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Edward Lyon

Children's Mercy Hospital

Jennifer Goldman

Children's Mercy Kansas City

Brian Lee

Children's Mercy Hospital

Margaret Campbell

Children's Mercy Kansas City

Rangaraj Selvarangan

Children's Mercy Hospital

See next page for additional authors

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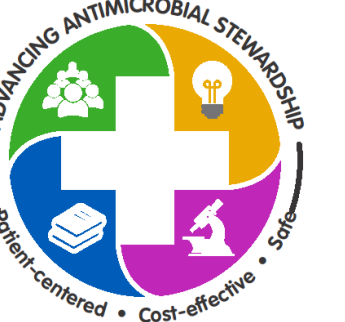
Authors

Edward Lyon, Jennifer Goldman, Brian Lee, Margaret Campbell, Rangaraj Selvarangan, and Elizabeth Monsees

Repeat Tracheal Aspirates in Pediatric Intensive Care Patients: Frequency, Resistance and Antimicrobial Use



Edward Lyon DO, MA; Jennifer Goldman MD, MSCR; Brian Lee PhD, MPH; Margaret Campbell, MD; Rangaraj Selvarangan BVSc, PhD, D(ABMM), FIDSA, F(AAM); Elizabeth Monsees PhD, MBA, RN, CIC, FAPIC



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Introduction

- Tracheal aspirates (TA) are obtained in the PICU on intubated or tracheostomy dependent patients
 - Ordered when clinical changes occur
 - Are challenging to interpret leading to:
 - Colonization vs new infection?
 - Clinically useful results?
- UNKNOWN: Frequency of patients who have more than 1 TA collected during a single PICU admission**

Objectives

- Determine frequency of repeat TAs
- Calculate frequency of multi-drug resistant organisms (MDRO)
- Develop a bacterial profile of pathogens
- Examine antibiotic use
- Understand clinical reasons for collection

Methods

- Retrospective chart review
- 63 patients admitted between 2018 - 2019 with ≥ 2 TA cultures
- 256 TA cultures met criteria for inclusion
- Collected: microbiology, antibiotic susceptibilities, antibiotic exposure, and patient condition
- Descriptive statistics to calculate frequency of repeat TA collection, time between collections, reason for collection and MDRO frequency

Results

Table 1 Demographic Information		
Sex		
Male	0.65	N = 41
Female	0.35	N = 22
Age		
<1yr	0.29	N = 18
1yr-5yr	0.40	N = 25
>5yr	0.32	N = 20
Race		
White	0.65	N = 41
Black	0.14	N = 9
Hispanic	0.14	N = 9
Multi-Racial	0.03	N = 2
Other	0.03	N = 2
Admitting Service		
Medical ICU	0.71	N = 45
Cardiac ICU	0.29	N = 18
Length of Stay		
Median	43 days	[20, 116.5]
Average	108 days	

