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Management and Outcomes of Paediatric Bone and Joint Infections in a Regional Australian Hospital: A 10-Year Retrospective Study

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ABSTRACT

Aim: To evaluate clinical features, management, and outcomes of paediatric bone and joint infection (BJI) in a regional Australian hospital and assess weight-based oral antibiotic prescribing.

Methods: We conducted a retrospective study of 171 children aged 0–18 years admitted with septic arthritis and/or osteomyelitis between 2011 and 2021. Cases were identified using ICD-10-AM codes, and data on clinical presentation, microbiology and treatment were extracted from medical records. Oral antibiotic doses were assessed against international evidence-based guidelines.

Results: A total of 171 children were included (median age 27 months); 59.6% were aged ≤5 years, and 13.5% identified as Aboriginal or Torres Strait Islander. *Staphylococcus aureus* was the most frequently identified pathogen overall (53/108, 49.1%), and *Kingella kingae* in children <5 years of age (20/57, 35.1%). Severe disease occurred in 29.8%. Oral antibiotic doses were below international guideline recommendations in 43.3% of cases, mostly with amoxicillin–clavulanate and cephalexin. Relapse (4.1%) and long-term sequelae (6.1%) were infrequent.

Conclusions: Paediatric BJI mostly occurred in young and in Aboriginal and Torres Strait Islander children. Oral antibiotic weight-based dosing was often lower than international guideline recommendations for BJI. These findings highlight the need for standardised antibiotic dosing in BJI and further studies to optimise dosing in children.

1 | Introduction

Bone and joint infections (BJIs), consisting of septic arthritis and osteomyelitis, are common in children and have high impact at a patient and population level [1]. Optimal management depends on timely diagnosis, appropriate antibiotic therapy and in some cases, surgical management [2]. International guidelines support early intravenous-to-oral (IV-to-PO) switch for children with BJI [3–5]. This requires careful weight-based dosing of antibiotics, access to appropriate antibiotic formulations and guidelines for clinical care. Deviation from evidence-based antibiotic dosing may lead to inadequate concentration within sites of infection and increase the risk of treatment failure or relapse.

Despite the prevalence of BJI, there is a lack of recent Australian data describing the epidemiology, microbiology, or outcomes of paediatric BJI. Furthermore, the consistency of oral antibiotic dosing and whether underdosing impacts clinical outcomes has not been systematically examined.

In a 10-year retrospective analysis of paediatric BJI at a regional Australian tertiary hospital, we describe the clinical presentation, microbiology, antibiotic dosing and clinical outcomes.

Key Points

- What is already known on this topic?
  - Bone and joint infections (BJIs) are common in children and can cause significant morbidity.
  - Early transition from intravenous to oral antibiotics is supported by international guidelines.
  - There is limited current Australian data on paediatric BJI, particularly regarding the appropriateness of oral antibiotic dosing and associated clinical outcomes.
- What this paper adds?
  - Most BJI occurred in children < 5 years of age and in Aboriginal and Torres Strait Island children
  - Oral cephalexin and amoxicillin–clavulanate doses commonly reflected Australian paediatric dosing references, which are lower than international BJI-specific dosing recommendations.

2 | Materials and Methods

2.1 | Setting

This retrospective study was conducted at one of three tertiary children's hospitals in the state, serving a referral region of 131 785 km^2. John Hunter Children's Hospital has over 25 000 emergency department presentations and 10 000 admissions each year. From 2011 to 2021, standard care for children with BJI included intravenous (IV) antibiotics, surgical intervention as indicated and transition to oral antibiotics when clinically appropriate. A Paediatric Improvement Collaborative (PIC)-endorsed guideline was published in 2020 [6], however, no local clinical practice guideline was available prior. Infectious disease consultation input was available where requested. Patient follow-up was routinely arranged with Orthopaedic or Infectious Diseases clinicians within 2 weeks of discharge and continued until clinical improvement.

