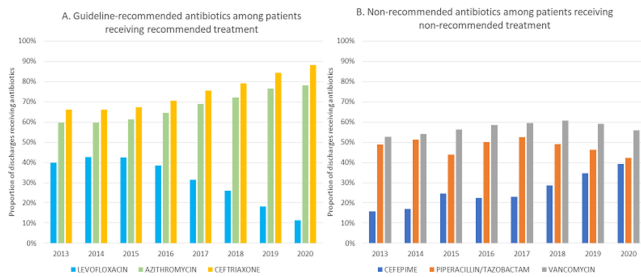
tomography (CT) scan was charged during the first 2 days of hospitalization, otherwise it was considered an inadequate CAP evaluation. Administrative billing data were used to identify antibiotics charged within the first 2 days of hospitalization. Empiric guideline-recommended treatment was determined based on 2019 CAP guidelines and more recent studies. Patients who received nonrecommended treatment were evaluated for antibiotic allergies in the current hospitalization or methicillin-resistant *Staphylococcus aureus* (MRSA) colonization or infection in the year prior or on admission using *International Classification of Disease, Tenth Revision* (ICD-10) diagnosis codes. **Results:** We identified 4.47 million adult hospitalizations with CAP from 2013 to 2020; 32% (1.43 million) were included in this analysis (Fig. 1). Among discharges with adequate CAP evaluation (1.37 million), 59.7% received recommended antibiotics in the first 2 days of hospitalization, ranging from 62.6% in 2013 to 57.5% in 2019. Overall, 34.8% of our study population received a nonrecommended antibiotic without documentation of an antibiotic allergy or MRSA colonization (2013: 32.5%; 2018: 36.7%) (Fig. 2). Most patients in our study population received >1 antibiotic (92.3%) in the first 2 days of hospitalization. The most common antibiotics among patients receiving recommended treatment were ceftriaxone (74.2% of patients receiving recommended treatment), azithromycin (67.2%), and levofloxacin (31.8%) (Fig. 3a). The most common nonrecommended antibiotics were vancomycin (57.2% of patients receiving nonrecommended treatment), piperacillin-tazobactam (48.1%), and cefepime (25.7%) (Fig. 3b). From 2013 to 2020, cefepime charges consistently increased among CAP patients treated with nonrecommended antibiotics, whereas levofloxacin charges consistently decreased among CAP patients treated with only recommended antibiotics. **Conclusions:** Approximately one-third of patients with uncomplicated CAP received nonrecommended empiric antibiotics, and from 2013 to 2020 that proportion increased by 9%. Additional strategies are needed to help identify opportunities to optimize antibiotic selection among patients with CAP.

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Implementing a health-system–wide antibiotic stewardship program in ambulatory surgery centers

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Background: In 2016, the CDC released the Core Elements of Outpatient Antibiotic Stewardship, which extended the requirements previously released for hospital facilities and nursing homes to the outpatient setting. Several regulatory agencies focused on outpatient antimicrobial use. However, The Joint Commission and the Ambulatory Surgery Center (ASC) Leapfrog Group excluded ambulatory surgery centers from their medication management standards and questions. Due to the public health and patient safety benefits of implementing an antimicrobial stewardship program (ASP) and increasing regulatory interest in the matter, the Hospital Corporation of America (HCA) Ambulatory Surgery Division formally launched a nationwide ASP for its ambulatory surgery centers in March 2021. **Methods:** HCA is a large healthcare system with 146 ASCs in 16 states in 2021. The structure of the ASCs are local surgery centers with a medical director, a nurse responsible for infection prevention, and a pharmacist at a regional level. The types of surgeries vary based on location and ASC site. In 2019, a multidisciplinary team formed the corporate planning committee. The program was modeled after the CDC Core Elements and The Joint Commission's requirements for an ASP. Each ASC was asked to build a local ASP team, led by a local physician and a regionally based pharmacist. In addition, a stewardship goal was established to update all preoperative antibiotic surgical-site infection prophylaxis order sets. The corporate committee provided educational resources, including evidence-based guidelines for appropriate antibiotic selection for surgical-site infections. They collected antibiotic cost per case as a baseline metric to track and analyze. Pediatric, ophthalmic, and gastrointestinal endoscopic procedures were excluded from the program. **Results:** From January 1, 2020, through December 31, 2021, including only centers that were operational during this period and excluding single specialty endoscopy centers, antibiotic cost per case decreased annually from $2.38 to $1.84 ($t = 4.157$; $P < .005$), and the postoperative infection rate also declined from 0.370 to 0.304 ($t = 2.079$; $P = .040$). **Conclusions:** Our findings suggest that implementing a health-system–wide outpatient antibiotic stewardship program in the ambulatory surgery center setting is feasible and may contribute to decreased antibiotic cost per case and improved postoperative surgical site infection rates.

Disclosures: None

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Prevalence of and risk factors for bacteremic UTIs in hospitalized adults without definitive signs or symptoms of UTI

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Background: IDSA guidelines recommend withholding treatment in patients with asymptomatic bacteriuria in the absence of systemic signs of infection. However, some patients with bacteriuria may not be able to express symptoms either due to presence of indwelling catheter, underlying complicated urologic anatomy, dementia, or altered mental status (AMS). Clinicians frequently treat bacteriuria in this population with antimicrobial therapy due to concern for sepsis. To determine treatment need, we aimed to review prevalence and risk factors for bacteremic urinary tract infection (UTI) in a cohort of hospitalized inpatients without definitive signs and symptoms of a UTI. **Methods:** This retrospective cohort study of inpatients with a positive urine culture who presented without definitive signs or symptoms of a UTI was conducted between July 1, 2017, and June 30, 2022, in 68 academic and community hospitals (Michigan Hospital Medicine Safety Consortium). Signs and symptoms were obtained from medical record review 3 days before and after urine-culture collection. Bacteremic UTI was defined as any positive blood culture growing at least 1 organism matching the urine culture. Risk factors for bacteremic UTI were assessed using multivariable logistic regression models with results expressed as odds ratios (ORs) for dichotomous variables and relative risks (RRs) for continuous variables. **Results:** Of 11,793 patients meeting study criteria, 73.6% were female with a median age of 78.2 years. Overall, 41.8% had AMS, 33.8% had dementia, 15.6% had an indwelling urinary catheter, and 54.6% had complicated urologic history (eg, urologic surgery). Of these, 166 patients (1.4%) developed bacteremic UTI. On adjusted analysis, male sex, hypotension, heart rate >90, urinary retention, fatigue, log of serum leukocytosis [1 log increase in serum WBC = 2.718 × serum white blood cell count (WBC)], and pyuria with >25 WBC per high-powered