Septic arthritis, also known as infectious arthritis, is a severe type of orthopedic infection. It occurs when bacteria, mycobacteria, fungi, or viruses infect an articulating joint, causing inflammation of the synovial membrane and accumulation of purulent fluid within the joint capsule.

**SEPTIC ARTHRITIS**
- **Septic arthritis is a medical emergency** which, if not treated rapidly, can lead to irreversible damage to the joint resulting in significant disability and an increased risk of death.
- Septic arthritis most commonly affects young children, the elderly, anyone with an artificial joint or existing joint disease, and immunocompromised people.

**CAUSES AND CLINICAL PRESENTATION OF SEPTIC ARTHRITIS**

- Septic arthritis is caused by bacteria, mycobacteria, fungi and, less commonly, viruses.

**PATHOGENS CAN ENTER THE JOINT VIA THREE ROUTES**
- **From another infection in the body via the blood stream (most common)**
- **From a penetrating injury or during surgery**
- **Spread from an infection in adjacent bone or soft tissues (skin, muscles, etc.)**

**THE BURDEN OF SEPTIC ARTHRITIS**

Joint infections represent a heavy health and economic burden for patients and society, and prosthetic joint infections are particularly costly to treat.

**NATIVE SEPTIC ARTHRITIS**
- 6-10 new cases/year/100,000 population
- 84% admitted to hospital
- ~2.5% mortality rate during hospitalization
- 55% discharged to skilled care facility or require home health care
- Cost = $759 million

**PROSTHETIC JOINT INFECTION**
- Number of arthroplasties rising in developed countries
- Examples of infection rates:
  - 2.2% US
  - 0.85% Germany
  - 1.41% Finland
  - 0.76% Taiwan
- Estimated combined costs >$1.85 billion by 2030 in US

**BIOMÉRIEUX**

- **Healthy Knee Joint**
- **Native Septic Arthritis of Knee Joint**
- **Prosthetic Knee Joint Infection**

**PATHOGENS** e.g., *Staphylococcus aureus*, *Escherichia coli*
A positive synovial fluid culture is the only definitive diagnosis. Blood culture bottles are frequently used to increase the sensitivity of synovial fluid culture. Likely pathogens correlate with time since surgery. Diagnosis is criteria-based and various organizations have published slightly different criteria. Presence of a sinus tract is a common, definitive criteria. In addition to synovial fluid analysis/culture, blood tests, and radiologic evaluation: Multiple peri-prosthetic tissue biopsies are obtained for histopathology and culture. Sonicate fluid culture (useful for detecting biofilm-producing organisms). Two or more positive cultures with the same organism are recommended to differentiate a true infection from a contamination.
TREATMENT STRATEGIES

NATIVE SEPTIC ARTHRITIS 2.11

- **Surgery** to drain the infection and wash out the joint
- **Antibiotics** are usually given for 3 – 6 weeks, based on susceptibility testing when available or local resistance patterns and trends.

PROSTHETIC JOINT INFECTION 1.4,11-13,16

Along with antibiotics and drainage, a decision must be made in regard to **retaining vs removing/replacing the prosthesis**. While this treatment decision is not standardized, the table below lists different options and their considerations.

<table>
<thead>
<tr>
<th>SURGICAL OPTIONS</th>
<th>CONSIDERATION</th>
<th>TREATMENT / PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DAIR</strong>*</td>
<td>Presentation &lt;30 days</td>
<td>ATBX** (e.g., Rifampin + Fluoroquinolone) x 2-6 weeks</td>
</tr>
<tr>
<td><strong>One-Stage Replacement Arthroplasty</strong> (More common in hip)</td>
<td>No sinus tracts</td>
<td>Remove and replace prosthesis</td>
</tr>
<tr>
<td></td>
<td>Healthy patient and soft tissue</td>
<td>ATBX Impregnated cement</td>
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<tr>
<td></td>
<td>Prolonged ATBX use</td>
<td>IV*** ATBX x 4-6 weeks</td>
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<td></td>
<td>No bone graft</td>
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<tr>
<td></td>
<td>Low-virulence organism with good ATBX sensitivity</td>
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</tr>
<tr>
<td><strong>Two-Stage Replacement Arthroplasty</strong></td>
<td>Gold standard for infected joint &gt;4 weeks</td>
<td>Remove prosthesis ➔ ATBX spacer ➔ IV ATBX x 4-6 weeks ➔ new prosthesis implanted</td>
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<td></td>
<td>Must be medically fit for multiple surgeries</td>
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<td>Requires adequate bone stock</td>
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<tr>
<td><strong>Resection Arthroplasty</strong></td>
<td>Poor bone and soft tissue quality</td>
<td>Remove infected tissue and hardware without reimplantation</td>
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<td></td>
<td>Recurrent infection with MDR**** organism</td>
<td>Joint fused</td>
</tr>
<tr>
<td><strong>Unfit for Surgery</strong></td>
<td>Refuse surgery</td>
<td>Suppressive ATBX</td>
</tr>
</tbody>
</table>

* DAIR: Debridement, antibiotics and implant retention; **ATBX: Antibiotics; ***IV: Intravenous; ****MDR: Multi-drug resistant.

References: