Figure 1: Ribotype Distribution by Clinical Diagnosis

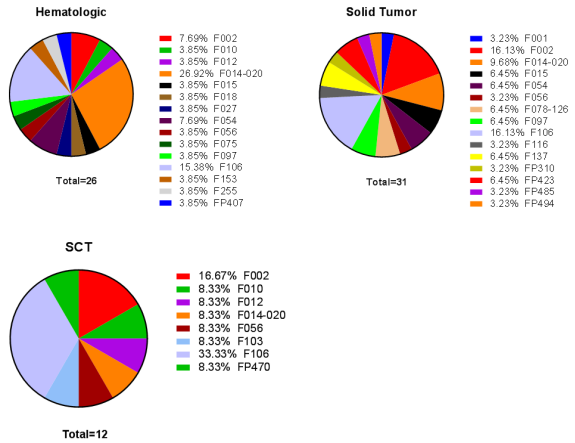


Table 2: Discrimination Indices Between Clinical Groups

Group	No. of Types	Largest Type	Size (%) of the Largest Type	Simpson Diversity Index	Shannon Diversity Index
Hematologic	15	F014-020	27%	0.911	2.41
Solid Tumor	15	F106	16%	0.938	2.54
		F002	16%		
Stem Cell Transplant	8	F106	33%	0.894	1.91
Total	25	F106	19%	0.919	

(H vs S) t=0.904, p=0.372; (H vs SCT) t=3.30, p=0.002; (S vs SCT) t=5.88, p>0.001

Figure 2A: Fecal Biomarkers

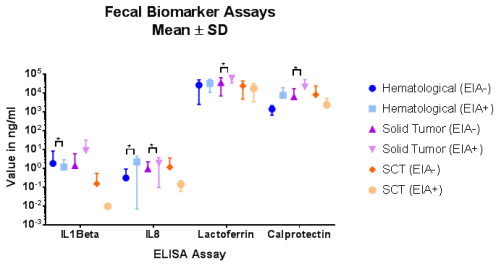
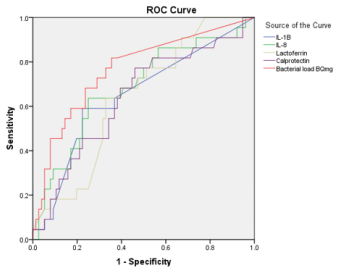


Figure 2B: ROC curves - Fecal Biomarkers and Fecal Bacterial Loads



Disclosures. **All authors:** No reported disclosures.

2236. Stool-Derived Inflammatory Mediators Serve as Biomarkers of Severity in *Clostridium difficile* Infection

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Session: 245. Biomarkers of Infectious Diseases

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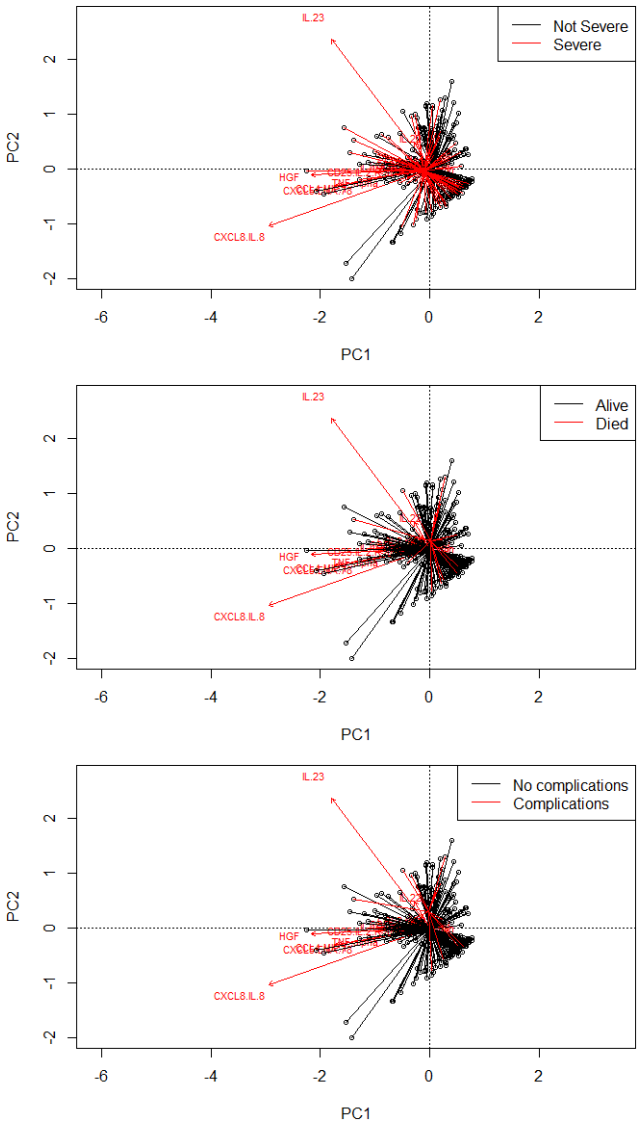
Background. *Clostridium difficile* infection (CDI) is a major public health concern and frequently results in severe disease, including death. Predicting subsequent complications early in the course can help optimize treatments and improve outcomes. However, models based on clinical criteria alone are not accurate and/or do not validate. We hypothesized that inflammatory mediators from the stool would be biomarkers for severity and complications.

