MUSCULOSKELETAL INFECTION PATHWAY

INPATIENT

Concern for Musculoskeletal Infection (MSI)

- Make NPO and place IV if needed

Has there been any MSIs workup initiated?

- Yes
  - If US or MRI have been completed (if neither, 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
      
    - No
      - Consider discussion with Orthopedic Surgery to determine need for advanced imaging and/or surgical intervention
      - Infectious Disease Consult

  - No
    - Monitor and follow up

Has US OR MRI been completed? (If neither, refer to MSI Initial Evaluation Pathway)

- Yes
  - Is there an effusion?
    - Yes
      - Manage off Pathway
      - Consider discussion with Orthopedic Surgery to determine need for advanced imaging and/or surgical intervention
      
    - No
      - Manage off Pathway
      - Consult Infectious Disease

- No
  - Obtain Urgent MRI
  
  - Are blood cultures persistently positive?
    - Yes
      - Continue post-operative care per Orthopedic Surgery (if procedure performed)
      - Modify antibiotic therapy based on culture & sensitivity results (refer to table below)
    
    - No
      - Prepare for PICC placement for prolonged IV antibiotic therapy
      - Refer to PICC/TMC Insertion & Removal policy

- Is patient improving as expected?
  - Yes
    - Discharge patient if criteria met
    
  - No
    - Discharge Criteria:
      - Clinically improving (well-appearing, weight-bearing if allowed, improved pain and range of motion)
      - Tolerating oral intake
      - Afebrile for at least 24 hours
      - Decreasing CRP
      - Bacteremia cleared (if initially present)
      - Home therapy arranged:
        - Medications
        - Home health (if necessary)
        - Surveillance labs
        - Follow-up appointments arranged:
          - Orthopedic Surgery
          - Infectious Disease
        - Family understands illness, importance of medication adherence, and follow up plan; family has ability to contact specialists with questions and/or concerns

Examples of inclusion diagnosis for pathway:
- Septic arthritis
- Osteomyelitis
- Pyomyositis

Inclusion Criteria:
- Predisposing factors
  - Fracture or dislocation
  - Foreign body
  - Infection from penetrating trauma
  - Chronic infections (juvenile)
  - Medically complex children

Exclusion Criteria:
- Postoperative infection or foreign bodies
- Infectious from penetrating trauma
- Chronic infections (juvenile)

While inpatient, the following labs should be obtained Q48H:
- CBC
- CRP/ESR
- Chem 8 (BMP)
## MUSCULOSKELETAL INFECTION PATHWAY

### INPATIENT

#### Intravenous Antimicrobials

<table>
<thead>
<tr>
<th>Dosing (mg/kg/dose)</th>
<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>Clindamycinα</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSSA</td>
<td>++</td>
<td>+</td>
<td>-</td>
<td>+/α</td>
<td>+/α</td>
</tr>
<tr>
<td>MRSA (Group A strep)</td>
<td>+/α</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>S. pneumoniae</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Kingella kingae (&lt;5yr)b</td>
<td>++</td>
<td>+/α</td>
<td></td>
<td></td>
<td>+/α</td>
</tr>
</tbody>
</table>

#### Labs

Monitor for infection resolution and side effects

<table>
<thead>
<tr>
<th>O48H: CBC with diff, CRP, ESR, BUN, Creatinine</th>
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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 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.

#### Oral Antimicrobials

<table>
<thead>
<tr>
<th>Dosing (mg/kg/dose)</th>
<th>Cephalaxin</th>
<th>Vancomycinα</th>
<th>Amoxicillin</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.3-50 mg/kg/dose TID</td>
<td>10-13.33 mg/kg/dose TID</td>
<td>30 mg/kg/dose TID</td>
<td></td>
</tr>
<tr>
<td>Daily maximum dosing for MSI</td>
<td>1,333 mg/dose TID</td>
<td>900 mg/dose TID</td>
<td>1,000 mg TID</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Organism</th>
<th>Cephalaxin</th>
<th>Clindamycinα</th>
<th>Amoxicillin</th>
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<tr>
<td>MSSA</td>
<td>+</td>
<td>+/α</td>
<td></td>
</tr>
<tr>
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<td>+/α</td>
<td>+/α</td>
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</tr>
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<td>S. pneumoniae</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Kingella kingae (&lt;5yr)b</td>
<td>+</td>
<td>+/-</td>
<td></td>
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