2.2 | Inclusion Criteria

Children aged 0–18 years admitted to the study site from 1 January 2011 to 1 January 2022 were included. Cases were identified using ICD-10-AM codes for septic arthritis (M00.0, M00.1, M00.2, M00.8, M00.9) and osteomyelitis (M86.0, M86.1, M86.2, M86.8, M86.9). Septic arthritis and osteomyelitis were diagnosed by the treating team based on clinical assessment, supported by radiological and/or microbiological findings. Reactive arthritis, as documented by the treating clinical team as the most likely diagnosis, was excluded. We excluded cases of subacute and chronic osteomyelitis (symptoms > 2–6 weeks at presentation) as it differs in pathophysiology and management.

2.3 | Data

Data were extracted from the paper medical record and recorded using REDCap electronic data capture. A second researcher reviewed any discrepancies, particularly with regard to diagnosis. Demographics, clinical features, treatment and outcomes were collected. Residence was classified as metropolitan, regional or rural, using postcode data and definitions from the Australian Bureau of Statistics [7]. Symptom duration > 72 h prior to first seeking medical care was recorded. 'Alternative diagnosis' referred to provision of an alternate diagnosis by a health practitioner (including a general practitioner or emergency physician) in the 7 days prior to hospital admission.

Severe disease was defined as any of the following: contiguous spread of primary infection to surrounding tissues/structures (as indicated by documentation in operative or radiologic reports), return to theatre, multifocal disease, persisting bacteraemia for more than 72 h after initiation of empiric antibiotic therapy, admission to intensive care or death. Microbiological data, including blood cultures, fluid or tissue cultures and molecular diagnostic testing, were extracted from the Auslab Laboratory Information System. *Kingella kingae* PCR testing became available for clinical use in 2014. Cases with multiple organisms identified from the same specimen were excluded from analysis.

IV antibiotic duration was calculated from medication charts, while oral antibiotic doses were extracted from discharge notes and reconciled with medication prescriptions. Antibiotic dosing was recorded in milligrams per kilogram per day, using the recorded weight at the time of prescription. International consensus guidelines were used as the primary reference for weight-based dosing to enable comparison with international standard of care, rather than the locally available dosing reference, the Australian Medicines Handbook (AMH) [8]. The reference doses were: flucloxacillin or dicloxacillin 100 mg/kg/day; amoxicillin or amoxicillin–clavulanate (amoxicillin component) 50–120 mg/kg/day; cephalexin 75–120 mg/kg/day and trimethoprim/sulfamethoxazole (trimethoprim component) 6–12 mg/kg/day [3–5]. Outcome data included death, intensive care admission, length of hospital stay and relapse (defined as readmission to hospital within 30 days of discharge due to proven or suspected BJI recurrence) and long-term sequelae (persisting pain, restricted movement, reduction in daily function, growth arrest, pathological fracture or chronic osteomyelitis).

Descriptive statistics were used for all variables. Statistical analysis was performed using GraphPad Prism version 10.5 (GraphPad Software, San Diego, CA). Planned subgroup comparisons were conducted by age group (≤ 5 vs. > 5 years), and Aboriginal and Torres Strait Islander vs. non-Aboriginal and Torres Strait Islander groups. Categorical variables were compared using Fisher's exact test (two-sided, $p < 0.05$). Missing data were minimal and are reported as denominators where applicable; no imputation was performed.

This study was approved by the Human Research Ethics Committee of Hunter New England Local Health District (Reference: AU202211-04).

3 | Results

A total of 306 cases were identified (Figure S1); 135 records were excluded, including reactive or inflammatory arthritis (104), skin/soft tissue infection (21) and final analysis includes 171 cases of clinically or radiologically diagnosed BJI, consisting

of 107 cases of septic arthritis, 41 cases of osteomyelitis and 23 cases of septic arthritis with contiguous osteomyelitis.