Figure 1. Number of Tracheal Aspirate Cultures per patient

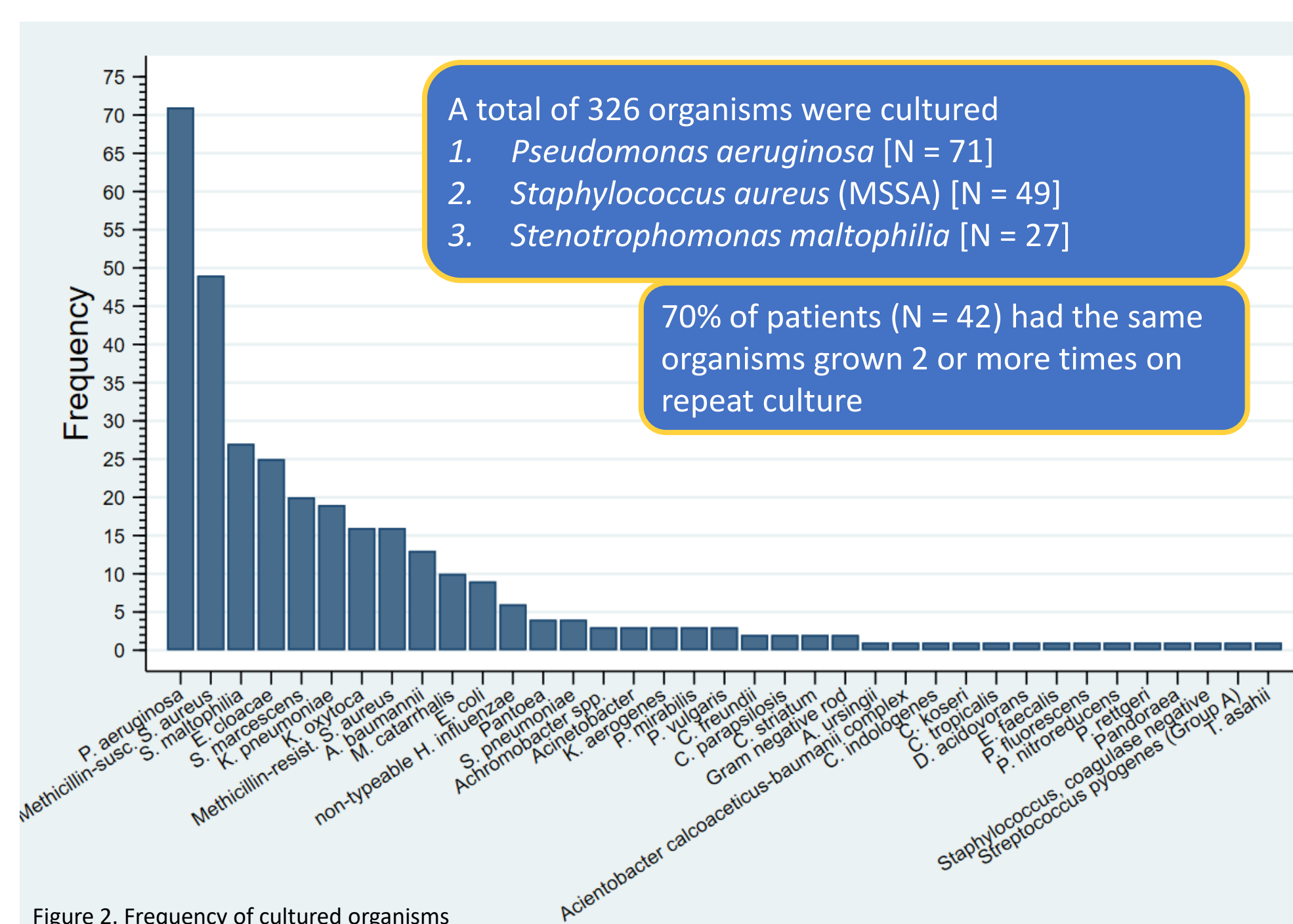
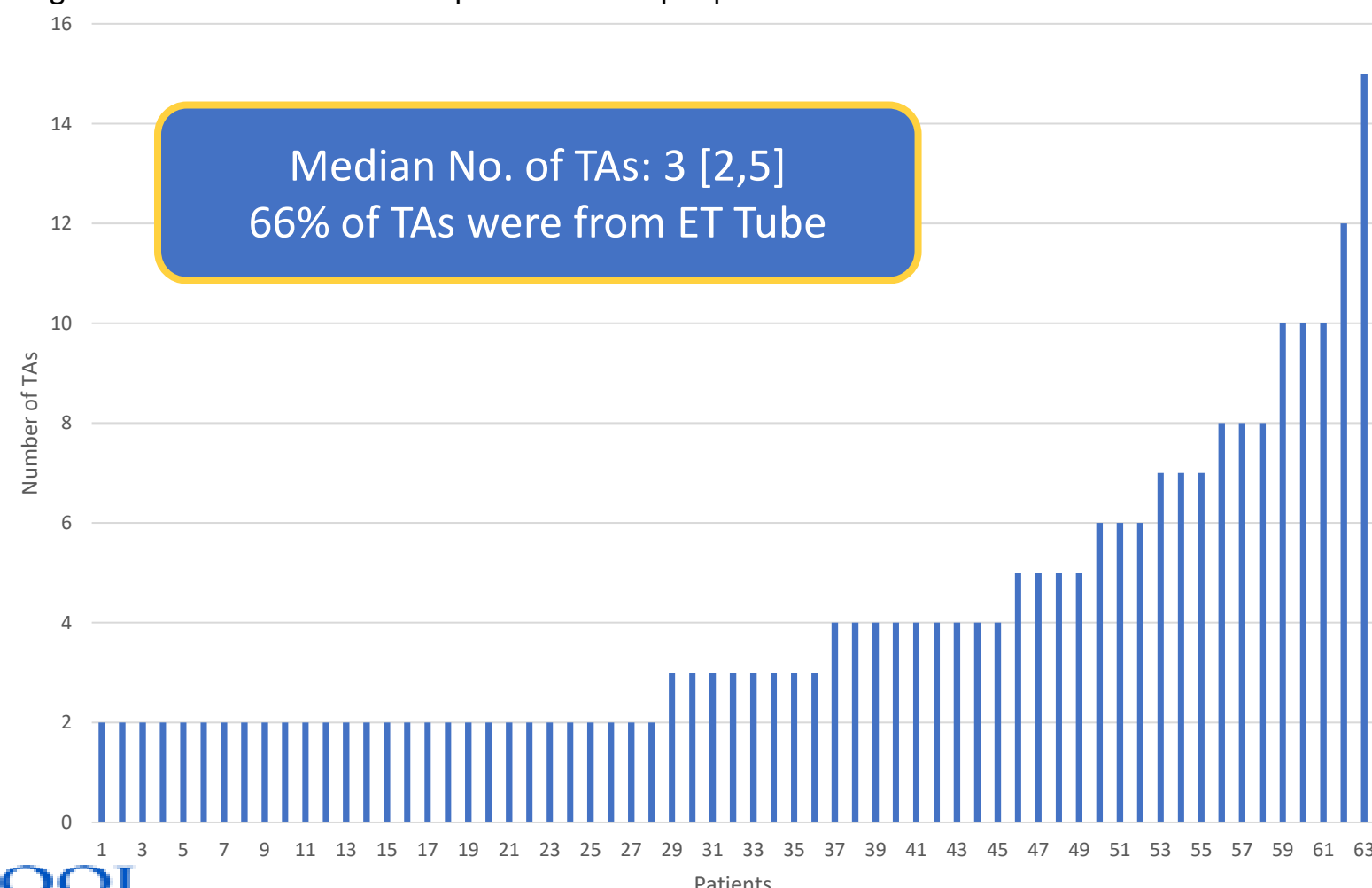


