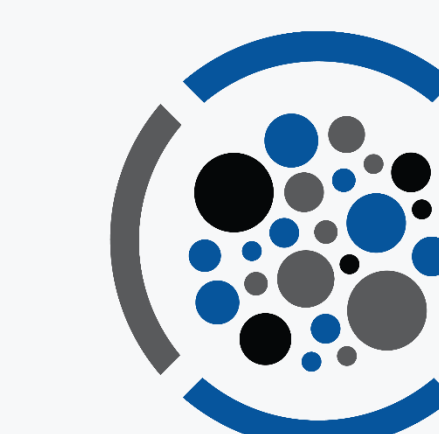


Opportunities for Antimicrobial Stewardship in Febrile Neutropenia



Christopher Shoff^{1,2}, Julia Messina^{1,2}, Jordan Baskett³, Arthur Baker², Nicholas Turner^{1,2}, Justin Spivey^{1,2}, Rebekah Wrenn^{1,2}, Rebekah Moehring^{1,2}, and S. Shaefer Spires^{1,2}

1- Duke Antimicrobial Stewardship and Evaluation Team, Durham, NC, USA; 2- Division Of Infectious Diseases, Duke University Medical Center, Durham, NC, USA; 3- Division of Hematology/Oncology, Duke University Medical Center, Durham, NC, USA



Duke Center for Antimicrobial Stewardship and Infection Prevention

Background

Antibiotic de-escalation remains controversial in the treatment of patients with febrile neutropenia (FN), with practices varying widely from center to center in the absence of concordant guidelines. IDSA guidelines¹ recommend antibiotic continuation until resolution of neutropenia, while the ECIL² encourages antibiotic de-escalation after 72 hours if the patient is stable and has been afebrile for 48 hours. Recent studies increasingly support early de-escalation.

We evaluated antibiotic utilization for febrile neutropenia at Duke University Hospital using antibiotic indications data.

Methods

- **Design:** Retrospective cohort study queried from antibiotic utilization data at Duke University Hospital from 5/21/2018 to 12/31/2019
- **Study Population:** Adult inpatient encounters on the hematologic malignancies ward receiving at least one antibiotic for febrile neutropenia indication. Encounters with blood cultures were stratified into a positive or negative culture cohort
- **Outcome:** Length of therapy (LOT) of broad Gram-negative agents (cefepime, piperacillin-tazobactam, meropenem, aztreonam) for any indication
- **Statistics:** Descriptive statistics with creation of Gaussian density function. All analysis performed in R.

Methods

Unique encounters with antibiotic indication of FN (n = 471)

Encounters with positive blood culture (n = 122)

Encounters with negative blood culture (n = 321)

Total antibiotic administrations within FN cohort (n = 50,595)

Results

- Broad Gram-negative (GN) agents (cefepime, piperacillin/tazobactam, meropenem, and aztreonam) comprised 15,678 antibiotic administrations evaluated (Table 1).

Table 1. GN utilization by agent in patients receiving antibiotic therapy for indication of febrile neutropenia

GN Antibiotic Agent	Days of Therapy
Cefepime	3,401
Piperacillin/tazobactam	1,724
Meropenem	517
Aztreonam	207

Results

- 122 (27.5%) encounters were associated with at least one positive blood culture; 321 (72.5%) encounters had no positive blood cultures throughout the admission
- Most commonly isolated GN pathogens were *E. coli* (24), *K. pneumoniae* (17), and *P. aeruginosa* (12)

- Overall median GN LOT was 7 days (range 1 – 44 days)

- GN LOT was statistically longer in the positive cohort (median 10.5 days vs. 6 days, $p < 0.0001$) (Fig 1.)

