316. Joint Initiative Between Infectious Diseases and Podiatry in Outpatient Settings Improves Diabetic Foot Infection Patients’ Compliance and Outcomes
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Background. Many patients with diabetic foot infections (DFI) face challenges with keeping their follow-up appointments. This can result in recurrent DFI. A joint, Infectious Diseases-Podiatry clinic (JIDPC) that an Infectious Diseases (ID) physician and a Pediatrist see their patients together in wound care center once a week was initiated in January 2017. This study was designed to investigate if JIDPC can improve patient compliance and outcomes.

Methods. A retrospective analysis of the patients admitted to Wheeling Hospital with DFI from March 2013 to December 2017 and required post discharge follow-up by ID and Podiatry was performed. Initially, they were followed by ID and Podiatry in their clinics separately (preintervention group). Beginning January 2017, they were followed together at the JIDPC (postintervention group). Recurrent infection, mortality, and lost to follow-up were compared between the two groups using logistic regression models adjusting for age and sex.

Results. Among 119 patients, 85 patients were in preintervention group and 34 patients were in postintervention group. Surgeries were performed in 47.1% of preintervention group and 85.3% of postintervention group (P < 0.001). Risk of recurrence in 6 months was significantly higher in preintervention group (odds ratio [OR] = 3.14 [1.07–9.24]), but with further adjustment for surgery, P-value was 0.05 (OR = 3.08 [0.98–9.62]). Preintervention group was more likely to be lost to follow-up (OR = 3.67 [1.16–11.59]), but the association was attenuated with further adjustment for surgery (OR = 2.17 [0.64–7.41]). Re-admission in 90 days and mortality rate were not significantly different.

Conclusion. Implementation of JIDPC would be effective to decrease the incidence of recurrent infections among DFI.

Table 1: Clinical Characteristics and Comparison Between Pre- and Postintervention Groups

| Characteristic | Preintervention Group (n = 85) | Postintervention Group (n = 34) | P-Value |
|---------------|-------------------------------|-------------------------------|---------|
| Male sex 66   | 77.7                          | 26.6                          | 0.890   |
| Age ≤65 30   | 26.0                          | 17.7                          | 0.138   |
| Osteomyelitis 66 | 77.7                     | 28.2                          | 0.569   |
| Surgery 40 | 47.1                          | 29.5                          | 0.307   |
| Peripheral vascular disease 29 | 33.0               | 11.8                          | 0.859   |
| Kidney dysfunction 34 | 40.0                  | 12.2                          | 0.634   |
| Poorly controlled diabetes 37 | 43.5              | 14.1                          | 0.315   |
| Lost follow-up 27 | 31.8           | 4.8                           | 0.025   |
| Re-admission 27 | 31.8                      | 12.2                          | 0.377   |
| Death 12 | 4.7                           | 5.9                           | 1.000   |
| Recurrence in 6 months 31 | 36.5            | 5.8                           | 0.044   |

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317. Risk Factors for Fungal Prosthetic Joint Infections (PJs)
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Background. Fungal PJs are rare and often associated with poor outcome. Risk factors are not well described and thus, we sought to determine such risks among patients cared for at two large academic hospitals.

Methods. This was a retrospective case-control study among patients with PJ from 2006 to 2016. Each fungal PJ case was matched 1:1 with a bacterial PJ control for joint location (hip, knee, and shoulder) and year of diagnosis. We compared demographics (age, sex, and race), co-morbid conditions (BMI, diabetes, immunosuppression, renal disease, and antibiotic use), and clinical characteristics (organism, joint age, wound factors, laboratory data, previous joint surgeries, and previous PJ) between fungal and bacterial PJ groups using chi square/Fisher’s exact or Wilconon rank-sum test. Risk factors statistically (P < 0.05) or clinically significant were included in a multivariable logistic regression (MVR) model in stepwise fashion (SAS 9.4, Cary, North Carolina).

Results. Forty-one fungal PJ occurred over the study period and 61% were due to Candida albicans. Median age was 64.7 years, 51% were females, and 87% were White. The hip was involved in 51.2%, followed by the knee (46.3%), and shoulder (2.4%). There were no significant differences in joint age or co-morbid conditions. Compared with bacterial PJ, those with fungal PJ were more likely to have received antibiotics within the past 3 months (70.7% vs. 34%, P = 0.001), had wound drainage lasting more than 5 days (48% vs. 9%, P = 0.0002), had a lower median CRP (2.95 mg/dL vs. 5.99, P = 0.013) and received antibiotics within the past 3 months (31 patients vs. 11 patients, P = 0.039). A higher proportion of prior two-stage exchanges (82.9% vs. 53.6%, P = 0.008). After MVR, controlling for the center, presence of wound drainage for more than 5 days (OR, 7.3; 95% confidence interval [CI], 2.02–26.95) and receipt of antibiotics within the past 3 months (OR, 3.4; 95% CI, 1.2–9.3) were factors significantly associated with fungal PJ.