3.1 | Epidemiology

The majority of children (59.6%, 102/171) were 5 years or younger (Table 1) and the median age was 27 months (interquartile range 14–101.5). Sex distribution was equal (53.8% male). Aboriginal and Torres Strait Islander children accounted for 13.5% (23/171) of all paediatric BJI admissions. Most children resided in regional or rural areas (67.8%, 116/171) compared with metropolitan areas (24%, 41/171). Trends in yearly BJI admissions remained stable during the study period (Table S1).

3.2 | Presentation

The most common presenting symptoms were pain (71.3%, 122/171) and reduced motor function (66.7%, 114/171). Fever was absent or not recorded in 60 patients (35.1%). Pain and fever were significantly less common in children aged ≤5 years compared with those >5 years (pain: 58.8% vs. 89.9%, $p=0.0001$; fever: 54.9% vs. 79.7%, $p=0.0001$). A total of 43 children (25.1%)

TABLE 1 | Presentation of patients with bone and joint infection.

	All ages	≤5 years	>5 years	*p*
Demographic information				
Number of patients	171 (100)	102 (59.6)	69 (40.4)	n/a
Median age (IQR) months	27 (14–101.5)	15 (10–23.8)	122 (79–159)	n/a
Male sex	92 (53.8)	55 (53.9)	37 (53.6)	1.000
Aboriginal or Torres Strait Islander	23 (13.5)	15 (14.7)	8 (11.6)	0.651
Regional or rural residence	116 (67.8)	71 (69.6)	45 (65.2)	0.617
Alternative diagnosis[a]	52 (30.4)	30 (29.4)	22 (31.9)	0.7378
Symptom duration > 72 h before presentation	53 (31.0)	25 (24.5)	28 (40.6)	0.0294
Symptoms				
Fever	111 (64.9)	56 (54.9)	55 (79.7)	0.001
Pain	122 (71.3)	60 (58.8)	62 (89.9)	0.0001
Reduced motor function	114 (66.7)	80 (78.4)	34 (49.3)	0.0001
Swelling	35 (20.5)	19 (18.6)	16 (23.2)	0.5628
Symptom duration > 7 days	43 (25.1)	20 (19.6)	23 (33.3)	0.0493
BJI type				
Septic arthritis	107 (62.6)	67 (65.7)	40 (58.0)	0.3363
Osteomyelitis	41 (24.0)	20 (19.6)	21 (30.4)	0.1436
Combined SAOM	23 (13.5)	15 (14.7)	8 (11.6)	0.6512
Site of infection				
Lower limb	122 (71.3)	79 (77.5)	43 (62.3)	0.0389
Upper limb	30 (17.5)	23 (22.5)	7 (10.1)	0.0414
Vertebral	11 (6.4)	7 (6.9)	4 (5.8)	1.0
Other (skull, TMJ, mastoid)	5 (2.9)	3 (2.9)	2 (2.9)	n/a
More than one site	3 (1.8)	2 (2.0)	1 (1.4)	n/a
BJI severity				
Severe disease[b]	51 (29.8)	26 (25.5)	25 (36.2)	0.1727
Contiguous spread	39 (22.8)	22 (21.6)	17 (24.6)	0.7112
Return to operating theatre	23 (13.5)	11 (10.8)	12 (17.4)	0.2557
Admission to PICU	9 (5.3)	5 (4.9)	4 (5.8)	n/a
Multifocal disease	7 (4.1)	2 (2.0)	5 (7.2)	n/a
Persisting bacteraemia	1 (0.6)	0 (0)	1 (1.4)	n/a

[a]Defined as receiving an alternative diagnosis from a health practitioner in the 7 days prior to presentation to hospital.
[b]Severe disease defined as any of the following: primary infection contiguous spread to surrounding tissues, required return to theatre, required PICU admission, multifocal disease and persisting bacteraemia > 72 h after empiric antibiotic therapy initiated. Some patients with severe disease had more than one criterion, causing the total to surpass 51.

experienced symptoms for more than 7 days before admission, more frequently in those > 5 years (33.3% vs. 19.6%, $p = 0.0493$). History of prior or concurrent upper respiratory tract illness was reported in 29.2% (50/171). An alternative diagnosis was recorded in 30.4% (52/171).