Figure 2. Frequency of cultured organisms

Figure 3. Time between tracheal aspirate cultures

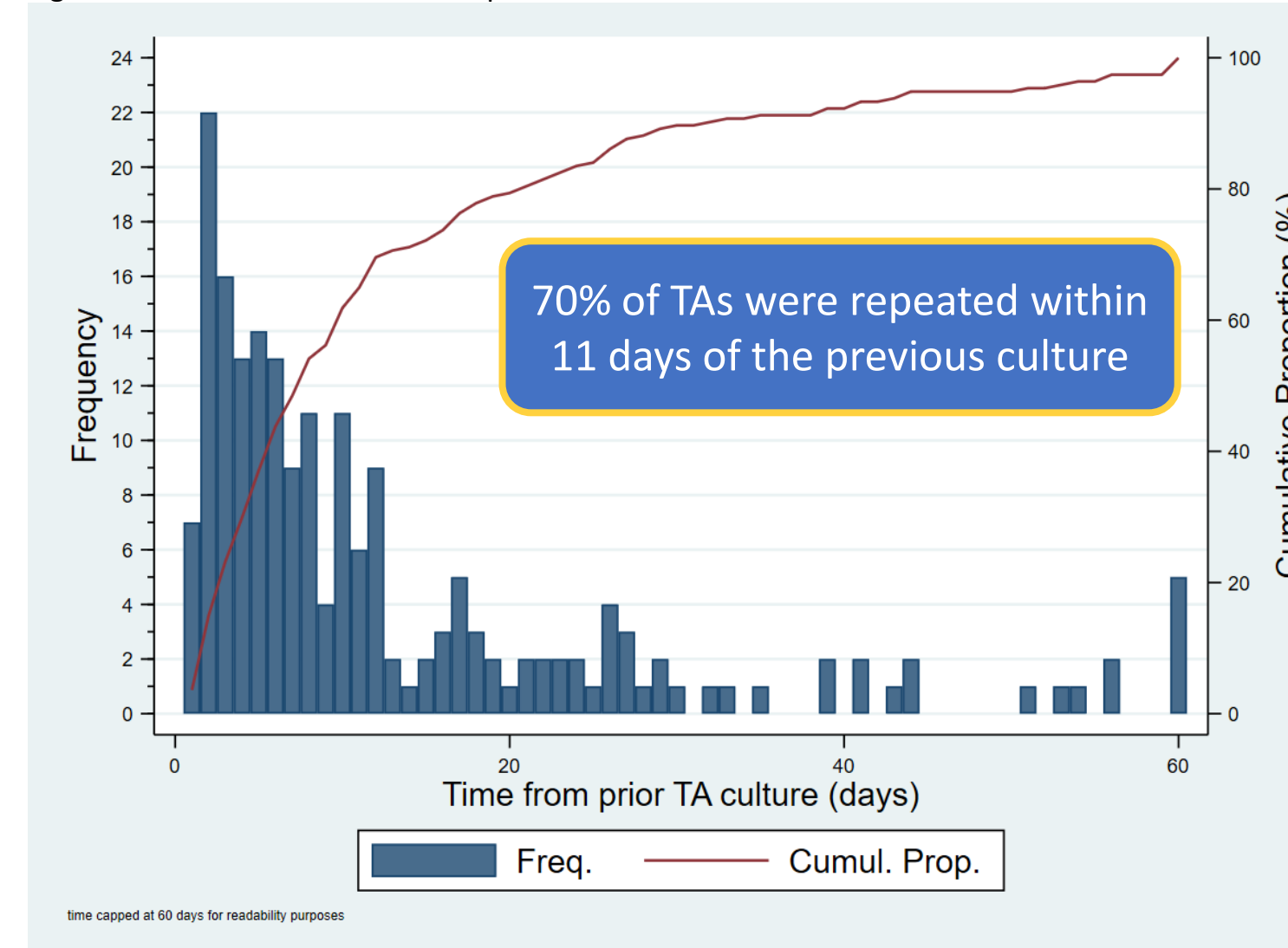
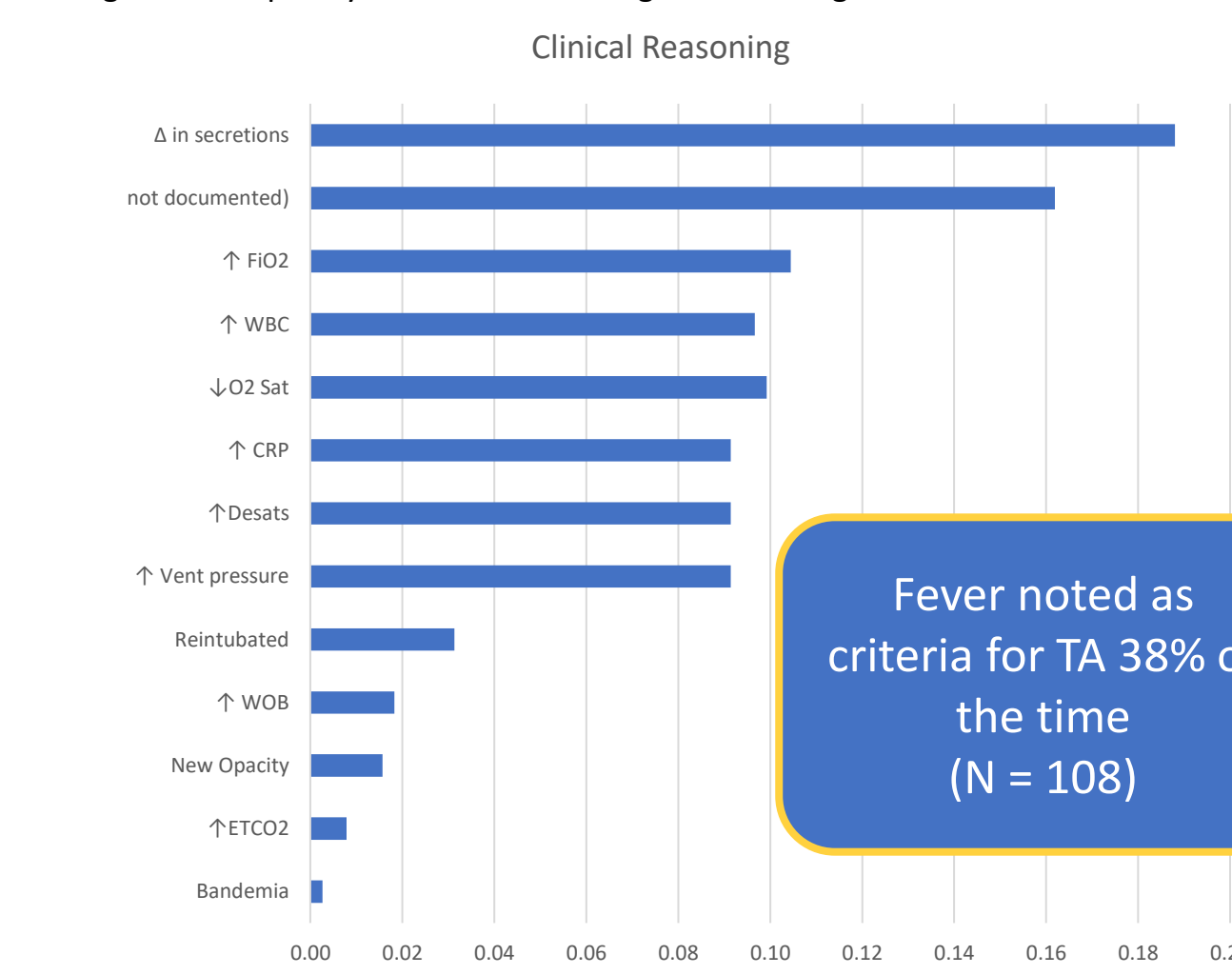


