MUSCULOSKELETAL INFECTION PATHWAY

INPATIENT

Concern for Musculoskeletal Infection (MSI)

Has there been any MSI workup initiated?

Yes

No

For initial management, refer to MSI Initial Evaluation Pathway

Is there an effusion?

Yes

Discuss case with Orthopedic Surgery to determine need for advanced imaging and/or surgical intervention

Obtain Urgent MRI

• Manage off Pathway
• Consider discussion with Orthopedic Surgery to determine need for advanced imaging and/or surgical intervention

• Infectious Disease Consult

No

Is there an effusion?

Yes

No

Consult Orthopedic Surgery

Perform Joint Aspiration

Send synovial fluid for cell count, gram stain, and culture; ONLY if 6 months to <5 years, send Kingella PCR

What was synovial fluid WBC count?

< 25K

> 25K

Are blood cultures persistently positive?

Yes

Prepare for PICC placement for prolonged IV antibiotic therapy

• Refer to PICC/TMC Insertion & Removal policy

No

Are there any additional cultures? 

Yes

No

Discharge Criteria:

• Clinically improving (well appearing, weight-bearing if allowed, improved pain and range of motion)
• Normal temperature for 24 hours
• Normal white blood cell count
• Normal CRP/ESR
• Normal chemistry panel
• Home health available
• Normal hematocrit

Inclusion Criteria:

• >6 months old

Exclusion Criteria:

• Postoperative infection or foreign bodies
• Infections from penetrating trauma
• Chronic infections (>2 weeks)
• Medically complex children

Examples of inclusion diagnosis for pathway:

• Septic arthritis
• Pneumonia
• Pyomyositis

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• Septic arthritis
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Pathways are intended as a guide for practitioners and do not indicate an exclusive course of treatment nor serve as a standard of medical care. These pathways should be adapted by medical providers, when indicated, based on their professional judgement and taking into account individual patient and family circumstances.

ChildrensOmaha.org/Pathways

Updated 12/2022

While inpatient, the following labs should be obtained Q48H:

• CBC
• CRP
• Chem 8 (BMP)

Prepare labs, imaging, drainage and/or cultures as indicated

• Consider modifying antibiotic regimen in collaboration with Infectious Disease

Consistent alternative diagnosis

Patient improving as expected?

Yes

Discharge patient if criteria met

No

Revise labs, imaging, drainage and/or cultures as indicated

• Follow-up appointments arranged

• Orthopedic Surgery

• Infectious Disease

• Family understands illness, importance of medication adherence, and follow up; family has ability to contact specialists with questions and/or concerns

If patient improving as expected?

Yes

• Coordinate surgical intervention if needed*
• Begin antibiotic therapy if additional cultures are not forthcoming
• Consult Infectious Disease

No

• Prepare for PICC placement for prolonged IV antibiotic therapy

• Refer to PICC/TMC Insertion & Removal policy

* Coordinate MRI time and/or surgical time with Orthopedic Surgery, Radiology, and OR scheduling prior to exam being ordered

While inpatient:

• Continue post-operative care per Orthopedic Surgery (if procedure performed)
• Modify antibiotic based on culture & sensitivity results (refer to table below)
### Intravenous Antimicrobials

<table>
<thead>
<tr>
<th>Cefazolin (First line)</th>
<th>Vancomycin (First line if history of MRSA or has MRSA risk factors)</th>
<th>Ampicillin</th>
<th>Ceftriaxone</th>
<th>Clindamycin*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dosing</strong> (mg/kg/dose)</td>
<td><strong>33.3 mg/kg/dose</strong> (septic joint) 50 mg/kg/dose (osteo) Q8H</td>
<td><strong>15-20 mg/kg/dose</strong> Q6H</td>
<td>50 mg/kg/dose Q6H</td>
<td>75 mg/kg/day Q24H 10-13.33 mg/kg/dose Q8H</td>
</tr>
<tr>
<td><strong>Daily maximum dosing for MSI</strong></td>
<td><strong>2,000 mg/dose Q8H</strong></td>
<td><strong>2,000 mg/dose Q8H</strong></td>
<td>2,000 mg Q6H</td>
<td>2,000 mg Q24H 900 mg Q8H</td>
</tr>
<tr>
<td><strong>Organism</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSSA</td>
<td>++</td>
<td>+</td>
<td>-</td>
<td>+/-</td>
</tr>
<tr>
<td>MRSA</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>+/-</td>
</tr>
<tr>
<td>S. pyogenes (Group A strep)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>S. pneumoniae</td>
<td>+</td>
<td>+/-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Kingella kingae (&lt;5yr)*</td>
<td>++</td>
<td>+/-</td>
<td>+</td>
<td>+/-</td>
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**Labs**

Monitor for infection resolution and side effects

| Q48H: CBC with diff, CRP, ESR, BUN, Creatinine |

*Clindamycin should only be used if susceptibilities are known. If patient <5 years, clindamycin does not routinely cover K. kingae. Oral bioavailability for clindamycin is >90%.

**Oral Antimicrobials**

<table>
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<th>Clindamycin*</th>
<th>Amoxicillin</th>
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<tr>
<td><strong>Dosing</strong> (mg/kg/dose)</td>
<td><strong>33.3-50 mg/kg/dose TID</strong></td>
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**Labs**

Monitor for infection resolution and side effects

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*a. 23% of MSSA and 18% of MRSA isolates are resistant to clindamycin. Clindamycin should only be used if susceptibilities are known. If patient <5 years, clindamycin does not routinely cover K. kingae. Oral bioavailability for clindamycin is >90%.

*b. Kingella kingae can cause bone and joint infection in patients from 6 months to 5 years of age but is difficult to culture. PCR-based testing can increase yield for K. kingae identification. K. kingae predominantly causes septic arthritis but can also cause isolated osteomyelitis and tenosynovitis; it generally has a milder presentation than S. aureus. Unless microbial cause is known, K. kingae should be empirically covered in children <5 years.