Conclusion. In our study, Candida albicans was the most common species in fungal PJs. The presence of wound drainage for more than 5 days and receipt of antibiotics within the past 3 months were independent risk factors for fungal PJ among a cohort of PJ patients.

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318. Treatment Outcomes of Prosthetic Joint Infections: An Internal Assessment of Adherence to Best Practice Guidelines
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Background. The impact of prosthetic joint infections (PJI) on patient outcomes and health systems is extensive. Patients with PJI may receive nonpreferred antibiotic therapy due to ease of administration, cost, and drug interaction profile. Our objective was to compare treatment of PJI to internal guideline-recommended therapy and assess treatment outcomes.

Methods. To reduce heterogeneity of PJI treatment within a large, integrated health system, our antimicrobial stewardship program and orthopedic surgeons created an internal best-practice guideline for treatment of PJI based on published literature. The guideline considers organism and surgery specific (Figure 1). Patients who had total knee arthroplasty (TKA) or total hip arthroplasty (THA) and subsequently developed PJI from July 2016 to June 2017 were identified retrospectively. Recurrent infections were defined as recurrence of primary infections or new infections with other organisms. Rates between patients treated with guideline-concordant and guideline-discordant regimens were compared.

Results. Among 36 TKAs complicated by PJ, fewer patients who received guideline-concordant therapy experienced recurrent infection than patients who received guideline-discordant therapy (1 of 16 patients [6.3%] vs. nine of 20 patients [45%]; P = 0.0219). Among 25 THAs complicated by PJ, there was a trend toward fewer recurrent infections when patients received guideline-concordant therapy (2 of 12 patients [16.7%] vs. 5 of 11 patients [45.5%]; P = 0.1775). Common deviations from the guidelines included daptomycin use for methicillin-resistant Staphylococcus spp. with implant retention due to ease of administration in outpatient settings and avoidance of rifampin due to tolerability or drug interactions.

Conclusion. Deviation from treatment guidelines for PJI following TKA and THA may increase the risk of recurrent infection. Barriers to utilizing guideline-recommended antibiotics in the outpatient setting should be addressed. Institutions should develop internal consensus on PJI treatment with prospective surveillance.

Figure 1. Treatment recommendations for Staphylococcus spp. After Debridement and Implant Retention (DAIR)—one element of the comprehensive internal guideline

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319. Is Chronic Vertebral Disk Infection With Low Virulence Bacteria a Common Cause of Back Pain?
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Background. In 1998 Modic described changes in vertebral body marrow with magnetic resonance imaging, and related those changes to pathological findings in the
adjacent disc that were similar to those seen in bacterial discitis. As early as 2001 Stirling noted a relationship between sciatica and Propionibacterium acnes cultured from disc space material obtained at discectomy. In 2013 Albert demonstrated that Modic type I changes, strongly associated with low back pain, responded to 100 days of antibiotic treatment in a large randomized controlled trial. The findings were controversial, and we proposed that modern microdiscectomy techniques would minimize the potential for contamination with the common skin bacteria reported most often in previous studies.

**Methods.** We performed a prospective uncontrolled case series of patients undergoing microdiscectomy for symptomatic disc degeneration or herniation. Subjects were greater than 18 years old, nonpregnant, with chronic low back pain, and meeting standard criteria for microdiscectomy. After giving informed consent, data were extracted from existing medical records and cultures of disc material were obtained at discectomy prior to perioperative prophylactic antibiotics, and were processed by standard methodology for aerobic, anaerobic, and acid-fast bacterial growth.

**Results.** Thirty-three patients were included in the study, mean age 52.6 (SE 3.1), 19 females and 14 males. The study was terminated after these 33 cases when only one aerobic culture was positive from one male subject, and this for a minimal growth of Staphylococcus epidermidis.

**Conclusion.** If a significant fraction of chronic low back pain is indeed caused by chronic infection with low-virulence bacteria, this would be a paradigm shift in the evaluation and management of a common and often debilitating condition. In our study of patients with chronic low back pain undergoing microdiscectomy, we did not find evidence of chronic low-virulence bacterial infection.

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### 320. Variation in Use of Chronic Antibiotic Suppression (CAS) for Treatment of Staphylococcus aureus Prosthetic Joint Infection (PJI)

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**Background.** The Infectious Diseases Society of America (IDSA) guidelines observed that prescribing CAS for treatment of PJI is an unresolved issue. We aimed to characterize variation in the use of CAS while accounting for patient-level factors to identify targets for antimicrobial stewardship in the Veterans Affairs system.

**Methods.** A retrospective cohort study was conducted using data on veterans with a diagnosis of S. aureus PJI between 2003 and 2015. Patients managed with debridement, one-stage exchange (OSE), or two-stage exchange (TSE) were included. Differences in characteristics between any CAS and no CAS treatment (None) were determined by the Mann–Whitney U test for continuous variables and Fisher’s exact test for dichotomous variables. Generalized linear-mixed models were used to calculate the risk standardized measure (observed to expected (O/E) ratio) of a hospital’s CAS use.

