July 2017 and March 2019 were included. Medical records were reviewed for site of positive GAS culture (blood, wound, joint fluid, or tissue cultures), demographics, comorbidities, surgical management, and antibiotic regimen and duration. The primary outcome was cure at 90 days defined as clinical improvement without recurrent or new infection, or further surgical or medical management at 90 days after treatment completion. The secondary outcome was erythrocyte sedimentation rates (ESR) before and after treatment.

Results. The median age of the 12 patients was 56 years (range 3–75); 58% were female and 58% had a body mass index ≥30 kg/m^2. The median Charlson comorbidity index score was 3 (range 0–7) with 58% having diabetes mellitus. Two patients had either rheumatoid arthritis or monoclonal gammopathy (Table 1). Most patients had severe infections; 33% with necrotizing fasciitis and 25% with orthopedic implants. All patients had an elevated initial ESR, including 75% with ESR >40 mm/h. 92% required surgery, including 42% amputations and 17% prosthesis removals. Patients were mostly treated with β-lactams and vancomycin (92%); only 50% received clindamycin or linezolid. Most patients (75%) required at least 2 weeks of antibiotics. Five patients (42%) were not cured at 90 days, and 1 died of infectious complications (Table 2).

Conclusion. Severe GAS orthopedic infections necessitate both surgical management and prolonged antibiotics. 42% of our patients were not cured at 90 days and most eventually required amputation. Toxin mediators, clindamycin and linezolid, were underutilized. Chronic suppressive antibiotics should be considered for patients with orthopedic implants, especially those with durable immune suppression.

Table 1: Patient Demographics and Host Factors

Patient	Age (years)	Gender	Body Mass Index (kg/m^2)	Charlson Comorbidity Index	Immunocompromising and vascular comorbidities
1	73	F	35	4	DM, MGUS
2	73	F	26	7	DM, PVD
3	53	M	32	2	DM
4	56	M	30	5	DM, PVD
5	59	M	33	3	DM, PVD
6	39	F	31	2	DM
7	75	F	29	4	-
8	3	F	17	0	-
9	37	F	26	1	DM
10	56	M	27	3	PVD
11	65	F	35	4	PVD
12	54	M	36	3	RA

DM: diabetes mellitus, MGUS: monoclonal gammopathy of unknown significance, PVD: peripheral vascular disease, RA: rheumatoid arthritis

Table 2: Patient Treatment and Clinical Outcomes

Patient	Orthopedic Infection(s)	Site(s)	Surgical Management	Targeted Antibiotic Treatment	Total Duration of Targeted Antibiotics	Initial ESR (mm/h)	ESR after Treatment Completion (mm/h)	Cure at 90 days	Comments
1	Necrotizing fasciitis and osteomyelitis	Right leg (metal plates in tibia)	I&D, fasciotomy	Ceftriaxone for 6 weeks, then amoxicillin/clavulanate for 2 weeks	8 weeks	110	39	Yes	IVIG x 3 days
2	Flexor tenosynovitis	Left hand	I&D	Ceftriaxone and metronidazole for 4 days, then amoxicillin/clavulanate for 10 days	2 weeks	55	-	Yes	
3	Flexor tenosynovitis	Right hand	I&D	Ampicillin/sulbactam for 3 days, then amoxicillin/clavulanate for 2 weeks	17 days	101	47	Yes	
4	Necrotizing fasciitis and osteomyelitis	Left foot	I&D, below knee amputation	Vancomycin and piperacillin/tazobactam for 5 days, then ceftriaxone and clindamycin for 1 week, then linezolid for 17 days	29 days	>140	-	No	
5	Osteomyelitis	Left foot	Foot amputation	Linezolid for 4 weeks	4 weeks	46	-	No	
6	Osteomyelitis	Right foot	None	Vancomycin and piperacillin/tazobactam for 3 days	3 days	72	-	No	Patient left against medical advice
7	Necrotizing fasciitis and osteomyelitis	Right foot	Foot amputation	Vancomycin and piperacillin/ tazobactam for 4 days, then ceftriaxone and clindamycin for 3 days, then ampicillin/sulbactam for 2 weeks	3 weeks	85	-	Yes	Co-infection with MSSA
8	Septic arthritis and osteomyelitis	Left hip and femur	I&D	Vancomycin and ceftriaxone for 1 week, then cephalexin for 6 weeks	7 weeks	40	-	Yes	
9	Prosthetic joint infection	Right ankle	I&D, antibiotic beads, prosthesis removal	Ceftriaxone and clindamycin for 1 week, then ceftriaxone alone for 5 weeks	6 weeks	114	41	Yes	
10	Osteomyelitis	Right foot	Foot amputation	Vancomycin and ciprofloxacin for 5 days, then cefazolin for 1 week	12 days	35	-	No	Co-infection with MSSA
11	Necrotizing fasciitis and osteomyelitis	Right leg	Below knee amputation	Vancomycin, clindamycin and meropenem for 11 days	11 days	27	-	No	Co-infection with *P. stuartii*, deceased within 90 days
12	Prosthetic joint infection	Right knee	I&D, one-stage prosthesis revision	Ceftriaxone and clindamycin for 1 week, then ceftriaxone alone for 5 weeks	6 weeks	53	-	Yes	Suppressive cephalexin for ≥ 1 year due to concomitant immuno-suppressive therapy for RA

