

Seeing the Full Picture: Adding Discharge Antibiotic Durations to the Dashboard

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for the CDC Prevention Epicenters Program

Disclosures

- Nothing relevant to disclose

- This work is funded by CDC Prevention Epicenter Program
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Background

- Antibiotic use at hospital discharge is often inappropriate

Yogo N et al. *Infect Control Hosp Epidemiol* 2015;36:474-8

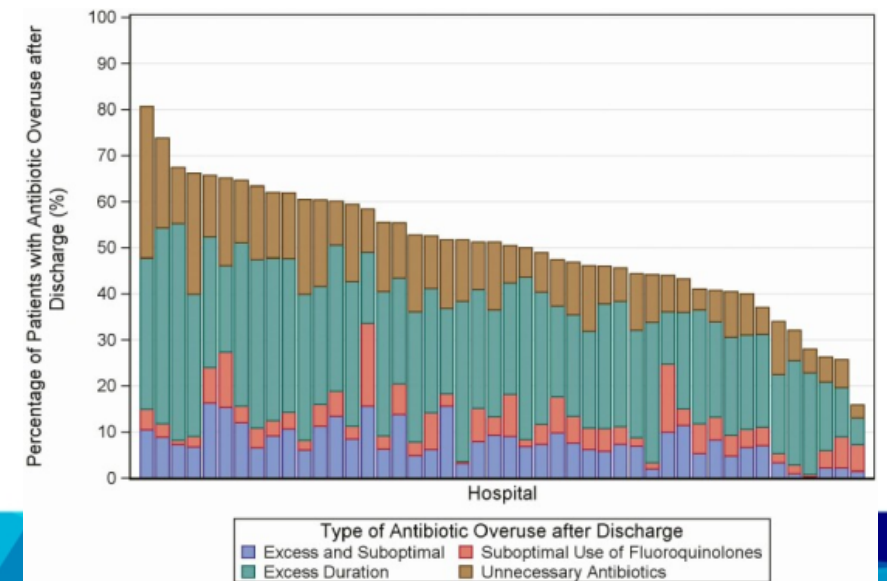
- Much of the total antibiotic duration occurs post-discharge

- Previous DASON experience suggests 38% of antibiotic use is post-discharge

Dyer AP et al. *Infect Control Hosp Epidemiol* 2019;40:847- 54.

- For pneumonia and UTI antibiotic overuse at discharge was common

Vaughn VM et al. *Clin Infect Dis* 2021;73:e4499-e4506



Primary Aim

Create a data extract for discharge antibiotic prescriptions and incorporate this into existing data infrastructure regarding antibiotic use at hospitals within the Duke Antimicrobial Stewardship Outreach Network (DASON) and Duke University Health System (DUHS)

Data Extraction Process

- Data specifications
 - 36 data fields
 - Includes only drugs within the therapeutic class of anti-infectives, code 8.00 per AHFS drug information
 - Data extract included administration instructions and quantity dispensed
- All extracts reviewed for:
 - Orders per day
 - Agents not reported
 - All agents and routes represented
 - Ordered drug summary (ordered, d/c, min/max duration)
 - Ordered drug summary excluding discontinued drugs
 - % with unknown duration

Inclusion/Exclusion

- Inclusion:
 - All antibiotic prescriptions written at discharge from a facility
- Exclusion:
 - Antiretrovirals & anti-COVID medications
 - All prescriptions discontinued within reporting window
 - Any non-enteral medications
 - Prescriptions missing durations for the discharge prescription
 - Prescription duration > 30 days

Calculations and Definitions

- Outpatient Duration- derived from administration instructions and prescribed quantity
- Inpatient Duration- MAR derived total number of antimicrobial days without consideration for number of agents given
- Clinical Indication- prescriber provided reason for use in the inpatient antibiotic order most proximal to hospital discharge

Preliminary Antibiotic Data CY2023 (n=21 hospitals)



