

# Management and outcomes of Native spinal infection via COpAT at a UK Teaching Hospital: Retrospective Audit Against IDSA Guidelines

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## BACKGROUND

Native spinal infections, including spondylodiscitis and facet joint septic arthritis carry significant mortality and morbidity. Evidence underpinning accepted best practice remains limited.

This study aimed to review management of patients with native spinal infections against IDSA guidelines [1] to highlight areas for service improvement.

## MATERIALS AND METHODS

We retrospectively reviewed management of adults with native spinal infection under our Complex Outpatient Antibiotic Therapy (COpAT) service with at least one year follow-up between 2022-2025. Metalwork-associated infections were excluded.

Cases were assessed against IDSA guideline standards: baseline investigations, imaging, microbiological sampling, antimicrobial choice and duration.

Outcome at one year (recurrence requiring further antibiotic treatment vs resolution) was also recorded.

### Inclusion Criteria:

- Clinical diagnosis of discitis, vertebral osteomyelitis or facet joint septic arthritis
- Managed via the complex outpatient antimicrobial therapy team (COpAT)
- One year follow up/elapsed post diagnosis

### Definitions:

- Treatment failure: Non-resolution or recurrence
- Non-resolution: ongoing infection or antibiotic use for native spinal infection at one year after diagnosis
- Recurrence: recurrence of infection after completion of initial treatment, requiring additional, unplanned antibiotic courses

## COHORT SUMMARY

47

Patients

74

Median Age

44%

Male

We identified 47 patients who met inclusion criteria. The cohort had median Charleston co-morbidity index of 4 (IQR 2-5) and average age of 74 which reflects typical spinal infection cohorts.

### CO-MORBIDITIES-

|                         |            |
|-------------------------|------------|
| CKD (eGFR <60)          | 12 (25.5%) |
| Active malignancy       | 8 (17.0%)  |
| Diabetes mellitus       | 7 (14.9%)  |
| Immunosuppression       | 6 (12.8%)  |
| Endovascular infection  | 6 (12.8%)  |
| Current smoker          | 6 (12.8%)  |
| Liver disease           | 1 (2.1%)   |
| Endovascular prosthesis | 1 (2.1%)   |

### ASSOCIATED COMPLICATIONS

|                         |            |
|-------------------------|------------|
| Vertebral osteomyelitis | 34 (72.3%) |
| Epidural collection     | 23 (48.9%) |
| Soft tissue collection  | 22 (46.8%) |
| Multilevel infection    | 23 (48.9%) |
| Surgical debridement    | 4 (8.5%)   |