Overall, BJI most affected the lower limbs (71.3%, Table 1). Septic arthritis mostly occurred in the knee (34.6%), hip (31.8%) and ankle or foot (9.3%) in the lower limbs. Upper limb involvement included the shoulder/sternoclavicular/acromioclavicular joints (7.5%), elbow (6.5%) and wrist or hand (4.7%), and was significantly more common in children aged ≤ 5 years (22.5% vs. 10.1%, $p = 0.0414$). Osteomyelitis occurred most frequently in the tibia (17.1%), femur (12.2%) and pelvis (9.8%). Vertebral osteomyelitis was identified in 11 cases (6.4%), with 7 occurring in children aged ≤ 5 years. Detailed anatomical distribution by age group is shown in Table S2.

3.3 | Microbiology

In 108 cases, a single pathogen was identified from blood, joint fluid, tissue or bone aspirate through culture or molecular methods (Figure 1 and Table S3). *Staphylococcus aureus* was the most common pathogen overall (53/108, 49.1%). In this cohort, Methicillin-resistant *S. aureus* was uncommon (5/53, 4.6%) and mostly occurred in Aboriginal and Torres Strait Islander children (3/5, 60%). *K. kingae* was only detected in those 5 years and younger, surpassing *S. aureus* as the most common pathogen in this group (20 vs. 11 cases). *Streptococcus pneumoniae* (six cases), *Haemophilus influenzae* (four cases, typing unavailable), *Neisseria meningitidis* (two cases) and *Group B Streptococcus* (one case) were only seen in those younger than 5 years. Some *S. pneumoniae* (2/6 cases) and *H. influenzae* (2/4 cases) occurred in children with incomplete or no vaccination. In 34.5% of cases (59/171), a causative pathogen was not identified. This was more common in those aged under 5 years (43 cases). There were four cases with more than one pathogen detected, which were not further analysed.

3.4 | Treatment and Outcomes

3.4.1 | Management

All children were primarily managed by orthopaedic specialists. General paediatrics and paediatric infectious disease specialists were involved in 33.9% and 8.2% of cases, respectively. The median length of hospital stay was 8 days (IQR 5–13) and admission to the PICU occurred in 5.3% of children (9/171) (Table 3). Most children underwent operative intervention (126/171, 73.7%), with about one fifth (23/126, 18.3%) requiring more than one operation.

3.4.2 | Antibiotic Treatment

Median duration of IV antibiotics was shortest for septic arthritis (6 days, IQR 4–10) and longest for vertebral osteomyelitis (14 days, range 6–28) and septic arthritis with contiguous osteomyelitis (14 days, IQR 5.5–23.5). Median total (IV and oral) duration was shortest for septic arthritis (26 days, IQR 21.0–30.5) and longest for vertebral osteomyelitis (42 days, range 28–56). Almost a third of children (53/171, 31%) had a peripherally inserted central catheter (PICC). Over the study period, the median duration of IV antibiotics decreased from 10 days in 2011–2016 to 5 days in 2017–2021.

Oral antibiotic prescription data (flucloxacillin/dicloxacillin, amoxicillin, amoxicillin–clavulanate, cephalexin or trimethoprim-sulfamethoxazole) were available for 141 children (82.5%). In 56.7% (80/141), antibiotic dosing was congruent with international guidelines (Table 4). The antibiotics most frequently prescribed below guideline-recommended doses were amoxicillin–clavulanate (29/30, 97%), followed by cephalexin (20/32) and flucloxacillin (9/41, 22%).

3.4.3 | Outcome

No deaths were reported and relapse within 30 days was uncommon (7/171, 4.1%). 148 children (86.5%) had documented follow-up at 3- to 6-months post-discharge. Nine children (6.1%) experienced long-term sequelae including pain (4/148, 2.7%), restricted movement (3/148, 2%), growth arrest (3/148, 2%) or pathologic fracture (2/148, 1.4%). One patient developed chronic osteomyelitis who had received oral flucloxacillin at a total daily dose of 52 mg/kg.

