ORAL ABSTRACT

109. Differences in Gram-Negative Antibiotic Susceptibility Among Patients Receiving Fecal Microbiota Transplant for *Clostridioides difficile*

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Background. Decreases in multidrug-resistant organism (MDRO) colonization and antibiotic resistance gene abundance have been reported after fecal microbiota transplantation (FMT), but data on clinical microbiology culture and susceptibility results after FMT are limited.

Methods. We retrospectively reviewed the available microbiology results for patients who underwent FMT for recurrent *Clostridioides difficile* infection (RCDI) at Emory University from July 7, 2012 until December 2017 and had microbiology results within 1 year pre- and post-FMT. Demographic and clinical characteristics were abstracted by trained reviewers, and statistical tests of differences in central tendency were tested with Wilcoxon signed-rank tests.

Results. Of 236 unique patients undergoing FMT during the study period, 18 had growth of Gram-negative bacteria on culture pre- and post-FMT. Of these, 8 had Gram-negative growth in urine culture (the most common site) pre- and post-FMT. Fourteen (14/18, 78%) patients were female, 4/18 (22%) were black, 14/22 (78%) were white, and 18/18 (100%) were non-Hispanic. The mean number of CDI episodes prior to first FMT was 4 (range 3–7 episodes). Differences in counts of susceptible, intermediate, and resistant susceptibility test results before and after FMT are shown in Figures 1 and 2. Although a trend in reduction of resistant reports is visually suggested, this was not statistically significant by Wilcoxon signed-rank testing ($P = 0.10$ for all cultures, $P = 0.21$ for urine). Ten patients had pre-FMT micro results and no micro results after FMT, but reduction of count of infectious syndromes in FMT could not be tested with this study design. Abstraction of viral quantitative PCR results did not suggest clinical recognition of new infection or reactivation of viruses after FMT.

Conclusion. FMT may reduce clinical burden of antimicrobial resistance, but statistically significant differences in resistance were not detected in this study. Further study with RCTs is needed.

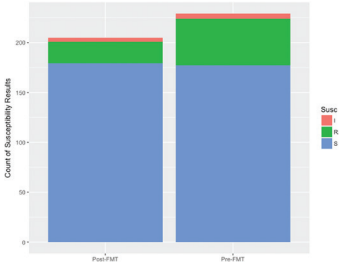

Figure 1: Gram-negative culture results from all sites within 1-year pre- and post-FMT, 2012–2017.

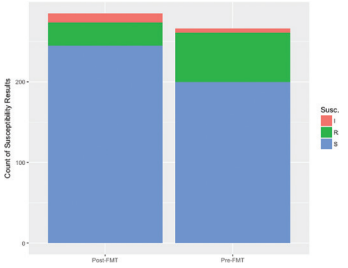

Figure 2: Gram-negative urine culture results within 1-year pre- and post-FMT, 2012–2017.

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110. The Burden and Preventability of Sepsis-Associated Mortality in 6 US Acute Care Hospitals

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Background. Sepsis is considered a leading cause of preventable death, but the actual burden of sepsis mortality is difficult to measure using administrative data or death certificates. We analyzed the prevalence, underlying causes, and preventability of deaths due to sepsis in acute care hospitals using detailed medical record reviews.

Methods. We randomly selected 577 adult patients who died in-hospital or were discharged to hospice in 2014–2015 at 6 US academic and community hospitals for medical record review. Cases were reviewed by experienced clinicians for sepsis during hospitalization (using Sepsis-3 criteria), terminal conditions on admission (defined using hospice-qualifying criteria), immediate and underlying causes of death, and suboptimal sepsis care (delays in antibiotics, inappropriate antibiotic therapy, inadequate source control, or other medical errors). The overall preventability of death was rated on a 6-point Likert scale (from definitely not preventable to definitely preventable) taking into account comorbidities, severity of illness, and quality of care.