ESR: erythrocyte sedimentation rate, I&D: incision and drainage, IVIG: intravenous immunoglobulin, MSSA: methicillin-sensitive *S. aureus* , RA: rheumatoid arthritis

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381. Clinical Outcome of Polymicrobial Prosthetic Joint Infection Managed with Debridement, Antibiotics, and Implant Retention (DAIR)

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Background. Polymicrobial (PM) prosthetic joint infections (PJIs) account for 4% to 37% of all PJIs. There is limited literature on surgical debridement, antibiotics and implant retention (DAIR) in PMPJIs. We aimed to assess clinical outcomes of PMPJIs managed with DAIR.

Methods. A retrospective cohort was studied at three Ascension hospitals in Detroit from January 2012 to December 2018. Cases were identified using the International Classification of Diseases, 9th and 10th Revision code specific for PJIs. Patient's electronic medical records were reviewed.

Results. Twenty-six PMPJIs managed with DAIR were identified. Mean age of the infected patients was 66 years. 18 (69%) patients were female and 19 (73%) were caucasians. Infected sites were hip in 15 (58%), knee in 10 (38%) and ankle in 1 (4%) patient. 22 (85%) patients had osteoarthritis, 3 (12%) had diabetes, 3 (12%) were on steroids and 1 (4%) had rheumatoid arthritis. Symptom onset of less than a week was noted in 14 (58%) and 3 or more weeks in 8 (31%) patients. Pain, swelling and drainage were present in 21 (81%), 13 (50%) and 18 (69%) cases. Fever on admission was noted in 7 (27%) patients. 11 (42%) patients were re-admitted in the following 12 months after DAIR. 2 (19%) patients developed superficial surgical site infection (SSI) while 9 (81%) had deep SSI. Implant removal was needed in 6 (55%) patients. 5 (2 superficial and 3 deep) patients required further debridement and antibiotics. 5 (19%) had good outcome with 3–6 months of antibiotics. 3 (12%) patients required long-term chronic suppressive therapy. One patient died from a cardiac event during follow-up.

Conclusion. In our study, PMPJIs managed with DAIR had high readmission rates and deep surgical site infections. DAIR failure, noted in 23% of our cases, required implant removal within 12 months of follow-up.

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

382. Difference in Pathogens Between Hip and Knee Prosthetic Joint Infection

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Background. There is contradicting evidence characterizing the difference in pathogens that cause hip and knee prosthetic joint infection (PJI). A possible difference in microbiology may inform choice in antibiotic etiology, prophylaxis, and empiric treatment. We sought to analyze a large cohort of PJIs to see whether there was a significant difference in pathogen between joints.