313,292
antimicrobial Rx at
D/C

Excluded:
Antiviral (3,702)
Discontinued (34,115)
Non-enteral (2,678)
Missing Duration (12,203)
>30 day duration (4,153)

256,441 included
(195,184 patients)

Prescription Characteristics

1-9

Number of Outpatient
Prescriptions per Encounter



Outpatient Duration
Range: 1-30 Days



Average Total Durations: 9.27 Days

Top Agents- All Locations

Antibiotic	Number of Prescriptions	Mean Outpatient Duration in Days (SD)	Mean Total Duration (SD)	% of Total Duration Given As Outpatient
Cephalexin	33676	8 (2.44)	9 (2.96)	89%
Amoxicillin with Clavulanate	32251	8 (3.08)	10 (4.32)	80%
Doxycycline	25332	8 (3.44)	10 (4.26)	80%
Amoxicillin	21700	9 (2.02)	9 (2.76)	100%
Sulfamethoxazole with Trimethoprim	19009	8 (4.3)	9 (6.29)	89%
Ciprofloxacin	17772	7 (3.85)	9 (5.36)	78%
Metronidazole	13662	8 (3.52)	10 (5.25)	80%
Clindamycin	12386	9 (2.14)	10 (2.78)	90%
Nitrofurantoin	11848	7 (2.35)	7 (2.73)	100%
Azithromycin	11328	5 (2.41)	6 (3.35)	83%
Levofloxacin	10239	7 (4.61)	11 (6.86)	64%
Cefdinir	10164	7 (3.17)	9 (3.5)	78%
Cefuroxime	9268	6 (3.01)	8 (3.73)	75%
Fluconazole	7009	4 (5.64)	7 (8.88)	57%
Oseltamivir	5274	5 (1.1)	6 (1.25)	83%
Penicillin V	3162	10 (2.24)	10 (3.11)	100%
Valacyclovir	2583	8 (4.48)	10 (5.8)	80%
Vancomycin	1412	9 (4.51)	16 (9.25)	56%
Cefadroxil	1378	9 (4.64)	12 (5.91)	75%
Acyclovir	1025	11 (7.01)	13 (13.82)	85%

96,900 (38%) had no prior antibiotic use during encounter



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256,441 included
(195,184 patients)

190,962 non-
Inpatient
Discharge
Rx

65,479 Rx at
inpatient D/C



Top Agents- Inpatient Discharges Only

2,707 (4%) had no inpatient antibiotic use

Antibiotic	Number of Prescriptions	Mean Outpatient Duration In Days (SD)	Mean Total Duration (SD)	% of Total Duration Given As Outpatient
Amoxicillin with Clavulanate	11372	7 (4.38)	12 (5.99)	58%
Doxycycline	6883	7 (4.9)	12 (6.56)	58%
Levofloxacin	6658	7 (5.2)	12 (7.87)	58%
Ciprofloxacin	6110	7 (5.42)	12 (7.6)	58%
Metronidazole	5106	8 (4.81)	13 (7.23)	62%
Cefdinir	4720	5 (3.43)	9 (4.66)	56%
Cefuroxime	3964	6 (3.59)	10 (4.73)	60%
Cephalexin	3541	7 (4.18)	11 (5.98)	64%
Sulfamethoxazole with Trimethoprim	2832	11 (8.59)	17 (12.56)	65%
Azithromycin	1934	5 (5.32)	8 (7.4)	63%
Fluconazole	1896	8 (7.49)	15 (11.94)	53%
Nitrofurantoin	1260	7 (5.08)	9 (6.05)	78%
Vancomycin	1222	9 (4.67)	17 (9.57)	53%
Clindamycin	1217	8 (4.21)	12 (6.23)	67%
Amoxicillin	879	8 (5.71)	13 (10.23)	62%
Oseltamivir	869	4 (2.19)	7 (2.15)	57%
Linezolid	854	9 (5.02)	17 (8.13)	53%
Cefadroxil	694	10 (5.91)	14 (7.04)	71%
Valacyclovir	558	9 (7.54)	14 (9.49)	64%
Nystatin	528	9 (3.93)	16 (8.57)	56%



