## Content Category: Musculoskeletal/Sports Medicine

### Session Topic: Joint Infection/Septic Arthritis

<table>
<thead>
<tr>
<th>Educational Format</th>
<th>Faculty Expertise Required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REQUIRED</strong></td>
<td></td>
</tr>
<tr>
<td>Interactive Lecture</td>
<td>Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&amp;A during the final 15 minutes of the session are required.</td>
</tr>
<tr>
<td><strong>OPTIONAL</strong></td>
<td></td>
</tr>
<tr>
<td>Problem-Based Learning (PBL)</td>
<td>Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. Please describe your interest and plan for teaching a PBL on your proposal form.</td>
</tr>
</tbody>
</table>

### Professional Practice Gap

- There exists statistically significant and meaningful gaps in the medical skill necessary to provide optimal diagnosis and management of joint infections/septic arthritis
- While rare, fungal osteomyelitis and fungal septic arthritis may be difficult to diagnose and eradicate
- Diagnosis can pose a considerable challenge in the primary care setting because most inflamed joints are not septic; and having the time and expertise to tap a joint is often lacking.
- Intraarticular white blood cell cutoff values for infection as low as 1,100 per mm3 (1.10 \times 10^9 per L) with a neutrophil differential of greater than 64 percent can help

### Learning Objective(s) that will close the gap and meet the need

1. Recognize when a joint must be tapped and when you can treat for problems such as gout without tapping the joint.
2. Use appropriate laboratory test values in the assessment of septic arthritis.
3. Recognize the role of imaging studies in the diagnosis of osteomyelitis.
4. Evaluate the risks and benefits of oral antibiotics.
5. Counsel patients with recurrent infections about decolonization regimens.

### Outcome Being Measured

Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.
ACGME Core Competencies Addressed (select all that apply)

| X | Medical Knowledge | Patient Care |
| Interpersonal and Communication Skills | Practice-Based Learning and Improvement |
| Professionalism | Systems-Based Practice |

Faculty Instructional Goals

Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.

- Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations
- Facilitate learner engagement during the session
- Address related practice barriers to foster optimal patient management
- Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the References section below are a good place to start
  - Visit [http://www.aafp.org/journals](http://www.aafp.org/journals) for additional resources
  - Visit [http://familydoctor.org](http://familydoctor.org) for patient education and resources
- Provide updates on new treatment therapies, changes to therapies, or warnings associated with existing therapies. Provide recommendations regarding new FDA approved medications; including safety, efficacy, tolerance, and cost considerations relative to currently available options. Include relevant FDA REMS education for any applicable medications.
- Provide recommendations for recognizing when a joint must be tapped and when you can treat for problems such as gout without tapping the joint.
- Provide recommendations regarding the appropriate laboratory test values in the assessment of septic arthritis.
- Provide recommendations regarding the role of imaging studies in the diagnosis of osteomyelitis.
- Provide recommendations regarding the risks and benefits of oral antibiotics.
- Provide strategies and resources for counseling patients with recurrent infections about decolonization regimens.

Needs Assessment

Data from the 2015 National Ambulatory Medical Care Survey indicates that a diagnosis of pain in a joint of the lower leg in nearly 3 million family medicine office visits, and a diagnosis of joint pain in the shoulder region in over 1.5 million family medicine office visits.\(^1\) Infection is a common etiology of knee pain. Infection of the knee joint may occur in patients of any age but is more common in those whose immune system has been weakened by cancer, diabetes mellitus, alcoholism, acquired immunodeficiency syndrome, or corticosteroid therapy.\(^2\) The incidence of
Septic arthritis ranges widely, between four and 29 cases per 100,000 person-years, and depends on population variables and preexisting structural joint abnormalities. In fact, there are some studies that among persons presenting with acute joint pain and a predisposing condition, 10% had septic arthritis. Gonococcal arthritis is the most common type of nontraumatic acute monoarthritis in young, sexually active persons in the United States.

Data from a recent American Academy of Family Physicians (AAFP) CME Needs Assessment survey indicate that family physicians have statistically significant and meaningful gaps in the medical skill necessary to provide optimal diagnosis and management of joint infections/septic arthritis. A review of the literature suggests the following knowledge and practice gaps:

- Diagnosis can pose a considerable challenge in the primary care setting because most inflamed joints are not septic; and having the time and expertise to tap a joint is often lacking.
- A hot, red joint may represent early manifestation of a systemic disease.
- Pitfalls in the diagnosis and early treatment of acute monoarthritis include failure to perform arthrocentesis, administering antibiotics before aspirating the joint when septic arthritis is suspected (or failing to start antibiotics after aspiration), and starting treatment based solely on laboratory data, such as an elevated uric acid level.
- Fungal osteomyelitis and fungal septic arthritis may be difficult to diagnose and eradicate, especially in the setting of total joint arthroplasty. Although there is no clear consensus on treatment, guidelines are available for management of many of these pathogens.

Physicians may improve their care of patients with a joint infection by engaging in continuing medical education that provides practical integration of current evidence-based guidelines and recommendations into their standards of care, including, but not limited to the following:

- Radiography is not necessary for an accurate diagnosis of monoarthritis in the absence of trauma or focal bone pain.
- Analysis of synovial fluid distinguishes infectious and inflammatory causes of acute monoarthritis from noninflammatory causes.
- Gouty arthritis may be diagnosed without synovial fluid analysis using a diagnostic rule.
- Disseminated gonococcal infections may not result in septicemia or positive synovial fluid cultures; therefore, cultures should be obtained from the potentially infected mucosal site.
- Inflammatory synovial fluid containing monosodium urate crystals, particularly in the presence of podagra, is highly suggestive of gout.
- Erythrocyte sedimentation rate and C-reactive protein level are more useful for following a disease course than discriminating the presence or absence of the disease in patients with monoarthritis.
- Suspicion of septic arthritis should be pursued with arthrocentesis, and synovial fluid should be sent for white blood cell count, crystal analysis, Gram stain, and culture.
- In addition to antibiotic therapy, evacuation of purulent material is necessary in patients with septic arthritis; arthrocentesis and surgical methods are appropriate.
- Intraarticular white blood cell cutoff values for infection as low as 1,100 per mm3 (1.10 x 109 per L) with a neutrophil differential of greater than 64 percent can help diagnose prosthetic joint infection.
The preferred diagnostic criterion for osteomyelitis is a positive bacterial culture from bone biopsy in the setting of bone necrosis.

Magnetic resonance imaging is as sensitive as and more specific than bone scintigraphy in the diagnosis of osteomyelitis.

Parenteral followed by oral antibiotic therapy is as effective as long-term parenteral therapy for the treatment of chronic osteomyelitis in adults.

In a child with a limp and no localized pathology on clinical examination, plain radiography of both lower extremities should be performed.

If localized pathology is suggested on clinical examination, anteroposterior and lateral radiography of the affected areas should be performed.

Ultrasonography is recommended over plain radiography for detecting hip effusions because of its high sensitivity.

Bone scintigraphy is recommended for detecting underlying pathology when history, physical examination,

The following clinical features make septic arthritis more likely than transient synovitis: oral temperature more than 101.3°F (38.5°C), refusal to bear weight on the affected leg, erythrocyte sedimentation rate more than 40 mm per hour, peripheral white blood cell count more than 12,000 per mm3 (12 × 109 per L), or C-reactive protein level more than 20 mg per L (180.96 nmol per L).

These recommendations are provided only as assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations. These recommendations are only one element in the complex process of improving the health of America. To be effective, the recommendations must be implemented. As such, physicians require continuing medical education to assist them with making decisions about specific clinical considerations.

References