Methods. We conducted a national retrospective study of Veterans with a first CDI between 2010 and 2014, defined as a positive C. difficile toxin(s) and no episode of postoperative antibacterial prophylaxis. We performed a retrospective cohort study including all patients aged ≥18 years who underwent orthopedic surgery from January 2016 through December 2017 in a tertiary care hospital in Seoul, South Korea.

Results. Of the 9,517 patients included in the study cohort, mean age was 65.3 years (±SD 14.6), 92.5% (n = 8,802) were male, and 75.03% (n = 7,141) were white. Half were exposed to non-CDI antibiotics during CDI treatment (51.8%, n = 4,924) and 8.9% (n = 849) died. In unadjusted and adjusted analyses, concomitant antibiotic use was associated with death (HR 5.74, 95% CI 4.75–6.93; aHR 2.39, 95% CI 2.07–2.75). Advanced generation cephalosporin (aHR 1.95, 95% CI 1.26–3.02), and clindamycin (aHR 1.95, 95% CI 1.26–3.02) were associated with death, while fluoroquinolone use was not (aHR 0.97, 95% CI 0.84–1.12).

Conclusion. Among our national cohort, concomitant antibiotic use was common during the prevalence, any concomitant antibiotic increased the risk of death; however, results suggest risk might vary by antibiotic class. Results support continued efforts in the reduction of unnecessary antibiotic use during CDI treatment, and future studies into which antibiotics may have the least risk of death when treatment is necessary.

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471. Prevalence and Characteristics of Clostridiods difficile Infection in Bangladesh
Amelia K. Sofian, PharmD2; M. Iahump Alam, PhD3; M. Amirul Islam, PhD3; and Kevin W. Garey, PharmD, MS5; University of Houston College of Pharmacy, Houston, Texas, 1The International Centre for Diarrhoeal Disease Research, Dhaka, Bangladesh, 2Pitt University, University of Houston College of Pharmacy, Houston, Texas

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Background. The estimated prevalence of C. difficile infection (CDI) in several South Asian countries is 10.5%, similar to that in North America and Europe. However, the epidemiology of CDI in Bangladesh is unknown. We aimed to assess the prevalence of CDI and assess hospital environmental contamination of toxigenic C. difficile in Bangladesh.

Methods. This was a prospective observational cohort study at two large tertiary care centers in Dhaka, Bangladesh, conducted from January 2017 to December 2017. Stool samples were collected from hospitalized adults with diarrhea (≥3 loose stools in 24-hour period) and antimicrobial exposure within the past 30 days. Hospital environmental samples were collected by swabbing surfaces of common areas in the hospital during CDI treatment. Any concomitant antibiotic use increased the risk of death; however, results suggest risk might vary by antibiotic class. Results support continued efforts in the reduction of unnecessary antibiotic use during CDI treatment, and future studies into which antibiotics may have the least risk of death when treatment is necessary.

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472. Prevalence, Risk Factors, and Outcome of Postoperative Clostridiods difficile Infection After Orthopedic Surgery
Dong Youn Kim, MD2; Yu-Mi Lee, MD,1; Young Jin Kim, MD,1; Misuk Lee, MD2; Hee-Joo Lee, MD2; and Ki-Ho Park, MD1; 1Division of Infectious Diseases, Department of Internal Medicine, Kyung Hee University Hospital, Kyung Hee University School of Medicine, Seoul, Korea, Republic of (South), 2Department of Laboratory Medicine, Kyung Hee University Hospital, Kyung Hee University School of Medicine, Seoul, Korea, Republic of (South)

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Background. The patients undergoing orthopedic surgery may have many risk factors of C. difficile infection (CDI), including increased age, multiple comorbidities, the use of concomitant antibiotics, and prolonged length of stay. The aim of this study was to identify prevalence, risk factor, and outcome of postoperative CDI in patients who underwent orthopedic surgery.

Methods. We performed a retrospective cohort study including all patients aged ≥18 years who underwent orthopedic surgery from January 2016 through December 2017 in a tertiary care hospital in Seoul, South Korea.

