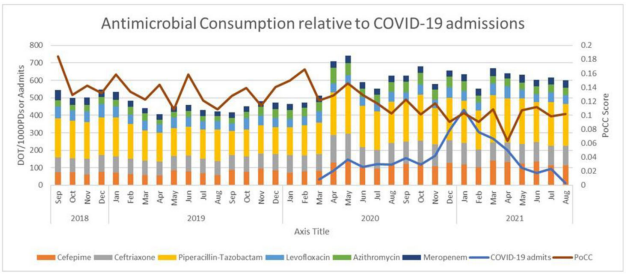

Fig. 1. Antimicrobial consumption relative to COVID-19 admissions from September 2018 to August 2021. The left y-axis represents days of therapy per 1,000 patient days (DOT per 1,000 PD) for antibiotics and total COVID-19 admissions for the respective variables. *PoCC = [(meropenem DOT per 1,000 PD)/(meropenem DOT per 1,000 PD + cefepime DOT per 1,000 PD + piperacillin-tazobactam DOT per 1,000 PD)]

for multiple comparisons was utilized to determine significance with an initial baseline α of 0.05. All data analyses were performed using R software (R Foundation for Statistical Computing, Vienna, Austria, 2021). **Results:** Normality was evaluated with QQ-plots and all data demonstrated normality. Bonferroni correction produced an adjusted α value of 0.007. We detected significant increases in the use of cefepime, piperacillin-tazobactam, ceftriaxone, and azithromycin following the onset of the COVID-19 pandemic. We noted a significant decrease in the PoCC metric during this period. No significant change was noted for levofloxacin or meropenem. **Conclusions:** The COVID-19 pandemic produced significant changes in antimicrobial use patterns at our institution. We noted statistically significant increases in bacterial community-acquired pneumonia-focused antibiotics (ceftriaxone and azithromycin). We observed significant increases for cefepime and piperacillin-tazobactam. Interestingly, relative utilization of carbapenems as measured by the PoCC metric continued to decrease during this time. This trend was primarily driven by increases in cefepime and piperacillin-tazobactam utilization while meropenem utilization remained relatively constant. This study highlights the importance of looking at normalized antibiotic consumption data and not relative-use data alone.

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Subject Category: Antibiotic Stewardship

Recommendations for antimicrobial stewardship during end-of-life patient care

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Background: Antimicrobials are frequently used during end-of-life care and may be prescribed without a clear clinical indication. Overuse of antimicrobials is a major public health concern because of the development of multidrug resistant organisms (MDROs). Antimicrobial stewardship programs are associated with reductions in antibiotic resistance and antibiotic-associated adverse events. We sought to identify and describe opportunities to successfully incorporate stewardship strategies into end-of-life care. **Methods:** We completed semistructured interviews with 15 healthcare providers at 2 VA medical centers, 1 inpatient setting and 1 long-term care setting. Interviews were conducted via telephone between November 2020 and June 2021 and covered topics related to antibiotic prescribing for hospice and palliative-care patients, including how to improve antimicrobial stewardship during the end-of-life period. We targeted healthcare providers who are involved in prescribing antibiotics during the end-of-life period, including hospitalists, infectious disease physicians, palliative care and hospice physicians, and pharmacists. All interviews were recorded, transcribed, and analyzed using consensus-based inductive and deductive coding. **Results:** End-of-life care, particularly hospice care, was described as an underutilized resource for patients, who are often enrolled in their final days of life rather than earlier in the dying process. Even at facilities with established antimicrobial stewardship programs, healthcare providers interviewed believed that opportunities for antimicrobial stewardship in the hospice and palliative care settings were missed. Recommendations for how stewardship should be incorporated in end-of-life care included receiving feedback on antimicrobial prescribing, increasing pharmacist involvement in prescribing decisions, and targeted education for providers on end-of-life care, including the value of shared decision making with patients around antibiotic use. **Conclusions:** Improved antibiotic prescribing during end-of-life care is critical in the effort to combat antimicrobial resistance. Healthcare providers discussed antimicrobial stewardship activities during end-of-life patient care as a potential avenue to improve appropriate antibiotic prescribing. Future research should evaluate the feasibility and effectiveness of incorporating these strategies into end-of-life patient care.

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Assessment of antibiotic appropriateness in hospitalized veterans with COVID-19 in the VA MidSouth Healthcare Network (VISN9)

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Background: Bacterial coinfections with COVID-19 appear to be rare, yet antibiotic use in this population is high. Limited guidance is available regarding the use of antibiotics in these patients. In response, a multidisciplinary group of physicians and pharmacists from 5 VISN9 facilities developed a guideline for the use of antibiotics with COVID-19 in July 2021. This guideline created a network-wide standard for antibiotic use and facilitates the assessment of antibiotic appropriateness in hospitalized veterans with COVID-19. **Methods:** In this observational, cross-sectional study, we reviewed veterans diagnosed with COVID-19 from August 1 through September 30, 2021, who were admitted to VISN9 facilities. Use of antibiotics was assessed during the first 4 days of admission. If antibiotics were prescribed, their use was determined to be appropriate or inappropriate based on the presence or absence of a finding concerning for bacterial coinfection as outlined in the guideline (Table 1). Additional data including procalcitonin results as well as positive sputum cultures were collected. **Results:** In total, 377 veterans were admitted for COVID-19 during the study period. Among them, 42 veterans (11%) received antibiotics for nonrespiratory infections and were removed from this analysis. Of the remaining 335 veterans, 229 (68%) received antibiotics and 116 (51%) of those met guideline criteria that were concerning for bacterial coinfection. Additionally, 32 (14%) of the 229 veterans who received antibiotics had >1 finding concerning for bacterial coinfection. Procalcitonin levels were obtained in 97 (42%) of 229. Only 33 veterans (14%) who received antibiotics had an elevated procalcitonin, and only 19 (8%) had a positive sputum culture. **Conclusions:** Antibiotic use was common in hospitalized veterans with COVID-19 in VISN9 facilities. This results are comparable to findings in the published literature. Among those receiving antibiotics

Table 1. Findings concerning for bacterial co-infection in patients with COVID-19

Any of the following:
Elevated leukocyte count
Unilateral lobar consolidation on chest imaging
Recrudescence of fever after initial defervescence
Septic Shock