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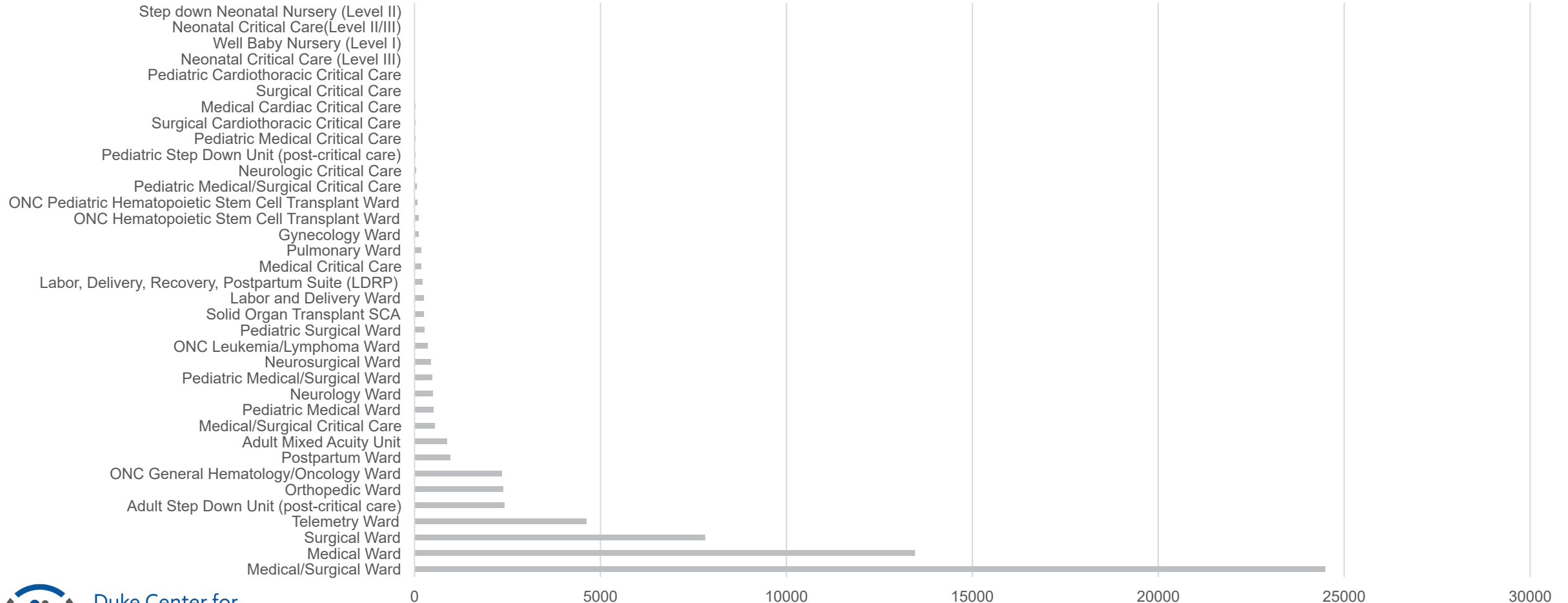