Methods. A retrospective cohort of hip and knee PJIs, from 2008 to 2016, were identified by ICD code and surgical codes. The PJI pathogen was identified from synovial or intra-articular tissue cultures. The Student's t-test was used to compare continuous variables. Chi-square tests were used to compare the categorical variables to joint.

Results. 807 PJI cases were identified including 444 knees and 363 hips. There were no significant differences between hip and knee PJIs in age, sex, history of PJI, rheumatoid arthritis, Charlson comorbidity index and laterality. There was a higher frequency of diabetes in knee PJIs (25.3%) compared with hip PJIs (15.7%), $P < 0.001$. No significant difference was found in the prevalence of fungal, staphylococcal (including *Staphylococcus aureus*), streptococcal, or enterococcal pathogens between hip and knee PJIs.

Conclusion. In this single-center cohort, hip and knees PJIs are infected with similar pathogens. Multiple site studies are needed to characterize the microbiology of PJIs at a larger scale.

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

383. Rheumatic Disease Patients Have More Culture Negative Prosthetic Joint Infections: Are There Clinical Differences?

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Background. Rheumatic disease (RD) patients are at increased risk for prosthetic joint infections (PJI), however, diagnosis is challenging because active RD may mimic joint infection. We aimed to assess the incidence of culture-negative (CN) PJI in a population of RD and osteoarthritic (OA) PJI using an institutional PJI registry. Baseline clinical differences between CN-RD and culture-positive (CP)-RD as well as the relationship of culture negativity to survivorship of the prosthesis were also evaluated.

Methods. A retrospective cohort of hip and knee PJIs, from 2009 to 2016, were identified by ICD codes, and confirmed by chart review. RD cases were identified by ICD code and use of RD-specific medications. CN cases were defined as PJIs with no evidence of microbial growth in intraoperative cultures. Demographics, medications, microbiology, surgical therapy and outcome were abstracted. Baseline characteristics were evaluated using Fisher's exact and Chi-Square tests. Kaplan–Meier estimates were used to calculate survivorship.

Results. 803 PJI cases were identified including 36 RD (33 rheumatoid arthritis and 3 systemic lupus erythematosus) and 771 OA. A higher proportion of RD PJI were CN ($N = 10$, 27%) vs. OA PJI ($N = 109$, 14%, $P = 0.02$). Fewer CN-RD cases met PJI histopathology criteria compared with CN-OA, ($P = 0.08$). On average, RD-CN were younger than OA-CN (59 vs 69, $P = 0.01$), but no different than RD-CP cases. One year survivorship of CN-OA and CN-RD were 87% and 66%, respectively and 47% for CP-RD. Comparing CN-RD vs. CP-RD, no difference was observed in age, smoking, diabetes, or Charlson comorbidities, but a trend toward higher prevalence of prior PJI in the CN-RD group. Clinically, no differences were found in surgical treatment ($P = 0.92$) or use of biologics and DMARDs ($P = 0.12$) between CN and CP RD patients.

Conclusion. RD PJIs are more likely to be culture-negative than OA PJIs. Prior PJI, histopathology and better outcomes suggest biologic differences that should be explored further.

Figure 1 The Kaplan-Meier curve representing implant survivorship after prosthetic joint infection treatment for rheumatic disease(RD) was 66% at 1 year for culture negative (red) and 47% for culture positive (blue), p=0.163.