Methods. Subjects were included after testing positive for toxigenic *C. difficile* by the clinical microbiology laboratory via enzyme immunoassay (EIA) for glutamate dehydrogenase and toxins A/B, with reflex to *tcdB* gene PCR for discordants. Stool was thawed on ice, diluted 1:1 with PBS and protease inhibitor, centrifuged, and the supernatant was analyzed by a custom antibody-linked bead array with 17 inflammatory mediators. Measurements were normalized and log-transformed. IDSA severity was defined by serum white blood cell count > 15000 cells/μL or creatinine 1.5-fold above baseline. Primary 30-day outcomes were all-cause mortality and attributable disease-related complications (DRC): ICU admission, colectomy, and/or death. Analyses included principal components, permutational multivariate ANOVA (PERMANOVA), and logistic regression ± L1 regularization and 5-fold cross validation. The area under the receiver operator characteristic curve (AuROC) was computed.

Results. We included 225 subjects, with 124 females (55.1%), average age 58.5 (±17), and more PCR+ than toxin EIA+ (170 vs. 55, respectively). IDSA severity, death, and DRCs occurred in 79 (35.1%), 14 (6.2%), and 12 (5.3%) subjects, respectively. PCA and PERMANOVA showed IDSA severity ($P = 0.009$) but not death or DRCs associated with the panel (figure). Several inflammatory mediators associated with IDSA severity and death (table). Machine learning models had AuROCs of 0.77 (IDSA severity), 0.84 (death), and 0.7 (DRCs).

Conclusion. We found that specific inflammatory mediators from the stool of patients with CDI associate with severity and complications. These results are promising, but need replication in a larger dataset and should be incorporated into models that include clinical covariates prior to deployment.



Inflammatory Mediator	IDSA		Death		DRC	
	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value
CXCL5	1.20 (-0.02-0.39)	0.072	1.00 (-0.38-0.33)	0.997	0.97 (-0.42-0.37)	0.973
IL-8	1.16 (0.03-0.28)	0.018	0.98 (-0.26-0.18	0.818	0.95 (-0.32-0.18)	0.707
HGF	1.28 (0.08-0.42)	0.005	1.17 (-0.12-0.43)	0.240	1.17 (-0.16-0.45)	0.318
EGF	0.88 (-0.39-0.11)	0.319	0.4 (-1.99-(-0.20))	0.040	0.63 (-1.30-0.11)	0.199

Disclosures. **All authors:** No reported disclosures.

2237. Early Discontinuation of Antibacterials Is Safe for Patients with Community-Acquired Pneumonia (CAP) Who Have a Positive Viral Test, Negative Tests for Bacteria, and Low Procalcitonin

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Background. Studies using molecular testing methods have found monomicrobial infection with a virus as the etiology of CAP in adult patients admitted to the hospital in 6–30% of cases. The use of antibacterial agents in such patients is unnecessary, and can lead to untoward consequences. A test confirming a viral etiology may reduce the needless use of antibiotics, especially if the procalcitonin (PCT) level is low, suggesting that bacterial co-infection is unlikely. Our Antimicrobial Stewardship Program (ASP) routinely follows patients admitted with respiratory tract infections, and provides recommendations for appropriate therapy based on diagnostic test results as well as PCT levels. We present a retrospective evaluation of our experience.

