Advisory Statement

Recommendations for the Use of Intravenous Antibiotic Prophylaxis in Primary Total Joint Arthroplasty

Background

Surgical site infections (SSI) are a major source of postoperative illness, accounting for nearly 25% of all nosocomial infections in the United States each year. The Centers for Disease Control and Prevention (CDC) estimate that approximately 500,000 SSIs occur annually in the United States. The risks for patients who develop SSIs include:

- 60% more likely to spend time in an intensive care unit
- Five times more likely to be readmitted to the hospital
- Twice the mortality rate as patients without wound infections.

Studies have demonstrated that prophylactic antibiotics reduce the incidence of infection after orthopaedic surgery in patients without known infection and their use is considered routine for primary total joint arthroplasty.

The National Surgical Infection Prevention Project (SIPP) was initiated in August of 2002 as a joint venture between the Centers for Medicare & Medicaid Services (CMS) and the CDC. By promoting the appropriate selection, timing, and duration of administration of prophylactic antibiotics, the project seeks to reduce the morbidity and mortality related to postoperative infections in the Medicare population. Experts in surgical infection prevention, hospital infection control, and epidemiology developed three performance measures for national surveillance and quality improvement. The American Academy of Orthopaedic Surgeons (AAOS) was instrumental in developing the following three measures: 1) the proportion of patients who receive prophylactic antibiotics consistent with current recommendations; 2) the proportion of patients who receive antibiotic prophylaxis within one hour before the surgical incision; and 3) the proportion of patients whose prophylactic antibiotics were discontinued within 24 hours of the end of surgery.

Preliminary data from this surveillance indicates that antibiotic prophylaxis is not always administered in a manner that is supported by scientific evidence. Inappropriate use of antibiotics does not prevent post-operative infections, but contributes to antibiotic resistance, increases the risk of adverse reactions, predisposes the patient to infections, and increases healthcare costs.

The American Academy of Orthopaedic Surgeons (AAOS) recommends the following evidence-based
practices for the appropriate use of intravenous antibiotic prophylaxis in primary total joint arthroplasty to reduce the risk of infection.

Recommendation 1

*The antibiotic used for prophylaxis should be carefully selected, consistent with current recommendations in the literature, taking into account the issues of resistance and patient allergies.*

Currently, cefazolin or cefuroxime are the preferred antibiotics for patients undergoing orthopaedic procedures. 9, 10, 11, 12 Clindamycin or vancomycin may be used for patients with a confirmed ß-lactam allergy. Vancomycin may be used in patients with known colonization with methicillin resistant *Staphylococcus aureus* (MRSA) or in facilities with recent MRSA outbreaks. 13 In multiple studies, exposure to vancomycin is reported as a risk factor in the development of vancomycin-resistant enterococcus (VRE) colonization and infection. Therefore, vancomycin should be reserved for the treatment of serious infection with ß-lactam-resistant organisms or for treatment of infection in patients with life-threatening allergy to ß-lactam antimicrobials. 14

Recommendation 2

*Timing and dosage of antibiotic administration should optimize the efficacy of the therapy.*

Prophylactic antibiotics should be administered within one hour prior to skin incision. 15, 16, 17, 18, 19 Due to an extended infusion time, vancomycin should be started within two hours prior to incision. If a proximal tourniquet is used, the antibiotic must be completely infused prior to the inflation of the tourniquet. Dose amount should be proportional to patient weight; for patients >80 kg the doses of Cefazolin should be doubled. 20 Additional intraoperative doses of antibiotic are advised if:

1. The duration of the procedure exceeds one to two times the antibiotic's half-life.
2. There is significant blood loss during the procedure. 10, 21, 22

The general guidelines for frequency of intraoperative administration are as follows 13:

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Frequency of Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefazolin</td>
<td>Every 2-5 hours</td>
</tr>
<tr>
<td>Cefuroxime</td>
<td>Every 3-4 hours</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>Every 3-6 hours</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>Every 6-12 hours</td>
</tr>
</tbody>
</table>

Recommendation 3

*Duration of prophylactic antibiotic administration should not exceed the 24-hour post-operative period.*

Prophylactic antibiotics should be discontinued within 24 hours of the end of surgery. 9-12, 23, 24, 25, 26, 27, 28,
Medical literature does not support the continuation of antibiotics until all drains or catheters are removed and provides no evidence of benefit when they are continued past 24 hours.

References


© June 2004 American Academy of Orthopaedic Surgeons
This material may not be modified without the express written permission of the American Academy of Orthopaedic Surgeons.

Doc. No.: 1027

For additional information, contact the Public and Media Relations Department, (847)384-4030