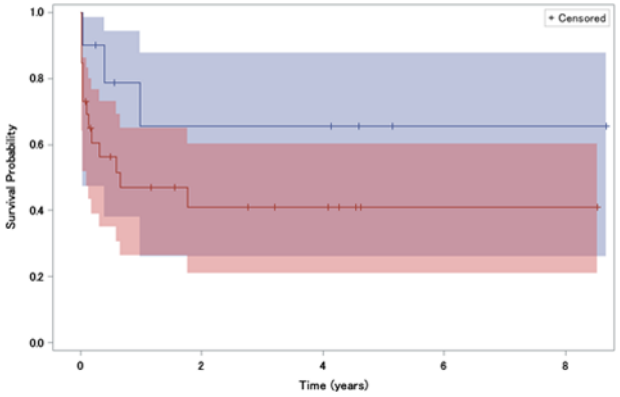

Table 1 Patient characteristics in the rheumatic disease (RD) prosthetic joint infection (PJI) group. (culture negative, CP; culture negative, CN; I&D, irrigation and debridement)

	Total RD (N=36)	CN-RD (N=10)	CP-RD (N=26)	p-value
Age	58.55 (11.41)	59.04 (10.21)	58.35 (12.02)	0.986
Body mass index	26.81 (11.48)	25.88 (9.81)	27.16 (12.23)	0.697
Sex				1.000
Female	28 (77.78)	8 (80)	20 (76.92)	
Male	8 (22.22)	2 (20)	6 (23.08)	
Joint				0.285
Knee	16 (44.44)	6 (60)	10 (38.46)	
Hip	20 (55.56)	4 (40)	16 (61.54)	
History of Smoking	4 (11.11)	1 (10)	3 (11.54)	1.000
Diabetes	5 (13.89)	0 (0)	5 (19.23)	0.293
History of prior PJI	2 (5.56)	2 (20)	0 (0)	0.071
Surgical Therapy				0.791
One Stage Exchange	1 (2.78)	0 (0)	1 (3.85)	
Two Stage Exchange	18 (50)	6 (60)	12 (46.15)	
I&D	17 (37.23)	4 (40)	13 (50)	

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384. Denosumab-Related Osteonecrosis of the Jaw: an Emergent and Potentially Complex Bone and Joint Infection

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Background. Osteonecrosis of the jaw is a known complication of antiresorptive treatment, like bisphosphonate. More recently, denosumab was validated as a treatment in the osteoporosis and bone metastasis. Its mechanism is different from bisphosphonate but induces also a decrease of bone resorption and a risk of osteonecrosis of the jaw. In case of treatment failure by a dental surgeon or in complex cases, patients could be addressed to a bone and joint infection (BJI) reference center. The aim of this study was to analyze microbiology, as well as surgical and medical care of patients who present denosumab-related osteonecrosis of the jaw (DRONJ) and who were treated in a bone and join reference center.

Methods. All patients managed in our BJI reference center between January 2013 and December 2018 for a DRONJ were included in our retrospective observational monocentric cohort.

Results. Twelve patients (median age 71; ratio M/W 0.7) with a DRONJ (metastatic cancer, n = 10 (83%)) in grade 3 (n = 5), 2 (n = 4), 1 (n = 3) were included. Only 3 patients (25%) had a dental health control before initiating the treatment by denosumab and 7 patients (58%) had a dental surgical procedure done before the DRONJ. Eleven patients had a bone exposure, treated at least with a scaling and mucosal closure at the same time. All infections with bacterial cultures (n = 11 (91%)) were polymicrobial, including 8 (72%) with Streptococcus spp; 8 (72%) with anaerobia including 2 (18%) with Actinomyces; 5 (45%) with Staphylococcus spp; 5 (45%) with enterobacteria; 3 (27%) with Candida spp; 2 (17%) with a non-fermentative Gram-negative bacilli and 7 (64%) with others bacteria. All patients (n = 12) received a betalactam, 8 (66%) a lincosamide or a synergistin, 5 (41%) an antifungal, 5 (41%) metronidazole, 4 (33%) a fluoroquinolone, 3 (25%) a glycopeptide and 2 (17%) other antibiotics. The median follow-up was 6 months. Eight patients were cured after a medico-surgical care and a median duration of antibiotics of 97 days (including 28.5 days in intravenous). 2 patients required a suppressive antibiotic treatment, 1 relapsed at a distance of the treatment and 1 died from some other causes.