Methods. A retrospective review of ASP interventions on patients admitted to Summa Health System—Akron Campus was performed for the time frame of January 2018–March 2019. Patients were included if they had a positive viral PCR result (VERIGENE™, BioFire™), a PCT level <0.25 ng/mL (BioMérieux™, Abbott™), negative bacterial studies, and an accepted intervention to discontinue antimicrobial therapy made by the ASP.

Results. The ASP assessed 131 patients with positive viral PCR studies and low PCT levels who had antimicrobials discontinued based on ASP recommendations; 68 with CAP and 63 without pneumonia (WPNA) as demonstrated on imaging. Most patients in the WPNA category had acute exacerbation of COPD. Common viruses identified were Influenza A or B, Rhinovirus and RSV. Mean duration of antibiotics was 2.6 days for CAP and 2.4 days for WPNA (Table 1). The 30-day readmission rate was similar for each group, and for CAP patients was similar for all-cause pneumonia patients at our institution (14% during similar time period). 30-day Mortality of CAP patients was low.

Conclusion. While national guidelines recommend a minimum of 5 days of antimicrobial therapy for CAP patients, we have observed that discontinuing antibiotics well before that is safe if a viral etiology is identified without evidence of bacterial co-infection (including low PCT) and results in less antibiotic usage. Reduction in unnecessary antibiotic use has the potential to improve the quality of care for adults with CAP.

Table 1: Results

	CAP (n=68)	WPNA (n=63)	p-value
Age: Mean (range)/% ≥ 65 years	74 (40-99) / 73.5%	67 (24-94) / 52.3%	0.007
Gender: % Females	63.2%	60.3%	0.87
PCT (ng/mL): Mean / % < 0.1	0.07 / 77.9%	0.07 / 79.4%	0.91
Antibiotic Days: Mean (Range) / Median	2.6 (1-8) / 2	2.4 (1-6) / 2	0.27
30 Day Readmission	13.2%	11.1%	0.92
30 Day Mortality	4.4%	1.6%	0.67

Disclosures. **All authors:** No reported disclosures.

2238. Evaluation of Adjuvant Interferon-Gamma-Level Assessment to Improve the Performance of Procalcitonin Testing in Hospitalized Bacteremic Patients

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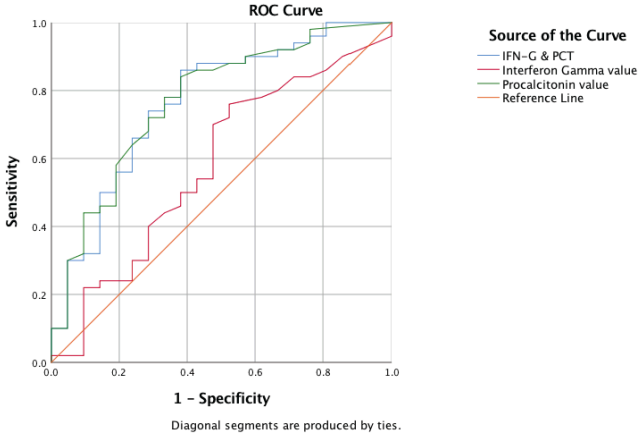
Background. Although procalcitonin-guided antimicrobial stewardship has had proven utility in emergency and ICU settings, it is still not widely adopted outside these areas. One limitation to a more universal uptake has been the unreliable performance in discriminating bacterial infected from uninfected individuals. Viral infections have been noted to suppress procalcitonin (PCT) levels through Interferon-gamma (IFN-G)-mediated inhibition of procalcitonin release from parenchymal cells. Unfortunately, clinical application algorithms do not assess INF-G levels at the time evaluation thus treating providers are unable to distinguish a true-negative test from a false-negative test resulting from INF-G-mediated procalcitonin suppression This undermines the performance of PCT, particularly in patients with bacterial and viral co-infections. We hypothesized that adjuvant interferon gamma testing could improve the performance of PCT. To test this hypothesis we prospectively enrolled bacteremic hospitalized patients along with culture-negative controls and then assessed the performance of PCT with adjuvant IFN-G testing.