Results. During the study period, 7,369 episodes of orthopedic surgery were identified. The prevalence of C. difficile infection was 7.7 cases per 1,000 surgical procedures (95% confidence interval, 6.0–10.0). The risk of CDI was the highest among patients who underwent spine surgery (33.8 cases per 1,000 surgical procedures), followed by hip/femur surgery (12.4, knee (3.8), and extremity (3.2). The risk of CDI increased according to the increase in duration of proton pump inhibitor: 0.1% (no use), 0.3% (1–7 days), and 2.7% (>7 days; P < 0.001). The independent risk factors associated with concomitant antibiotic use were age ≥65 years (OR per 1-year increase, 1.26; P < 0.001), Charlson comorbidity index score (OR per 1-point increase, 1.26; P < 0.001), duration of proton pump inhibitor (OR per 1-day increase, 1.02; P < 0.001), and operation time (OR per 1-hour increase, 1.30; P = 0.003). Of 6,724 episodes of surgical procedure for which patients received exclusive perioperative antibacterial prophylaxis, 22 episodes of postoperative CDI occurred (3.2 cases per 1,000 surgical procedures). Among this subgroup, the risk of CDI increased according to the increase in duration of antibiotic prophylaxis: 0% (<24 hour), 0.28% (1–7 days), and 1.27 (>7 days; P < 0.001). After adjusting confounding factors, duration of perioperative antibacterial prophylaxis significantly affected the risk of postoperative CDI (OR per 1-day increase, 1.11; P < 0.001). Patients with CDI had a higher rate of postoperative mortality (10.5% vs. 0.6%; P < 0.001) and an increased length of hospital stay (mean 42 vs. 10 days; P < 0.001).

Conclusion. Judicious use of proton pump inhibitor and avoiding of extension of prophylactic antibiotics can reduce postoperative CDI after orthopedic surgery.

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473. Molecular Typing of Clostridiods difficile: Concordance Between PCR-Ribotyping and Multilocus Sequence Typing (MLST)
Xiang Wang, DVM, PhD2; Stacy Holzhauer, DVM, MPH1; Kelly Pung, BS1; Marra Bye, MPH1; Michelle Adanczyk, BS1; Ashley Lyn Paulik, BS2; Nicholas Vlachos, MS1; Alice Guh, MD, MPH1; Alison S. Laufer-Halpin, PhD2; Maria S. Karlsson, PhD2; Dave Boxrud, MSC3; and the Emerging Infections Program CDI Workgroup; 1Minnesota Department of Health, Saint Paul, Minnesota, 2Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia

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Background. C. difficile infection (CDI) incidence has increased dramatically in the past decade, making CDI one of the most common causes of infectious diarrhea and an urgent public health threat. Understanding the biological features and clinical presentation of C. difficile strains can help target control efforts. PCR-ribotyping, the current method of choice for C. difficile typing, remains subjective and challenging for inter-laboratory comparisons. Multilocus sequence typing (MLST), based on the alleles of seven housekeeping genes, represents a more robust tool that would enhance inter-laboratory reproducibility. However, a comprehensive translation system to ribotyping is imprerequisite. Here, we describe the concordance between MLST and PCR-ribotyping.

Methods. The Centers for Disease Control and Prevention’s (CDC) Emerging Infections Program (EIP) conducts CDI surveillance in 10 US sites. C. difficile isolates cultured from a subset of cases underwent capillary-based PCR-ribotyping at CDC. A representative sample, selected from the top 30 ribotypes (RTs), underwent whole genome sequencing (WGS) at Minnesota Department of Health. An additional subset of isolates, representing the top 10 RTs, underwent WGS at CDC. At both laboratories, the Illumina MiSeq platform was used to obtain 250 base-paired-end sequencing reads. MLST analyses were done using PubMLST C. difficile MLST database.

Results. A total of 479 C. difficile isolates, including at least 10 isolates for each RT, were analyzed by WGS. Among the 30 RTs represented, 35 different MLST sequence types (STs) were identified. Twenty-two of the RTs (including 027) were each associated with a single unique ST, while 8 RTs (001, 012, 015, 026, 030, 035, 055, and 075) presented more genetic diversity with single-locus or double-locus variants, resulting in multiple STs within one ribotype. There were two instances of two different RTs sharing the same ST.

Multilocus sequence typing and PCR-Ribotyping showed comparable discriminatory abilities. However, the ST is not always predictive of the RT and vice versa. This represents the first step toward a transition to using WGS for standard C. difficile typing.

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