Conclusion. DRONJ is a potential complex BJI, for which some patients could benefit from medical care in a BJI reference center.

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385. Arthroscopic vs. Open Surgery for Septic Arthritis of the Knee: A Systematic Review and Meta-Analysis

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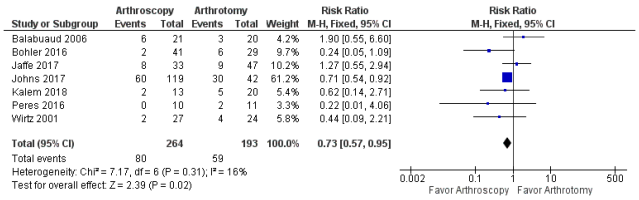
Background. Septic arthritis is a joint-threatening and life-threatening infection, with the knee representing the most frequently involved joint. There is no definitive treatment algorithm for the management of this condition, which typically includes surgical debridement to decompress the joint, followed by organism-specific intravenous antibiotics.

Methods. Search Methods. MEDLINE (1965–2018), SCOPUS (1973–2018), The COCHRANE Library (2006–2017), EMBASE (1974–2018), reference lists, and scientific meetings were searched for relevant studies on the treatment of native knee septic arthritis by three independent reviewers. No language restrictions were used. Selection criteria included all studies reporting on native knee septic arthritis in adults treated with arthroscopy and open arthrotomy with irrigation and debridement. Data Collection and Analysis Studies were identified, subjected to inclusion and exclusion criteria, and reviewed by three independent reviewers. Patient characteristics, interventions, and outcomes were extracted, and the trials were rated for quality based on established criteria. A meta-analysis was conducted for the primary outcome, reoperation occurring after arthroscopic vs. open arthrotomy irrigation and debridement for the treatment of septic arthritis. We used a qualitative analysis for secondary outcomes physical function and hospital length of stay.

Results. From 624 abstracts, eight trials met inclusion criteria, one randomized controlled trial and seven retrospective cohorts. Quantitative meta-analysis showed arthroscopic irrigation and debridement resulted in fewer reoperations compared with open arthrotomy (RR = 0.76; 95% CI 0.59–0.97, P = 0.03, I^2 = 24%), Figure 1. A qualitative summary of seven included studies assessing physical function showed arthroscopic debridement results in improved functional outcomes and range of motion compared with open arthrotomy. Based on four trials, qualitative summary demonstrated that arthroscopic debridement results in decreased hospital length of stay compared with open arthrotomy.

Conclusion. Arthroscopic irrigation and debridement is favored over open arthrotomy with regard to lower rates of reoperation, improved functional outcomes, and shorter hospital length of stay.



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386. Blue Light Reduces Cutibacterium (Propionibacterium) Acnes Bacterial Burden: Orthopedic Shoulder Infection Prevention Strategy?

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Background. *Cutibacterium acnes (C. acnes)* is a common shoulder periprosthetic joint infection (PJI). Blue light (BL) is effectively used in the dermatologic clinical setting against acne vulgaris caused by *C. acnes.* Photodynamic therapy (PDT) is the use of light source and photosensitizer (PS) to enhance antimicrobial activity. We studied the effect of PDT using BL and PS *in vitro* on shoulder PJI isolates of *C. acnes.*

Methods. 19 strains were grown in thioglycollate medium and diluted in sterile normal saline (NS) to a turbidity of 0.5 McFarland standard; OD_{600} of 0.1 to 0.15. 250 µL with PS added were placed in 96-well plates at 37ºC, exposed to BL (415 nm) placed 1 cm above for 0 to 60 minutes at 15-minute intervals. Susceptibility to BL alone, and BL with PSs such as riboflavin (R, Vit B2), fluorescein (F) or demeclocycline (tetracycline antibiotic, "D") were studied. After serial 10-fold dilution with NS, 3 µL of each well were spotted onto Brucella Blood Agar plates and incubated anaerobically