Results. Sepsis was present in 302/577 (52%) hospitalizations ending in death or discharge to hospice and was the immediate cause of death in 199 cases (35%) (Figure 1A). Underlying causes of death in sepsis patients included solid cancer (21%) and chronic heart disease (15%), and hematologic cancer (10%) (Figure 1B). The median age of sepsis patients who died was 73 (IQR 62–84). Terminal conditions were present in 122/302 (40%) sepsis deaths, most commonly end-stage cancer (26% of cases). Suboptimal care was identified in 68 (23%) of sepsis deaths, most commonly delays in antibiotics (11% of cases). However, only 4% of sepsis deaths were definitely or likely preventable and an additional 8% were considered possibly preventable with optimal clinical care (Figures 2 and 3).

Conclusion. Our findings affirm that sepsis is the most common cause of death in hospitalized patients. Most patients that died with sepsis were elderly with severe comorbidities, but up to 1 in 8 sepsis deaths were felt to be potentially preventable with better hospital-based care. These findings may inform resource allocation and expectations surrounding the impact of hospital-based sepsis treatment initiatives.

Figure 1. Immediate and Underlying Causes of Death

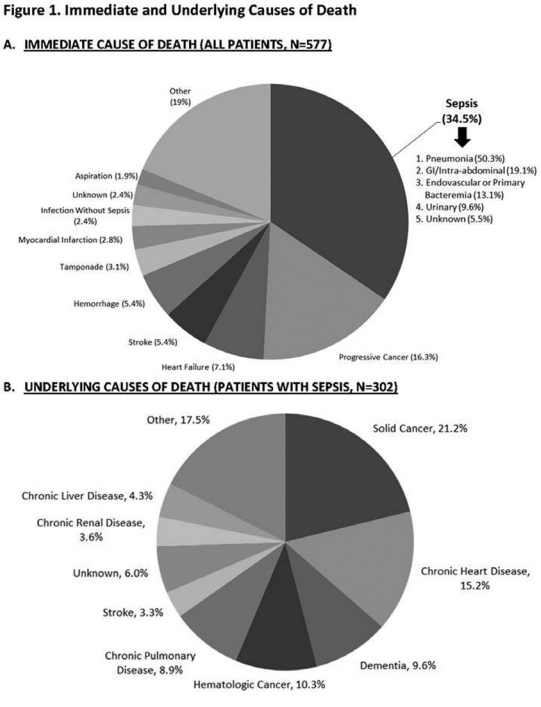
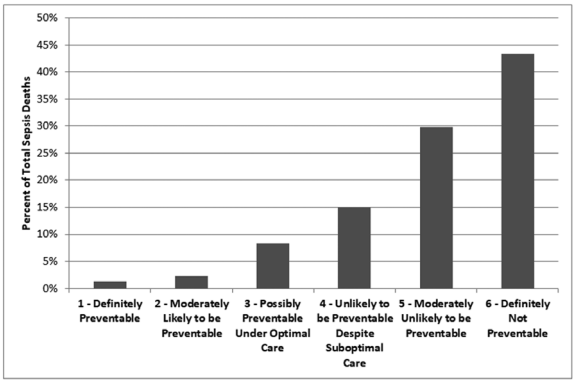


Figure 2. Distribution of Preventability Ratings for Sepsis Patients that Died or were Discharged to Hospice



The cohort included 302 patients with sepsis.

Figure 3. Representative Sample of Potentially Preventable vs Non-Preventable Sepsis Deaths