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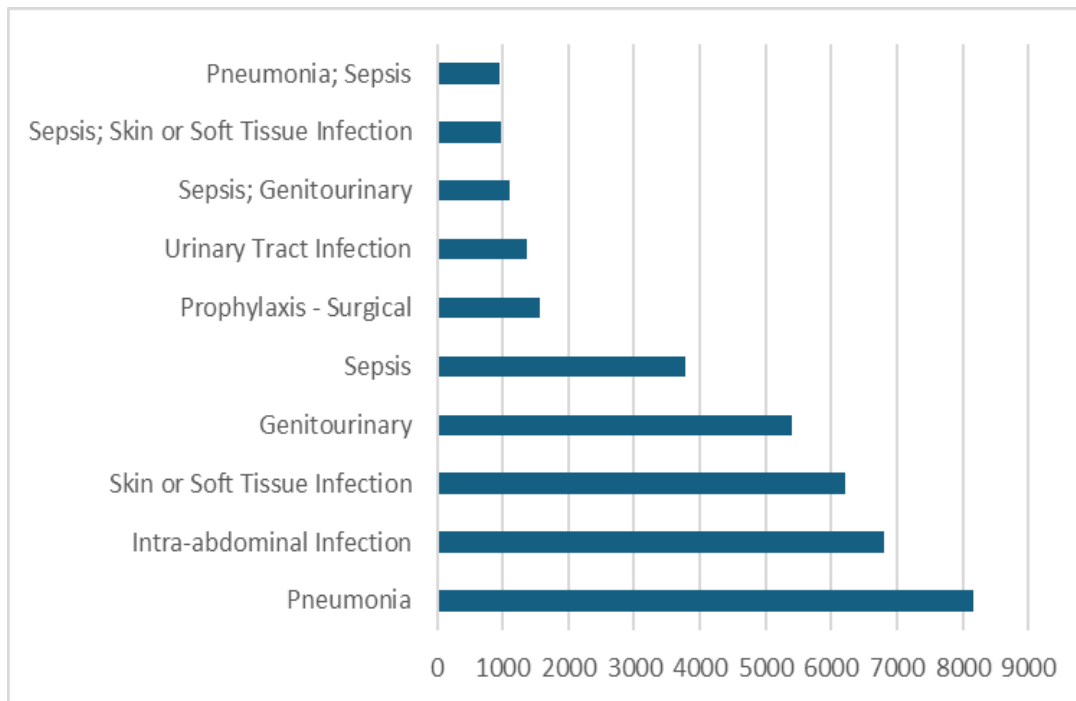
Prescription Count by Discharge Location



