

Do Antibiotic Choices Made in the Emergency Department Influence Inpatient Therapy?



Jones TM¹⁻², Dodds Ashley E¹⁻², Johnson MD¹⁻², Moehring RW¹⁻², Sarubbi C²⁻³, Wrenn R²⁻³

1- Duke Antimicrobial Stewardship Outreach Network, Durham, NC, USA; 2- Duke Center for Antimicrobial Stewardship and Infection Prevention, Duke University Medical Center, Durham, NC, USA; 3- Department of Pharmacy, Duke University Medical Center, Durham, NC, USA



Duke Center for Antimicrobial Stewardship and Infection Prevention

Abstract

Background: Inappropriate antibiotic use (AU) is common among inpatients and may begin in the emergency department (ED). ED clinicians often make the first antibiotic decisions in patient care, but it is unknown whether or not these decisions influence inpatient AU. Understanding prescribing practices at transitions of care is critical for implementing effective stewardship initiatives.

Methods: We performed a retrospective study of AU in patients admitted to Duke University Hospital through the ED between July and December 2018. Included encounters had a minimum 2-day length of stay and received an antibiotic in both the ED and inpatient setting. Individual encounter IDs were used to link ED and inpatient AU reports generated from the DASON Antimicrobial Stewardship Assessment Portal. We compared the last ED administration date/time to the first inpatient unit administration for each individual agent. An antibiotic started in the ED was considered continued upon admission if the first inpatient administration occurred within 30 hours following the last ED administration. Demographic, clinical indication on order entry, length of therapy, and prescriber data were also collected.

Results: We included 3,336 encounters and 2,940 unique patients in the analysis. The median (IQR) patient age was 60 (42-72) years, and the most common indications for AU in the ED were sepsis (23.1%), pneumonia (17.8%), ABSSSI (15.5%), and intra-abdominal infection (12.8%). At least one antibiotic initiated in the ED was continued upon admission within 30 hours in 2,495 (74.8%) encounters. The most common antibiotics continued upon admission were piperacillin/tazobactam (32.8%), vancomycin (24.9%), and ceftriaxone (13.7%). The most common indications for agents continued upon admission were pneumonia (18%), intra-abdominal infection (15%), and ABSSSI (15%). Two or more antibiotics were continued upon admission in 916 (27.4%) encounters.

Conclusion: In our retrospective review of ED antibiotic encounters resulting in admission for at least 2 days, three out of four encounters had at least one antibiotic continued upon admission. This finding highlights the importance of initial appropriate antibiotic selection and suggests stewardship interventions should target EDs as well as inpatient prescribing.

Background

- Inappropriate antibiotic use (AU) is common among hospitalized patients and may begin as early as the emergency department (ED).
- ED clinicians may make first antibiotic decisions with minimal available data. It is unknown if these decisions influence inpatient AU.
- Understanding prescribing practices at transitions of care is critical for implementing effective stewardship initiatives and education.

Methods

- Retrospective analysis of ED and inpatient AU in adult and pediatric patients admitted to Duke University Hospital from the ED between July and December 2018.
- Included encounters had a minimum 2-day LOS and received an antibiotic in the ED and inpatient settings.
- Encounter IDs were used to link ED and inpatient AU reports generated from the DASON Antimicrobial Stewardship Assessment Portal (ASAP).
- The last ED administration date/time was compared to the first inpatient administration for each agent.
- An ED antibiotic was considered continued upon admission if the first inpatient administration occurred within 30 hours following the last ED administration.
- Demographic, prescriber-reported clinical indication on order entry, and prescriber data were also collected.