**Results.** Nine hundred forty-four (75%), 310 (25%), and 11 (<1%) were managed with debridement, TSE, and OSE, respectively, among the 1,265 included patients. CAS was prescribed in 80% of debridement patients, 49% of TSE patients, and 100% of OSE patients. Patient factors associated with CAS use were different for debridement and TSE (Table). Risk adjusted models demonstrated greater variability among facilities using CAS after TSE compared with debridement and the overall cohort (figure).

**Conclusion.** There is substantial variation in the use of CAS by patient characteristics for S. aureus PJI across the VHA system. This variation differs between debridement and TSE surgery patients. Further research is warranted to guide CAS recommendations.

**Table:** Characteristics for Overall Cohort and by Type of Surgery

| Overall | Debridement | TSE |
|---------|-------------|-----|
| Patient factors | Site of PJI | Age (P = 0.03) | Body mass index (P = 0.008) |
| different between | | | |
| any vs. none CAS | Psychosis | Coagulopathy | Serum creatinine* |
| groups | | (P = 0.02) | (P = 0.03) |
| | Erythrocyte sedimentation rate | Obesity | (P = 0.007) |
| | (P = 0.0003) | | |
| | Serum creatinine* | Average income6 | – |
| | (P = 0.0002) | (P = 0.01) | |
| | C-reactive protein* | Severity of illness at | – |
| | (P = 0.0003) | time of PJI | |
| | White blood count | Receipt of dialysis* | (P = 0.0007) |
| | (P = 0.0002) | (P = 0.004) | |
| | Neutrophil count | – | – |
| | (P = 0.0006) | | |

*After PJI revision surgery and prior to initiation of CAS.

6Year prior to PJI.

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### 321. Assessing the Role of Daptomycin as Antibiotic Therapy for Staphylococcus Prosthetic Joint Infection

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**Background.** Optimal antibiotic therapy following surgery for prosthetic joint infection (PJI) depends on potency, toxicity, convenience, and cost. Daptomycin, a potent, convenient, and low-toxicity antibiotic, is FDA approved for the treatment of skin and soft-tissue infections, but its role in treatment of PJI is less clear. We reviewed our experience with daptomycin in the treatment of staphylococcal PJI.

**Methods.** A retrospective cohort of staphylococcal hip and knee PJI treated with daptomycin after debridement (I&D) or two-stage exchange was identified by query of hospital coding records from 2009 to 2014, with subsequent chart review. All cases met Musculoskeletal Infection Society International Consensus criteria for PJI; all staphylococcal species were included. The primary endpoint was defined in debrided joints as retention of the prosthesis at 2-year follow-up, and for two-stage exchanges, as prosthesis retention for 2 years from reimplantation. Descriptive statistics were completed using the Fisher’s exact test for categorical variables and the Mann–Whitney U test for continuous variables.

**Results.** Two hundred forty-one patients with staphylococcal PJI were identified: 148 two-stages (112 [75%] had success at 2 years) and 95 I&Ds (44 [47%] had success at 2 years). Twenty-eight (19%) two-stages and nine (10%) of debridements received daptomycin after debridement of PJI and two-stage exchange was identified by query of hospital coding records from 2009 to 2014, with subsequent chart review. All cases met Musculoskeletal Infection Society International Consensus criteria for PJI; all staphylococcal species were included. The primary endpoint was defined in debrided joints as retention of the prosthesis at 2-year follow-up, and for two-stage exchanges, as prosthesis retention for 2 years from reimplantation. Descriptive statistics were completed using the Fisher’s exact test for categorical variables and the Mann–Whitney U test for continuous variables.

**Conclusion.** Daptomycin appeared no better or worse than comparator antibiotics in a relatively large retrospective cohort of staphylococcal hip and knee PJI patients, regardless of surgical strategy. Given its favorable convenience and toxicity profile, it is an attractive antibiotic choice for staphylococcal PJI despite its high cost.

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### 322. Joint Spacer Retention, Antiinflammatory Suppression, and Risk of Re-infection

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**Background.** Two-stage exchange is the standard treatment of periprosthetic joint infection in the United States. Occasionally, for selected patients, temporary antibiotic-loaded spacers are retained “permanently” instead of proceeding with prosthetic re-implantation. It is unclear whether the “retained” spacer represents a nidus for re-infection, and would require secondary antibiotic suppression to prevent recurrence of infection. We aim to determine the risk of re-infection among patients with retained knee and hip spacers, and assess the role of antibiotic suppression.

**Methods.** We identified 51 patients with retained static or articulating knee (n = 34) and hip (n = 17) spacers between 1996 and 2014 using the Mayo Clinic Hospital Orthopedic database. Medical records were reviewed to collect clinical data,