Table 2 Antibiotic Exposure and ASP intervention		
Antibiotic Days		Percentage
Total Days	1517 days	
Days for treatment of TA	447 days	29%
Resistance Development		Percentage
TAs with resistance	N = 16	25%
Median Antibiotic Days Before Resistance		IQR
4x MIC increase (N =12)	19 days	[12, 24]
MDRO (N=4)	48 days	[29, 60]
Antibiotic Stewardship Involvement and Intervention		Percentage
No. of TAs Reviewed	N = 124	48%
No. with ASP Recommendation	N = 46	18%
Antibiotic Stewardship Recommendations		Percentage
Stop Antibiotic	N = 6	13%
Change Antibiotic Type	N = 16	35%
Change duration or dose	N = 11	24%
Obtain ID consultation	N = 13	28%

Figure 4. Frequency of clinical reasoning for obtaining TA culture



Discussion

- Frequency of repeat TA is high
- Frequency of the same pathogen cultured in repeat samples is high
- Development of antibiotic resistance is common
 - Found in 25% of cultures
- Only 29% of TAs are treated with antibiotics

Next Steps

- Develop standard work and collaborative process measures with PICU partners
- Consider algorithm to guide:
 - Modified clinical pulmonary infection score application
 - Minimum duration between cultures
- Continue stewardship work to shorten length of therapy, when appropriate