Among seven children with suspected or proven relapse within 30 days of initial discharge, the median age was 24 months (range 14–141 months), with six patients under 5 years old (Table 2). Hip septic arthritis was the most common diagnosis ($n = 3$), followed by knee, ankle, sacroiliac and tibia involvement. *K. kingae* was the most commonly detected organism ($n = 2$). The median IV antibiotic duration was 3 days (range 2–21), with a median total

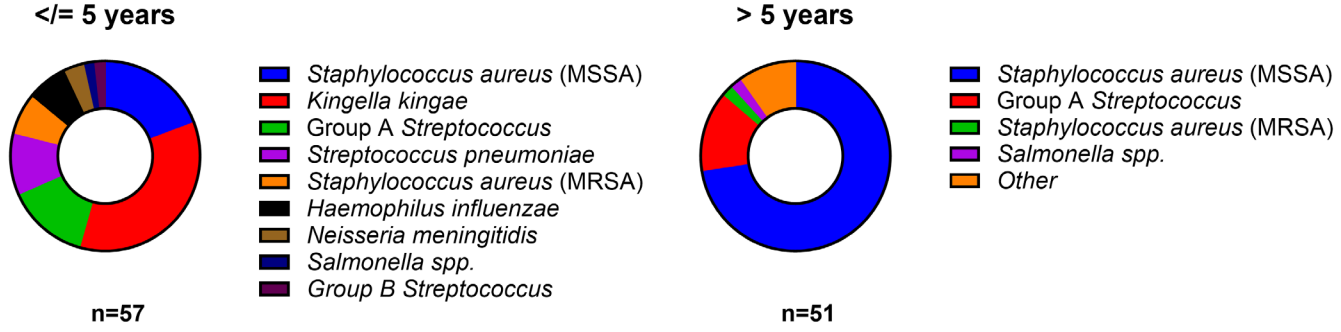

FIGURE 1 | Microbiology of bone and joint infections. Results based on blood culture, bone/joint culture or molecular testing in 108 patients. For additional detail, see Table S3.

antibiotic duration of 24 days (range 21–49). Six of seven patients had follow-up at 3–6 months. One patient experienced a pathologic fracture and chronic osteomyelitis, and five patients had no long-term sequelae. Four of seven relapses occurred in children prescribed oral doses below international recommendations. However, this is a descriptive observation only, and the study was not powered to assess statistical associations between dose and outcome.

4 | Discussion

This large, single-centre study provides a detailed analysis of paediatric BJI in Australia, highlighting disease burden, particularly among young (age < 5 years) and Aboriginal and Torres Strait Islander children. Aboriginal and Torres Strait Islander children comprised 13.5% of the cohort, consistent with previous Australian studies reporting a tenfold higher incidence of BJI in this population [9]. Brischetto [9] suggested this disparity may be related to a higher burden of skin infections, a known risk factor for invasive *Staphylococcus aureus* disease, but it is also likely influenced by broader social, geographic and health system inequities. In our cohort, a greater proportion of Aboriginal and Torres Strait Islander children had symptom duration > 72 h before presentation compared with non-Aboriginal and Torres Strait Islander counterparts (10/23, 43.5% vs. 42/148, 30.9%, Table S4) potentially due to barriers to timely care. Our findings underscore the importance of early recognition and targeted intervention in at-risk populations.

Children younger than 5 years were less likely to present with fever (54.9% vs. 79.7%, $p = 0.0001$) or report pain (58.8% vs. 89.9%, $p = 0.0001$) compared to older children. This may have contributed to diagnostic uncertainty, particularly in primary care settings where clinicians may favour non-infectious causes such as trauma. While most children presenting to primary care with musculoskeletal symptoms do not have BJI, our findings highlight the need for continued clinical vigilance in young children, even when classic signs such as fever are absent.