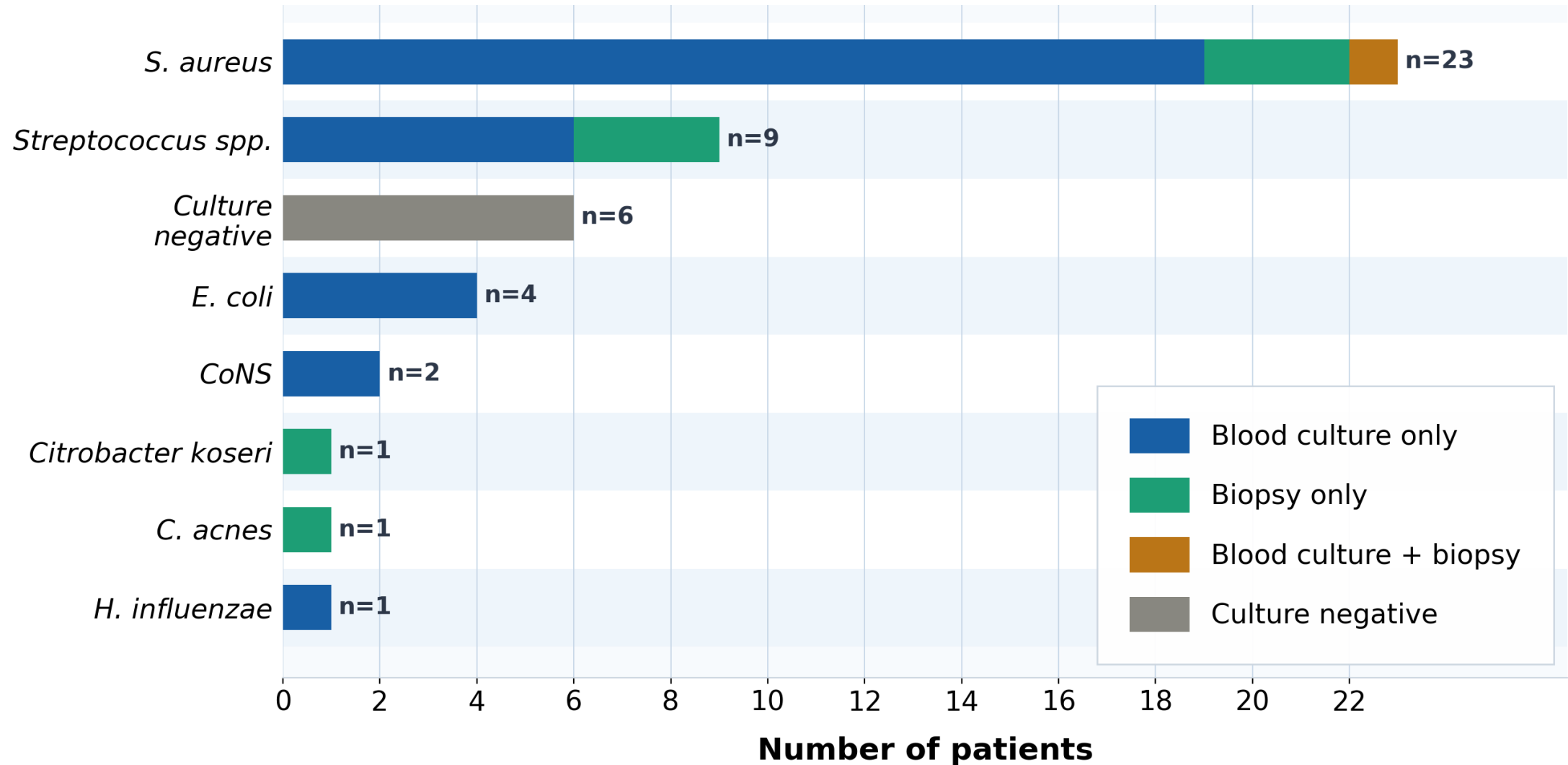


Figure 1. Summary of isolates and methods of sampling.

## DIAGNOSIS AND INVESTIGATIONS

**IDSA Standard 7 – It is recommended that all patients with suspected native vertebral osteomyelitis (NVO) have a baseline CRP and/or ESR measured, and two sets of blood cultures taken at baseline.**

We found that 98% (46/47) had a CRP documented at diagnosis. Blood culture are central to the microbiological diagnosis of discitis. 100% (47/47) patient had a least one set of blood cultures at presentation but only half (53%, 25/47) had the recommended 2 sets of blood cultures. The yield between 1 vs. ≥2 sets was 63.6% vs 76% respectively.

**IDSA Standard 8 / 9 – It is recommended that all patients with suspected NVO undergo MRI spine. If this is not possible it is suggested that patients undergo spine gallium/Tc99 bone scan or computed tomography scan or a positron emission tomography**

In this cohort, 83.0% of patients (39/47) underwent MRI as part of their diagnostic workup; of these, nine (23.1%) had initial imaging with CT. The remaining 17.0% (8/47) were investigated with CT alone. The reasons for MRI non-performance were not systematically recorded.

**IDSA Standard 14/15 - We recommend an image-guided aspiration biopsy in patients with suspected NVO when a microbiologic diagnosis for a known associated organism is absent (S. aureus, S. lugdunensis)**

Among the 20 patients with *S. aureus* confirmed from blood cultures, only one (5%) underwent image-guided biopsy. Of the 14 patients with negative blood cultures, 11 (78.6%) proceeded to image-guided biopsy, while three (21.4%; patients 3, 4, 11) did not. Among patients with non-*S. aureus* blood culture positivity, only 2/13 (15.4%) underwent biopsy, which in most cases plausible bacteria from blood cultures already existed.