- Among patients with negative blood cultures, 57 (17.8%) encounters received empiric GN therapy for > 14 days, accounting for 44% of all GN days in that subgroup (Fig. 2)

Fig 1. GN LOT by cohort

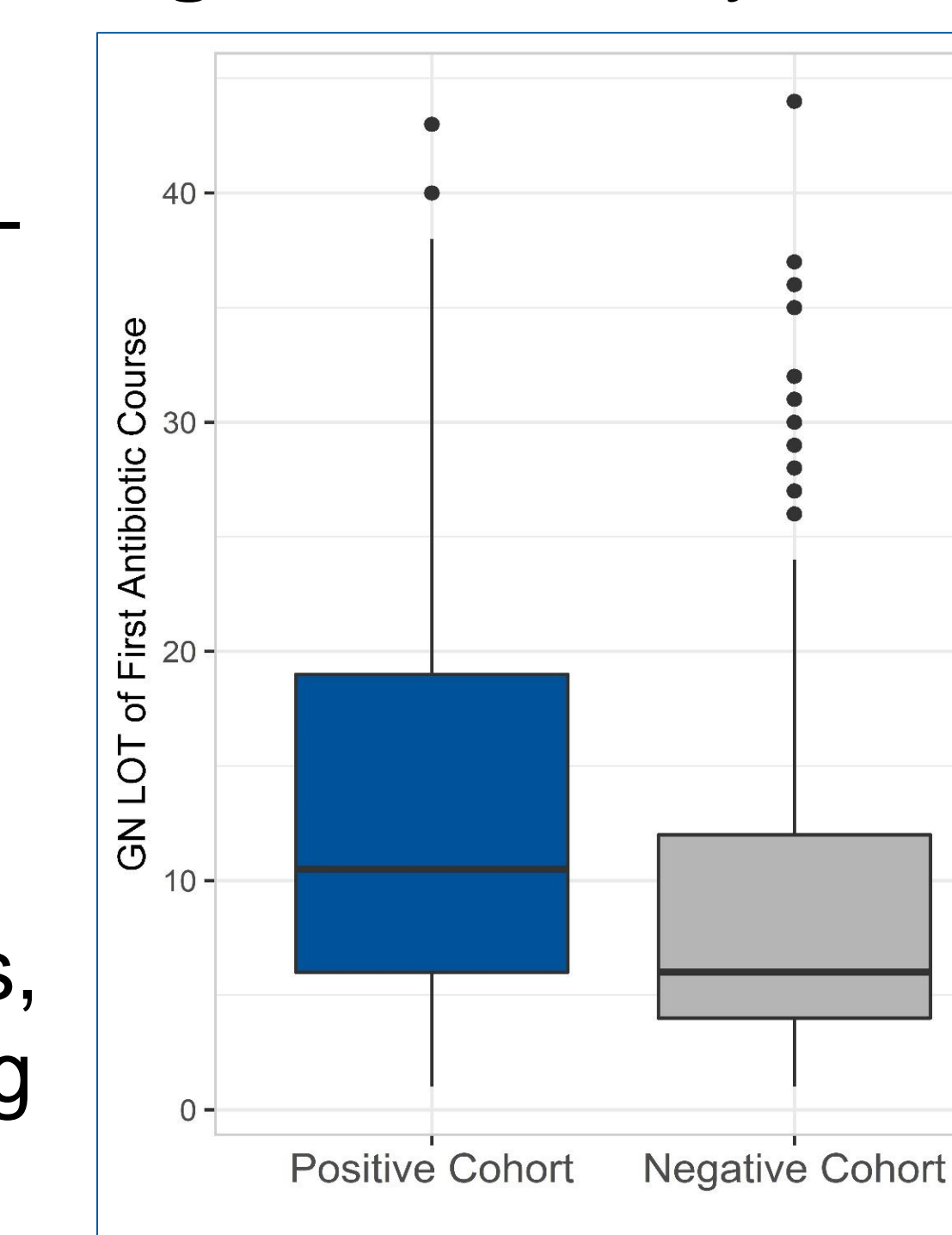
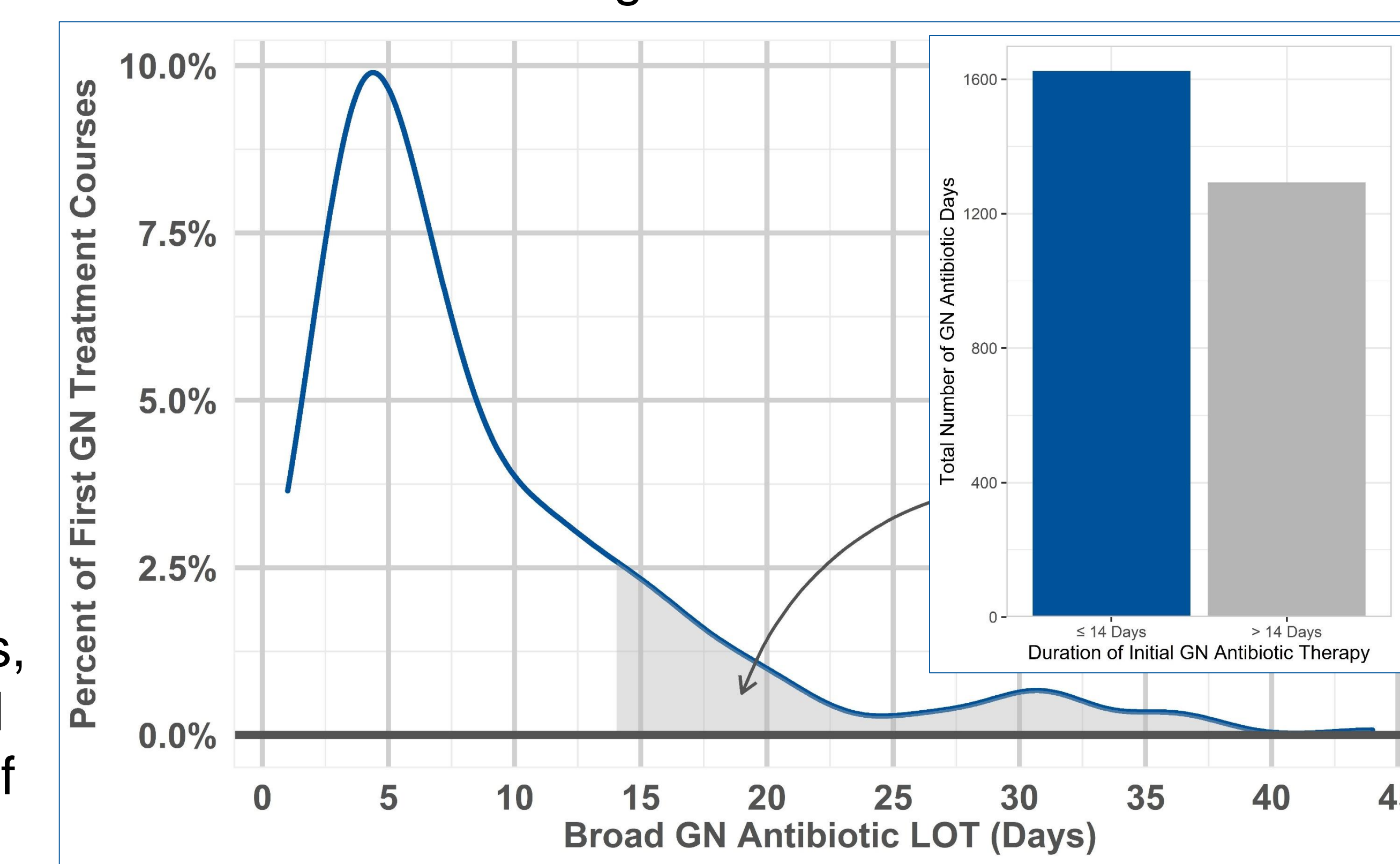


Fig 2. Gaussian density function of Broad GN Antibiotic LOT in blood culture negative cohort.



Conclusions

- Despite increasing evidence for de-escalation, patients with blood culture negative FN often received prolonged empiric therapy awaiting resolution of neutropenia
- One-fifth of patients comprised almost 50% of antibiotic utilization in the negative cohort—a prime target for antimicrobial stewardship intervention



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