The duration of IV antibiotics was long in this cohort, ranging from a median of 6 days for septic arthritis to 14 days for septic arthritis with contiguous osteomyelitis. Overall, 53/171 (31%) had central venous access placement. The preference for IV treatment may reflect historical practice and contribute to longer hospital stay and increase in healthcare costs. Quick et al. showed that implementation of an institutional evidence-based guideline was effective in reducing the duration of IV therapy and central catheter use [10]. Other studies have demonstrated similar benefits of guidelines [11, 12], educational interventions [13, 14] and infectious diseases consultation [15] to promote timely IV to oral transition.

Overall, only half of oral antibiotic doses matched international recommendations. In those below these targets, median doses typically fell within the broad dosing range recommended by the local dosing reference (AMH). Amoxicillin–clavulanate was prescribed below international guideline recommendations in 29 of 30 cases, with a median amoxicillin component of 45–48 mg/kg/day. While this aligns with the AMH [8] recommendation of 45 mg/kg/day for bacterial infections in children aged 2 months to 12 years, it falls short of international guidelines that recommend up to 120 mg/kg/day [5] for BJIs. Two children with relapse (Table 2, Cases 4 and 5), both involving *K. kingae*, were prescribed an amoxicillin component of 48 and 45 mg/kg/day, respectively. Although *K. kingae* is typically susceptible to amoxicillin, fixed-dose amoxicillin–clavulanate formulations may result in underdosing of the amoxicillin component.

For cephalexin, AMH [8] suggests 50 mg/kg/day for bacterial infections, while international BJI guidelines [3–5] recommend

TABLE 2 | Relapse cases following paediatric BJI.

Case	Age (months)	Aboriginal and/or Torres Strait Islander	Primary diagnosis	Organism	Long-term sequelae at 3–6 months	Antibiotic duration IV (IV + PO)	Oral Antibiotic	Dose (mg/kg/day)
1	141	No	Tibia OM	MSSA	Pathological fracture, chronic OM	21 (49)	Flucloxacillin	52[a]
2	33	No	Ankle SA	*Streptococcus pneumoniae*	None	3 (21)	Amoxicillin	69
3	33	Yes	Hip SA	No pathogen	None	2 (21)	Cephalexin	Unknown
4	14	No	Hip SA	*Kingella kingae*	None	5 (24)	Amoxicillin–clavulanate	48[a]
5	24	No	Hip SA	*K. kingae*	Growth arrest	3 (24)	Amoxicillin–clavulanate	45[a]
6	20	No	Sacroiliac SA	No pathogen	None	14 (42)	Cephalexin	72[a]
7	14	No	Knee SA	No pathogen	Unknown follow-up	3 (21)	Cephalexin	100

Abbreviations: IV, intravenous; MSSA, methicillin-sensitive *Staphylococcus aureus*; OM, osteomyelitis; PO, per os (by mouth); SA, septic arthritis.
[a]Dose below guideline recommendation.

TABLE 3 | Management and outcome of paediatric bone and joint infections.

Management	*n* (%)
Operative intervention	126/171 (73.7)
General paediatric review	58/171 (33.9)
Peripherally inserted central catheter insertion	53/171 (31.0)
Paediatric infectious disease consultation	14/171 (8.2)
Duration of antibiotic therapy	*Median (interquartile range) days*
SA ($n=107$)	
Intravenous	6 (4–10)
Intravenous and oral	26 (21–30.5)
Non-vertebral OM ($n=30$)	
Intravenous	6.5 (5–14)
Intravenous and oral	29.5 (21–40.3)
Vertebral OM ($n=11$)	
Intravenous	14 (range 6–28)
Intravenous and oral	42 (range 28–56)
SAOM ($n=23$)	
Intravenous	14 (5.5–23.5)
Intravenous and oral	31 (28–42)
Clinical outcome	*n (%)*
Relapse within 30 days	7/171 (4.1)
Death	0/171 (0)
Functional outcome	*n (%)*
Pain	4/148 (2.7)
Restricted movement	3/148 (2.0)
Growth arrest	3/148 (2.0)
Pathologic fracture	2/148 (1.4)
Chronic osteomyelitis	1/148 (0.7)