Methods. 69 hospitalized patients with bacteremia and 32 culture-negative controls were enrolled. Demographic and clinical parameters were compared between groups alongside INFG and PCT levels Parametric and non-parametric statistical tests were performed where appropriate. Test performance was evaluated by constructing receiver operator curves (ROCs) for PCT, INF-G, and a combination of PCT+INF-G.

Results. Of 101 patients enrolled, the mean age was 49.46 ± 13.6 years with 47% being female. The following were comparative statistics between the culture-positive vs. culture-negative group: mean age 52.1 ± 15.7 vs. 46.4 ± 14.2 years, $P = 0.56$; WBC 11.9 ± 9.5 vs. 9.5±5.1, $P = 0.170$; ANC 8,466 ± 5,686 vs. 8,189 ± 4,769, $P = 0.907$; eGFR 73.2 ± 23 vs. 74.5 ± 26.1, $P = 0.644$; PCT 2.79 ± 5.87 vs. 0.71 ± 1.79, $P = 0.03$. Of these 57 patients had INF-G and PCT values available and their corresponding ROCs are shown in figure.

Conclusion. Our interim results indicate adjuvant INF-G testing may not improve the performance of procalcitonin in hospitalized bacteremic patients. The additional samples are being analyzed to confirm these findings.



Disclosures. **All authors:** No reported disclosures.

2239. Randomized Controlled Trial of a PROcalcitonin-Guided Antibiotic Treatment Algorithm Plus Antibiotic Stewardship the Pediatric Intensive Care Unit (ProPICU)

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Background. Procalcitonin (PCT) testing enables earlier antibiotic (abx) de-escalation in adult intensive care units (ICUs); similar data in children are lacking.

Methods. Single-center pragmatic randomized controlled trial of children admitted to the pediatric ICU and started on intravenous (IV) abx February 2018–April 2019 to evaluate whether a PCT-guided testing and treatment algorithm implemented through antibiotic stewardship (AS) audit and feedback promotes abx de-escalation in the pediatric ICU. Patients were randomized by month to either control or PCT arm. Exclusion criteria were receipt of IV abx within 7 days prior to enrollment, immune compromise, neonates < 34 weeks gestation, or receipt of abx for an infection requiring prolonged abx. All subjects had baseline AS review. Subjects in the PCT arm had PCT testing on days 0, 1, 2, and 4 and AS guidance. Some subjects in the control arm had baseline PCT testing that was not available to providers. Abx de-escalation = stopping or narrowing spectrum of abx; Abx escalation = broadening spectrum or starting an additional abx. The primary outcome was abx days of therapy (DOT) per patient in the first 14 days after enrollment. Kruskal–Wallis, Chi-square, and ANOVA tests were used.

Results. The modified intention to treat analysis included 270 patients: 133 control and 137 PCT. Significantly more males and febrile patients were in the PCT-guided arm (Table 1). Overall, abx DOT did not differ between arms (Table 2). In 85 patients with pneumonia, median DOT per patient was shorter in the PCT than control arm (8.0 vs. 9.3 days, $P = 0.04$). Among patients in the PCT arm, those with initial PCT level > 0.5 mg/L ($n = 93$) (4.3 vs. 7.1 days, $P = 0.006$). More AS recommendations (recs) were made in the PCT arm (53 PCT vs. 35 control, $P = 0.03$). Compliance with AS recs was similar (70%) between arms.

Conclusion. In the pediatric ICU, the use of a PCT testing and treatment algorithm with AS audit and feedback resulted in shorter abx DOT for patients with pneumonia and more AS recs compared with no PCT testing. PCT testing implemented with AS can reduce abx duration in select populations of critically ill children.

Table 1. Baseline characteristics

	PCT-guided arm (n = 137)	Control arm (n = 133)	*p*-value
Age (years) (median, IQR)	2.3 (0.4, 8.8)	1.6 (0.5, 8.3)	0.54
Males (n, %)	80 (58%)	60 (45%)	**0.03**
Pressor support (n, %)	33 (24%)	27 (20%)	0.47
Mechanical ventilation (n, %)	61 (45%)	45 (34%)	0.07
Fever (n, %)	79 (58%)	61(46%)	**0.05**
Baseline PCT level (μg/L) (median, IQR)	0.9 (0.2, 3.4) (n=111)	0.8 (0.3, 4.6) (n=62)	0.81