Results

Unique ED antimicrobial encounters (patients) with inpatient LOS ≥ 2d		3,336 (2,940)	
Age in years (median, IQR)		60 (42-72)	
Female, N (%)		1476 (50.2%)	
Inpatient LOS in days (median, IQR)		5 (3-8)	
Count of agents administered per unique ED encounter (median, range)		2 (1-7)	
ED Antibiotic Indications, N (%)	ED Administered Antibiotics, N (%)		
sepsis	1286 (38.5%)	piperacillin/tazobactam	1454 (43.6%)
pneumonia	1027 (30.7%)	vancomycin IV	1310 (39.3%)
skin/soft tissue	896 (26.9%)	ceftriaxone	793 (23.7%)
intra-abdominal	753 (22.6%)	azithromycin	359 (10.8%)

Results

Figure 1. Description of ED Encounters and Percent of Encounters with ED-initiated Antimicrobials Continued Upon Admission

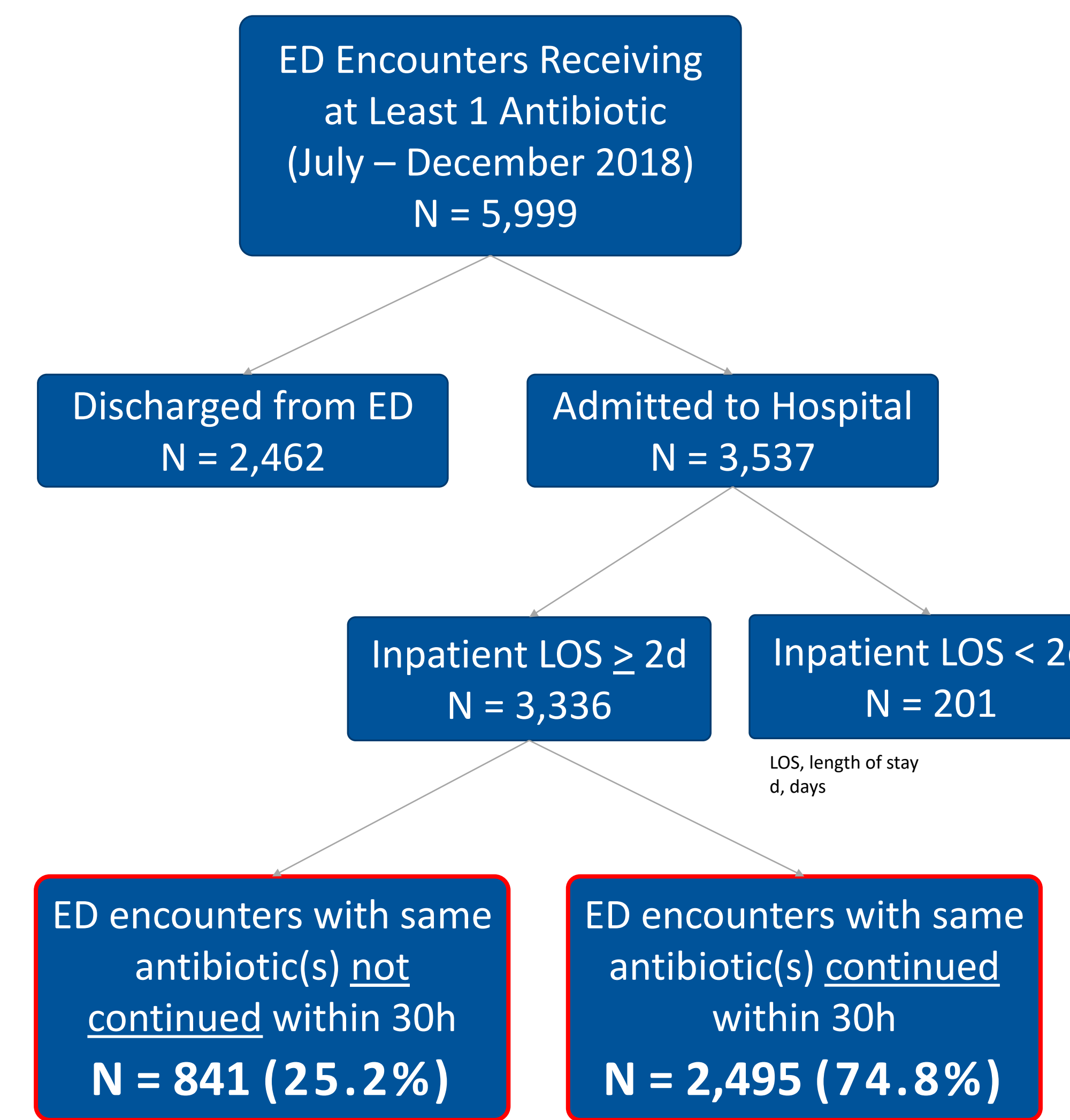


Figure 2. Continuation Rates for the Top 15 Antibacterials Prescribed in the ED

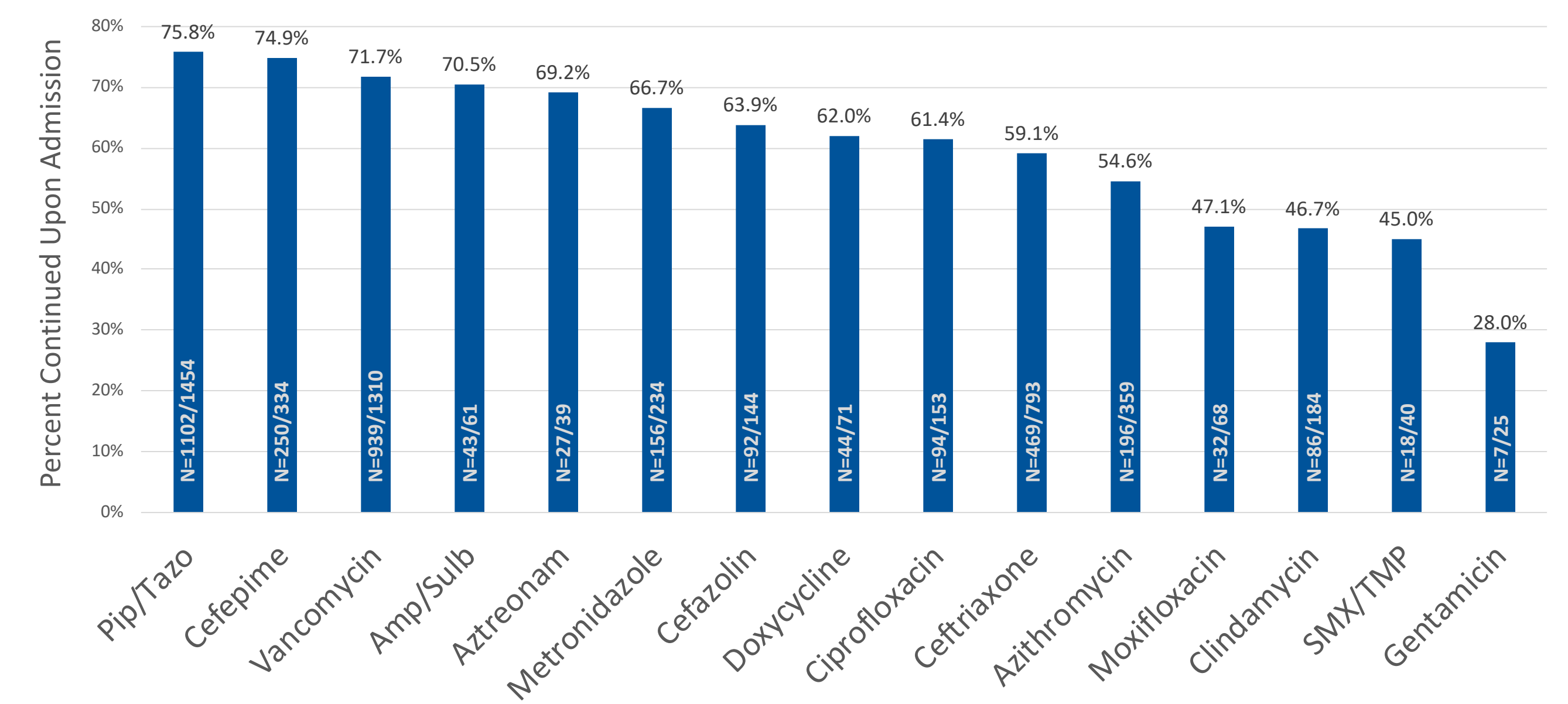
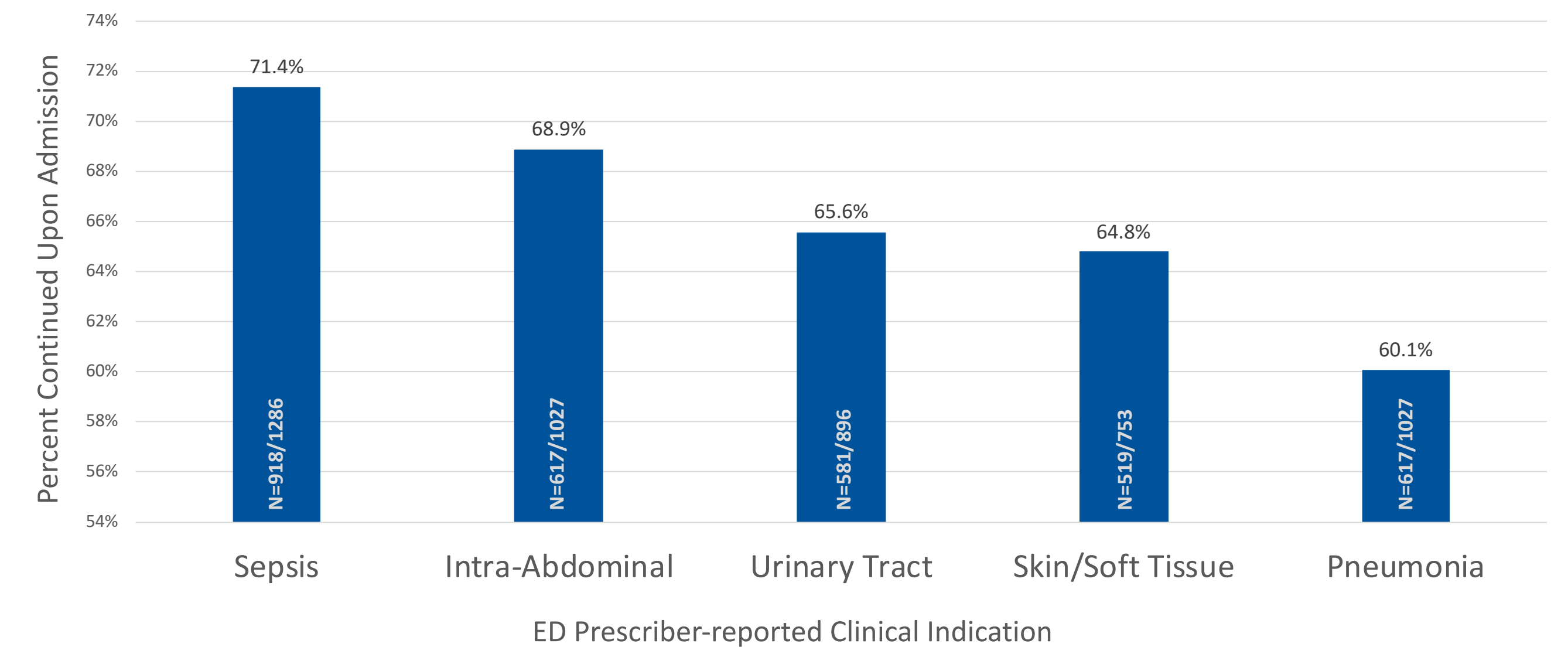


Figure 3. Continuation Rates for the Top 5 ED-reported Clinical Indications



Conclusions

- In our retrospective review of ED antibiotic encounters resulting in admission for at least 2 days, three out of four (75%) encounters had at least one antibiotic continued upon admission.
- This finding highlights the importance of initial appropriate antibiotic selection and suggests stewardship interventions and education should target EDs as well as inpatient prescribing.