Case Summary (including major comorbidities)	Underlying Cause of Death	Reasons Why Preventable or Not Preventable
Definitely (1) or Moderately Likely (2) to be Preventable*		
89F in relatively good health admitted for hyponatremia secondary to syndrome of inappropriate antidiuretic hormone secretion. On hospital day 4, developed fevers and found to have methicillin-sensitive *Staphylococcus aureus* bacteremia secondary to peripheral intravenous line infiltration and septic thrombophlebitis. Despite operative thrombus excision, developed sepsis, respiratory failure, and cerebral septic emboli. Transitioned to comfort measures and expired.	Septic thrombo-phlebitis	Hospital-acquired vascular infection, delay in antibiotics (only started when blood cultures turned positive; could have been started empirically based on fevers).
71F with chronic obstructive pulmonary disease, diabetes, coronary artery disease, and gastric cancer in remission after gastrectomy, presented with constipation and high-grade small bowel obstruction. Afebrile but hypotensive with 24% bands and elevated lactate. No antibiotics given. Admitted to surgical ward with conservative management. Next morning, had worsening abdominal pain, bandemia, lactic acidosis, and oliguria. Taken to operating room in late afternoon. No antibiotics given until surgery. Found to have necrotic bowel that was resected. Post-operatively, had septic shock physiology and ultimately made comfort care and expired. No recurrent gastric cancer on autopsy.	Gastric cancer	Delay in antibiotics and source control (earlier operative management prior to bowel infarction could have prevented sepsis).
Potentially Preventable (3)*		
57M with lymphoma s/p hematopoietic stem cell transplant admitted with *Clostridium difficile* diarrhea. Developed worsening respiratory distress of unclear cause. Treated with standard pneumonia antibiotics. Ultimately diagnosed with *Pneumocystis jirovecii* pneumonia based on chest CT findings and elevated beta-D-glucan, but not treated empirically for this for the first several days. Expired from respiratory failure and sepsis.	Lymphoma	Delay in appropriate antibiotics (no anti-Pneumocystis therapy). Rated potentially preventable instead of definite because of atypical pathogen which many clinicians may not initially treat for in this setting.
Unlikely to be Preventable (even though some circumstances and clinical care may not have been optimal) (4)*		
81F with no past medical history, presented with 2 weeks of abdominal pain and change in stool caliber. White blood cell count 29,000 on admission. Abdominal CT scan showed large obstructing colonic tumor with external invasion and contained perforation, with metastatic disease and peritoneal carcinomatosis. Started on fluids, antibiotics and admitted to surgical service with plan for surgerynext morning. Overnight, developed hypotension and intra-abdominal free air on chest radiograph. Taken emergently for surgery and found to have diffuse stool spillage in abdomen. Developed septic shock and multiorgan failure postoperatively. Family decided on comfort measures and patient expired.	Colon cancer	Ideally, patient would have gone to surgery immediately on presentation, prior to perforation. However, decision to perform surgery in morning was not unreasonable at the time, and prognosis was poor given the extent of her cancer.
Moderately (5) or Definitely (6) Unlikely to be Preventable*		
57M with alcohol abuse and smoking history, presented with back pain, leg weakness, incontinence, hemoptysis, and falls. Severely hypoxemic on arrival requiring immediate intubation. Subsequently hypotensive requiring vasopressors. Computed tomography showed large right-sided pleural effusion with underlying lung mass and likely liver metastases. Chest tube placed with frank pus. Bronchoscopy showed large mass obstructing right mainstem bronchus. Suffered cardiac arrest (pulseless electrical activity) shortly after admission, resuscitated but required 3 vasopressors and had multi-organ failure. Transitioned to comfort care and expired.	Lung cancer (newly diagnosed)	Severely ill on arrival to hospital and underlying metastatic lung cancer causing bronchus obstruction. Unlikely to have survived under any circumstances.
78M with refractory acute myelogenous leukemia (treated with multiple chemotherapy regimens), presented with fevers, cough, hypotension, and multifocal pneumonia. Despite timely broad spectrum antibiotics, developed worsening delirium and multiorgan failure, with 90% blasts on peripheral smear. Initiated on palliative hydroxyurea but goals of care changed to comfort measures. Discharged to hospice and expired shortly after.	Acute myelo-genous leukemia	Had sepsis from pneumonia on arrival but main underlying problem was progressive, incurable leukemia.

***The numbers 1-6 correspond to the Likert scale used by clinician reviewers**

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

111. Increasing Duration of Surgical Prophylaxis Increases Antimicrobial-Associated Adverse Events but Does Not Decrease Surgical Site Infections: An Opportunity for Stewardship

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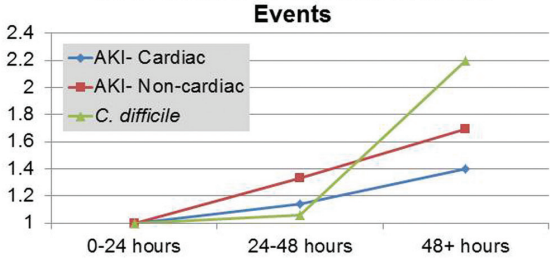
Background. The benefits of surgical antimicrobial prophylaxis are limited to the first 24 hours postoperatively. However, little is known about the harms associated with prophylaxis lasting for greater than 24 hours. Thus, we sought to characterize the relationship between duration of prophylaxis and key post-operative outcomes, including surgical site infections (SSI), acute kidney injuries (AKI), and *C. difficile* infections (CDI) using a large, multi-center national cohort.