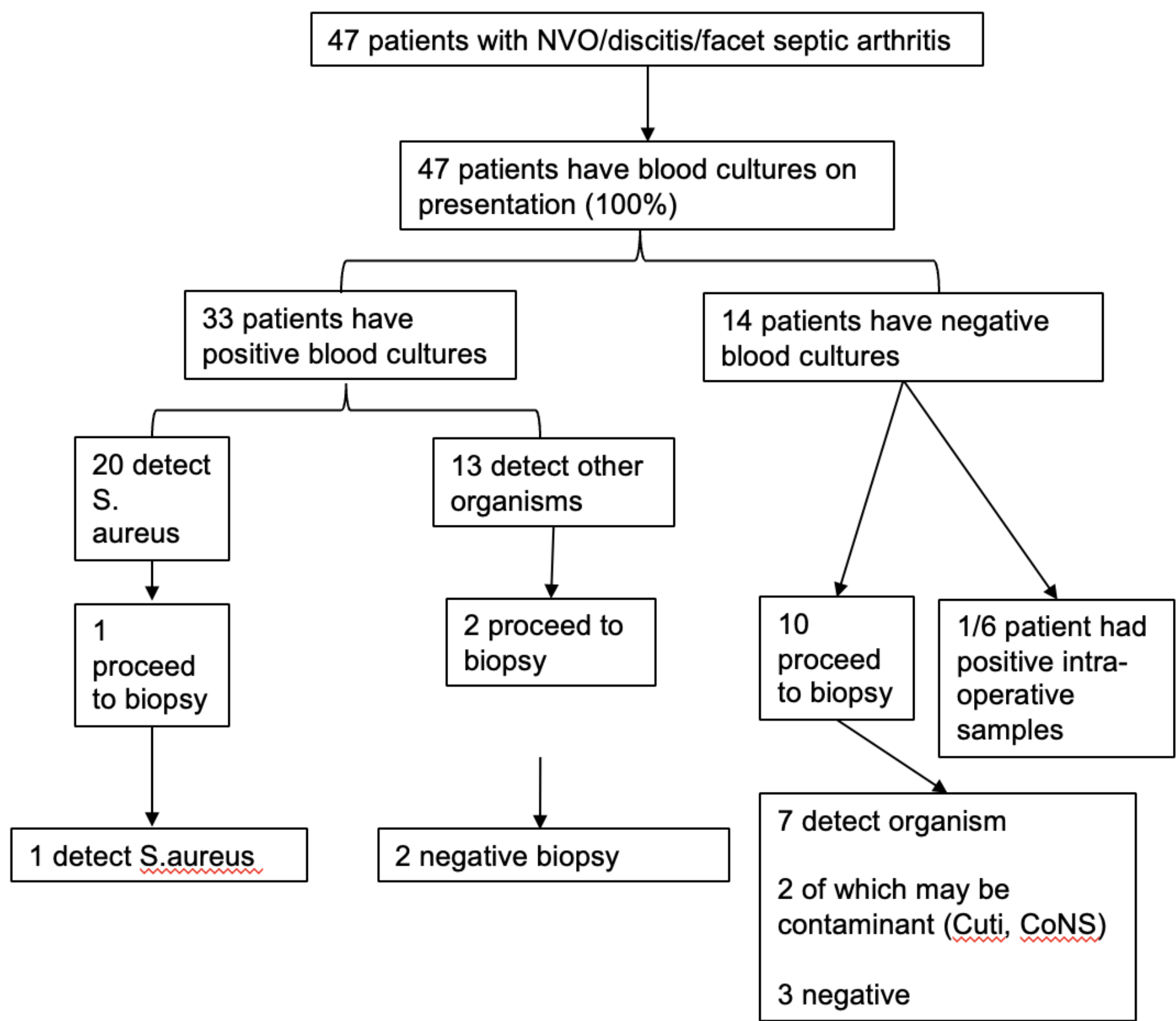


Figure 2. Summary of diagnostic pathways including blood cultures and biopsy.

**IDSA Standard 21 / 23 – It is suggested that all patients with no microbiological diagnosis undergo a second aspiration biopsy if the first biopsy is non-diagnostic. This includes specimens with no growth or growth of a presumed skin contaminant**

Of the 14 patients with negative blood cultures, 10 (71.4%) proceeded to percutaneous biopsy; of these, three yielded no growth and two grew probable contaminants (*Cutibacterium acnes* and *CoNS*), giving a non-diagnostic first biopsy rate of 50% (5/10). Five should have undergone repeat sampling; however, a second biopsy only occurred in 1/5 cases.

## ANTIBIOTICS AND THERAPY

**IDSA Standard 26 – It is recommended all patients have six weeks of parenteral or highly bioavailable oral antimicrobial therapy for bacterial NVO (with the exceptions of infection caused by *Brucella* or TB)**

Note that the IDSA guidelines exclude beta-lactam antibiotics as orally bioavailable – so excluded amoxicillin, co-amoxiclav and cefalexin.

Of the 47 patients, 87.2% (41/47) received at least six weeks of parenteral or highly bioavailable oral antimicrobial therapy. The six non-adherent cases fell into two patterns: three patients achieved a six-week calendar duration but completed their course with non-bioavailable oral beta-lactams (amoxicillin or cefalexin).

Most non-*Staphylococcus aureus* patients (20/24, 83.3%) had successful treatment. However, *Staphylococcus aureus* had a failure rate (including relapse and recurrence) of 26.1% (6/23).