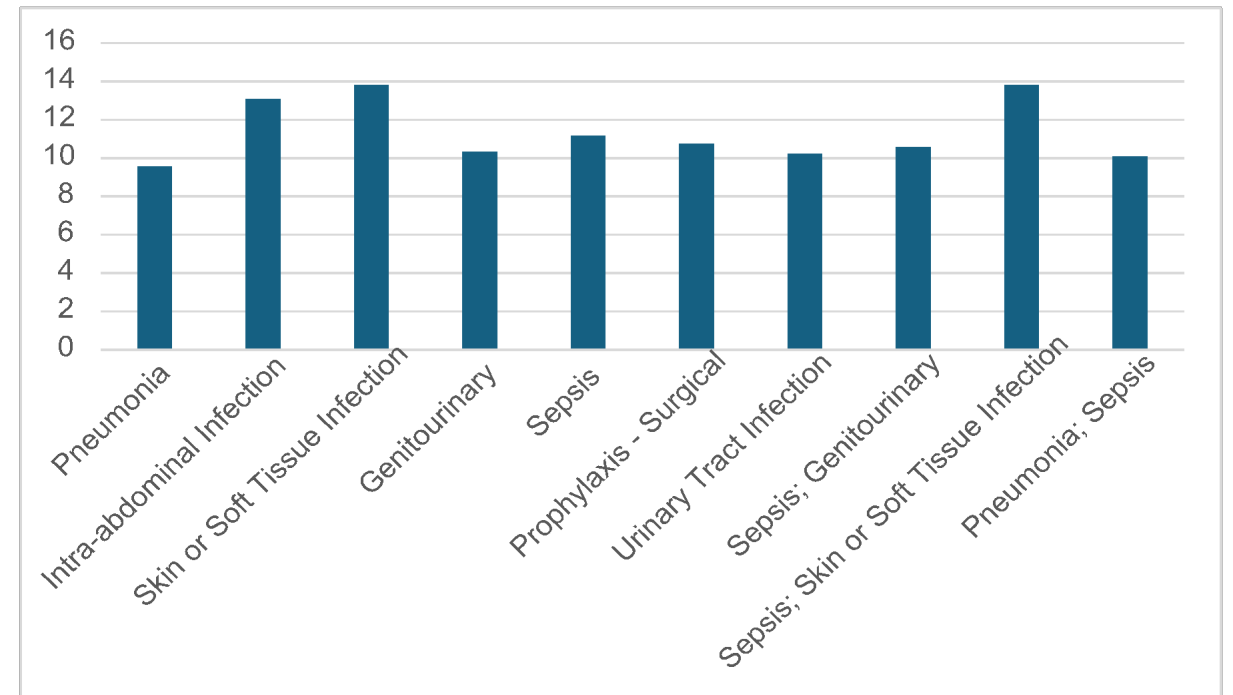
Indications: Inpatient Discharges

Clinical indications were extracted where possible using the prescriber provided reason for use in the inpatient antibiotic order most proximal to hospital discharge

Prescription Count



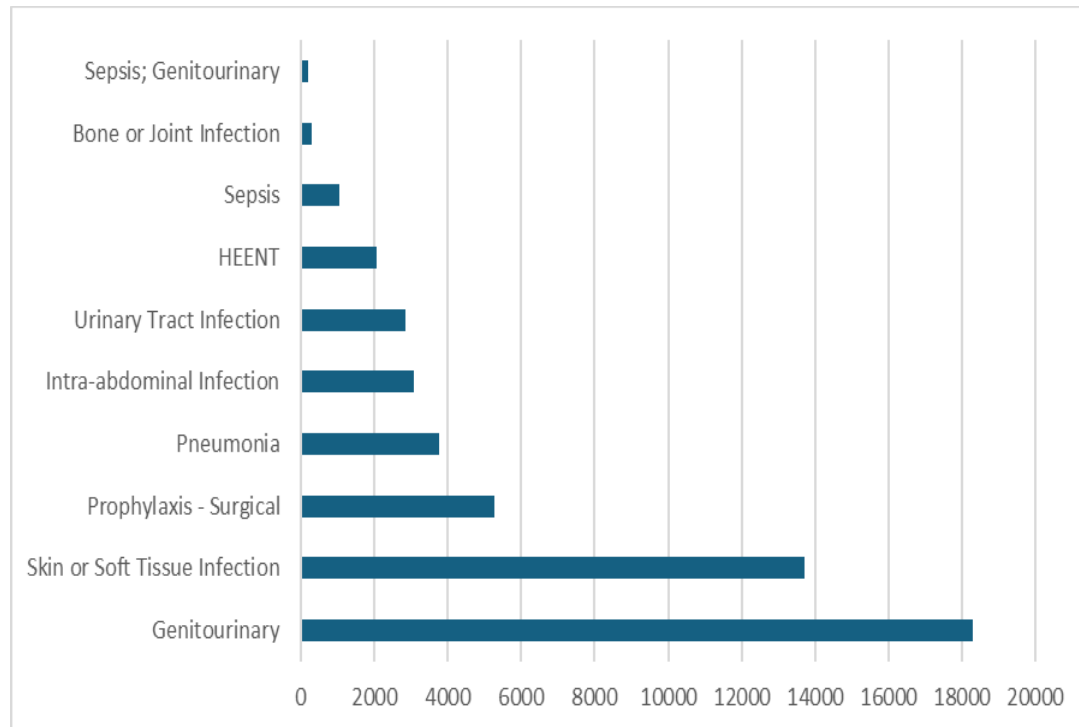
Average Duration of Most Common Indications