75–100 mg/kg/day. This discrepancy may have contributed to lower cephalexin dosing in our cohort. Among the 20 children who received doses below international recommendations, the median dose was 50 mg/kg/day (IQR 46–50). Three relapse cases (Table 2, Cases 3, 6 and 7) were treated with cephalexin. The two cases with documented dosing received 72 and 100 mg/kg/day, respectively. Pharmacokinetic modelling suggests that 45–75 mg/kg/day may be sufficient for organisms with minimum inhibitory concentrations (MICs) of 1–2 mg/L, but up to 135 mg/kg/day may be required for organisms with MIC of 4 mg/L or higher [16].

The narrow range of lower doses prescribed for amoxicillin–clavulanate (45–48 mg/kg/day) and cephalexin (46–50 mg/kg/day) suggests clinicians followed AMH or local paediatric dosing references, rather than international BJI-specific guidelines when prescribing. This highlights discrepancies between the local and international guidance and underscores the need for further prospective evaluation of the impact of oral antibiotic dosing on clinical outcomes.

This study is limited by its retrospective design and the use of discharge codes to identify cases is susceptible to missing cases. Furthermore, our study did not capture key clinical variables that may influence outcomes, including timing and type of surgery, effects of prior antibiotics on diagnostic yield and antibiotic-related adverse effects or compliance. Indications for PICU admission were not consistently documented, limiting our ability to fully characterise illness severity in these cases. These limitations reflect the constraints of retrospective data and highlight areas for future prospective research.

5 | Conclusion

This study describes the current management of paediatric BJI in a regional Australian setting and opportunities for improvement in systematic care. We underscore the diagnostic complexity of BJI in young children, who may present without classic features such as fever, and highlight the disproportionate burden among Aboriginal and Torres Strait Islander children. Despite recommendations, prolonged IV therapy remains common. Finally, oral antibiotic doses frequently aligned with the AMH but were

TABLE 4 | Dosing of commonly prescribed oral antibiotics.

Antibiotic	Weight based dosing known (*N*)	At or above guideline-recommended daily dose (up to maximum daily dose) *n*/*N* (%)	Below recommended dose *n*/*N* (%)	Median daily dose (mg/kg/day) for patients prescribed lower than guideline-recommended dose (IQR)
Flucloxacillin	41	32/41 (78.0%)	9/41 (22.0%)	50 (48–89)
Amoxicillin–clavulanate	30	1/30 (3.3%)	29/30 (96.7%)	45 (42–45)
Cephalexin	32	12/32 (37.5%)	20/32 (62.5%)	50 (46–50)
Amoxicillin	23	21/23 (91.3%)	2/23 (8.7%)	37.5
TMP-SMX	15	14/15 (93.3%)	1/15 (6.7%)	—

Note: Maximum daily doses were derived from the Australian Medicines Handbook (AMH) Children's Dosing Companion (flucloxacillin 4 g) and international guidelines (cephalexin 3–4 g; co-amoxiclav [amoxicillin component] 3 g; amoxicillin 3–6 g; trimethoprim 320 mg) [3–5, 8].
Abbreviations: IQR, interquartile range; TMP-SMX, trimethoprim-sulfamethoxazole.

often lower than international recommendations. These findings highlight the need to harmonise antibiotic dosing resources and strengthen prescriber support. We also emphasise the importance of prospective studies to optimise dosing in children and evaluate the impact on outcomes.

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Ethics Statement

The study was approved by the Hunter New England Human Research Ethics Committee (AU202201-09).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Figure S1:** Study flow diagram. **Table S1:** Incidence of BJI by year, age group, and proportion relative to total paediatric admissions at the study institution. **Table S2:** Skeletal distribution of infection. **Table S3:** Microbiology of bone and joint infections.