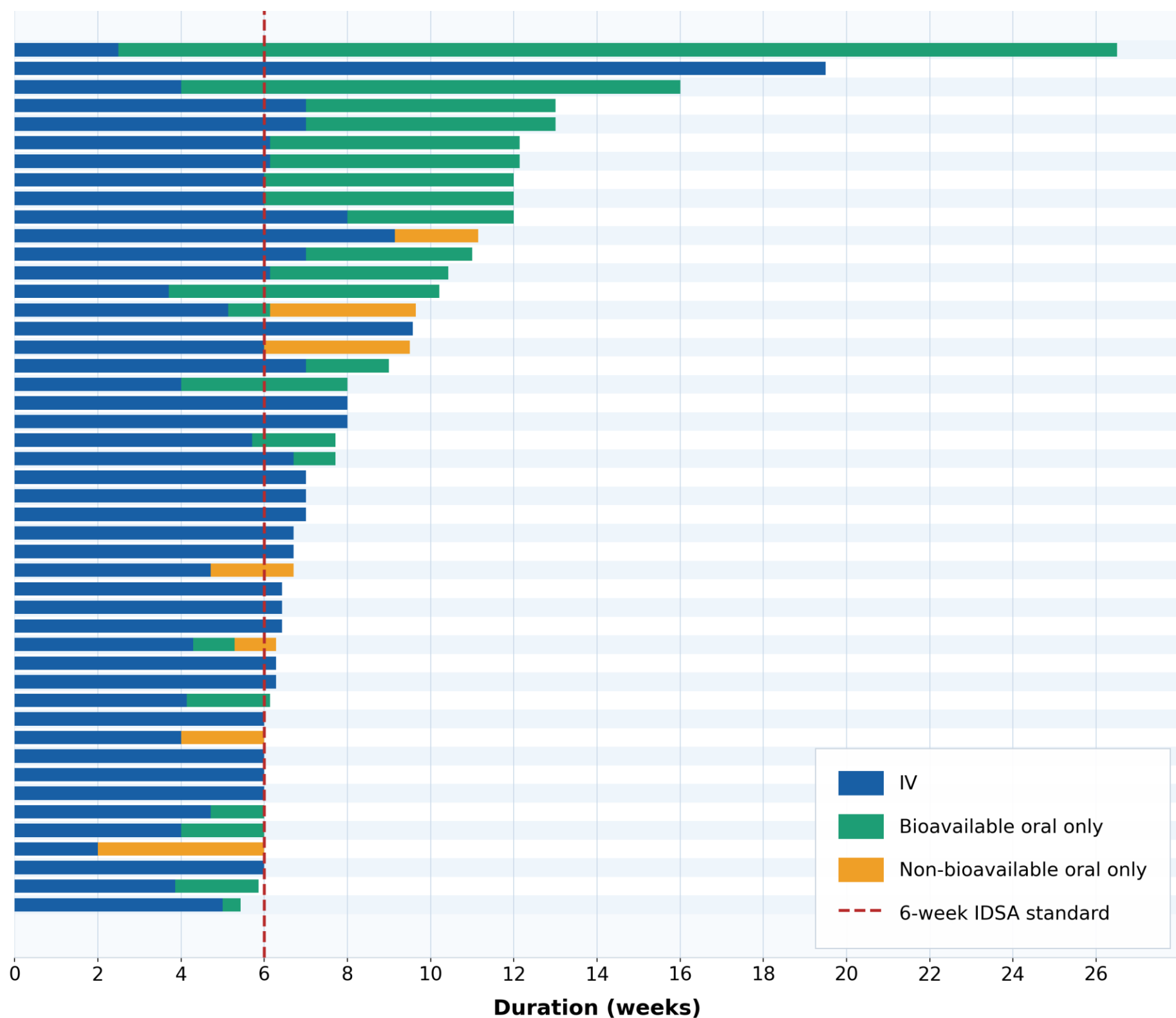


Figure 3. Summary of treatment duration per patient included in the cohort

## DISCUSSION

Adherence to IDSA guidelines was variable. When a plausible non-*Staphylococcus aureus* organism was isolated on blood culture, treatment success rates were high, indicating that further biopsy may not always add clinical benefit.

Repeat biopsies were uncommon following non-diagnostic biopsies, despite recommendations.

Our patients were typically managed with prolonged IV courses of antibiotics prior to any oral antibiotic switch. Duration of antibiotics or route did not appear to impact failure rates in the overall cohort.

Failure rates were highest in *Staphylococcus aureus* spinal infection which suggest that more aggressive or prolonged treatment and closer follow-up is indicated in this patient cohort. These findings support targeted quality improvement in microbiological diagnosis, risk stratification and treatment guidelines for patients with native spinal infections.

## REFERENCES

: 1. Berbari EF et al. 2015 IDSA Clinical Practice Guidelines for the Diagnosis and Treatment of Native Vertebral Osteomyelitis. Clin Infect Dis 2015;61:e26-46. 2. Li HK et al. Oral versus Intravenous Antibiotics for Bone and Joint Infection (OVIVA). N Engl J Med 2019;380:425-436.