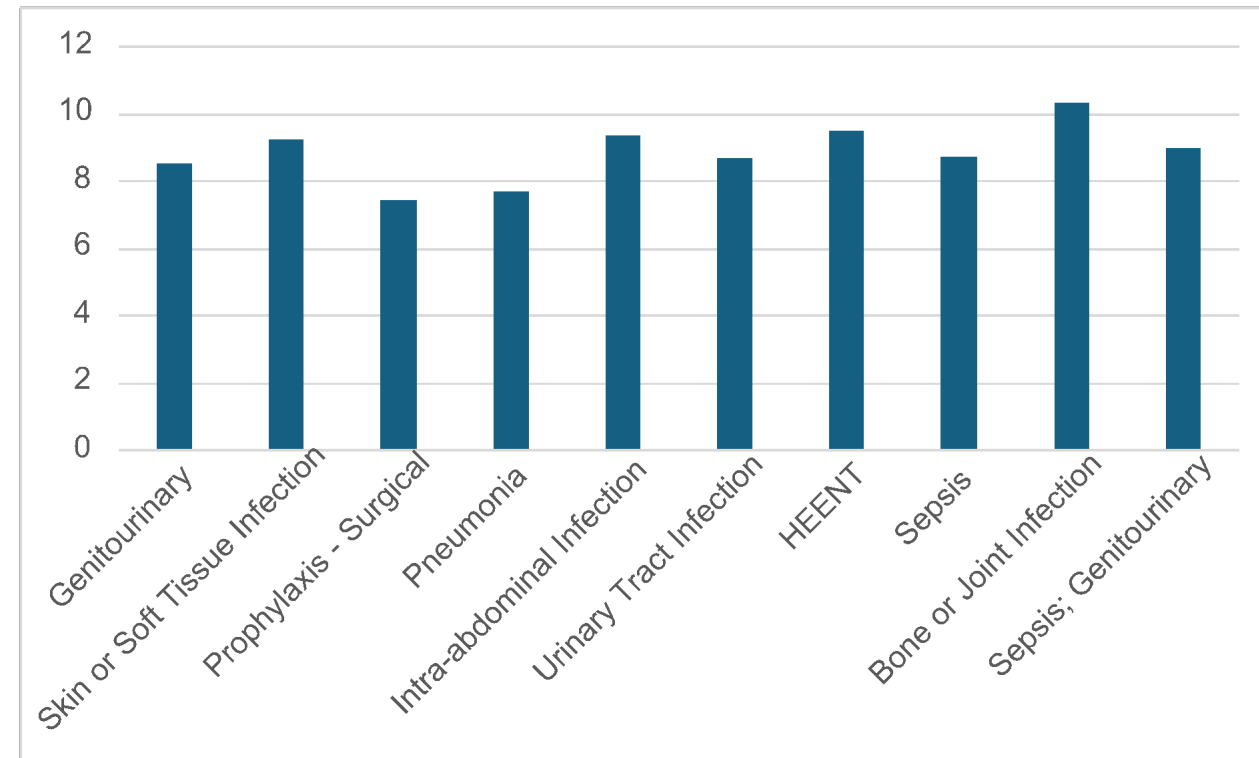
Indications: Non-Inpatient Discharges

Clinical indications were extracted where possible using the prescriber provided reason for use in the inpatient antibiotic order most proximal to hospital discharge

Prescription Count



Average Duration of Most Common Indications



Of 52,846 with available indication data (28%)

Key Considerations

- The data obtained via discharge prescriptions only shares prescriber intent, and notably excludes:
 - Whether the prescription was actually filled and retrieved for the patient
 - Adherence to the prescription if filled
 - Changes to antibiotic prescriptions occurring at post-discharge follow-up visits
- We inferred that discharge antibiotic prescriptions were a continuation of inpatient treatment course. Without full chart review, it is possible some of this antibiotic use was for treatment of a de novo infection.

Summary

- Antibiotics prescribed at discharge remain a significant contributor to total antibiotic course for hospitalized patients
- Discharge antibiotic data can be integrated with hospital antibiotic use data to capture a more complete understanding of total hospital-related antibiotic courses
- This remains a robust area for potential stewardship intervention

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