Methods. All patients who underwent cardiac, orthopedic total joint, vascular, and colorectal procedures and who received planned manual review by a trained nurse reviewer for type and duration of surgical prophylaxis and for SSI within the national VA healthcare system during the period from FY08 to FY13 were included. The primary exposure variable of interest was duration of postoperative prophylaxis (<24 hours, 24–48 hours, and 48+ hours). Outcomes evaluated included SSI, AKI, and CDI. ORs were calculated using log binomial regression models adjusted for known risk factors for each clinical syndrome selected a priori.

Results. Out of a total cohort of 79,092, all patients had SSI and *C. difficile* outcomes available and 67,729 patients had AKI outcome available. After stratification by type of surgery and adjusting for age, sex, race, diabetes, smoking, pre-operative MRSA colonization status, mupirocin receipt, and type of prophylaxis, there was no significant association between SSI and duration of prophylaxis; longer durations did not lead to additional SSI reduction. Odds of AKI increased with each additional day of prophylaxis among cardiac and noncardiac surgeries. Similarly, the odds of *C. difficile* increased with each additional day of prophylaxis across all types of surgery ($P < 0.01$) (see figure).

Conclusion. Increasing duration of postoperative antimicrobial prophylaxis is associated with higher odds of AKI and *C. difficile* infection in a dose-dependent manner. Additional days of prophylaxis are not associated with reduced odds of SSI. These findings suggest that stewardship efforts to limit duration have the potential to reduce antimicrobial-associated adverse events without leading to increases in SSI.

Figure 1. Relationship Between Duration of Surgical Prophylaxis and Risk of Antimicrobial-Associated Adverse Events



Disclosures. **K. Itani**, sanofi: Grant Investigator, Grant recipient. Pfizer: Grant Investigator, Grant recipient.

112. Sick Employee Online Log System for Tracking Employee Illnesses During the 2017–2018 Influenza Season Provided Real-Time Surveillance and Early Detection of Influenza-Like Illnesses Among Employees

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Background. Vidant Health is an 8-hospital, 1,542-bed system (including the 908-bed teaching hospital for The Brody School of Medicine at East Carolina University) with over 12,000 employees, and uses a sick employee online log (SEOL) to track illnesses among employees. Influenza-like illness (ILI) surveillance is collected from sentinel sites across the state of North Carolina (NC) by the Department of Health. Our goals were to determine the utility of the SEOL to monitor ILI among employees and to compare trends with the NC ILI-system for Influenza surveillance.

Methods. When an employee calls in sick, symptoms for ILI in both the SEOL system and NC ILI-system include fever plus cough and/or sore throat. SEOL is an internet-based system, so information is collected and analyzed in real time. The number of sick hospital employees with influenza-like illness (ILI) per week during the 2017–2018 Influenza season was compared both to those employees reporting "Flu" and to the NC ILI numbers from the sentinel sites using MS Excel.

Results. The data analyzed was from October 2017 to April 2018. First, while lesser actual numbers of sick employees reported "Flu," there was a correlation value of 0.93 between those reporting "Flu" and those reporting ILI symptoms (see Figure 1). Secondly, the SEOL results are available daily, while the NC ILI data are reported 7–12 days from entry; however, the peaks in ILI paralleled those of the peaks in SEOL data for employees reporting symptoms of ILI (see Figure 2) with a correlation value of 0.79 between the two. Finally, there were no breaks in confidentiality for those employees utilizing the SEOL.

Conclusion. The SEOL provided a real-time tool to monitor employee illnesses due to ILI during influenza season, and without the lag time of the ILI-surveillance by the state. This system maintained confidentiality with a convenient method for data entry. These findings conclude that the SEOL system data correlated positively with the state ILI data and provided an early detection system for the appearance of influenza among our employees.

Figure 1. Number of Employees with Influenza-like illnesses (ILI) Compared to Weekly Number of Employees Self Reporting Influenza in SEOL, Oct. 2017 to Apr. 2018, $r = 0.93$