FOR COMMENT

This measure was developed through a collaborative effort between the ASA and ASRA. Please provide your comments related to this clinical performance measure via survey, found here.

The public comment survey period will close on October 9, 2017 at 5pm CT.

Measure Title
Infection Control Practices for Open Intervventional Pain Procedures

Measure Description

Percentage of patients, regardless of age, who undergo an open interventional pain procedure for whom ALL of the following infection control best practices are followed by anesthesiologist(s) and scrub technologist(s), in addition to standard sterile technique:

1. Double gloving (two pairs of sterile gloves are worn)
2. Chlorhexidine with alcohol used
3. Weight-based preoperative antibiotic dosing and, if indicated by procedure duration, weight-based re-dosing
4. Administration of pre-operative antibiotics within 1 hour, or 2 hours for vancomycin, prior to surgical incision (or start of procedure if no incision is required)

NQS Domain
Patient Safety

Measure Type
Process

High Priority Status
Yes

Denominator
All patients, regardless of age, who undergo an open interventional pain procedure

Denominator Exclusions
- None

Numerator

Patients for whom ALL of the following infection control best practices are followed in addition to standard sterile technique:

1. Double gloving (two pairs of sterile gloves are worn)
2. Chlorhexidine with alcohol used
3. Weight-based preoperative antibiotic dosing and, if indicated by procedure duration, weight-based re-dosing
4. Administration of pre-operative antibiotics within 1 hour, or 2 hours for vancomycin, prior to surgical incision (or start of procedure if no incision is required)
Numerators Note:
Weight-based antibiotic dosing and pre-operative antibiotic timing should be performed in accordance with the below Neurostimulation Appropriateness Consensus Committee (NACC) Recommendations:

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Standard intravenous dosing</th>
<th>Timing prior to incision</th>
<th>Redosing interval</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cefazolin**</td>
<td>1 g ≤ 80 kg</td>
<td>Within 30-60 min</td>
<td>3-4 hours (CrCl &gt; 50 ml/min)</td>
<td>First-line</td>
</tr>
<tr>
<td>2 g &gt; 80 kg</td>
<td>6 hours (CrCl 20-50 ml/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 g ≥ 120 kg</td>
<td>16 hours (CrCl &lt; 20 ml/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cindamycin</td>
<td>600 mg ≤ 80 kg</td>
<td>Within 30-60 min</td>
<td>6 hours (CrCl &gt; 50 ml/min)</td>
<td>β-lactam allergy</td>
</tr>
<tr>
<td>900 mg &gt; 80 kg</td>
<td>12 hours (CrCl 20-50 ml/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200 mg &gt; 120 kg</td>
<td>18 hours (CrCl &lt; 20 ml/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vancomycin</td>
<td>1 g ≤ 80 kg</td>
<td>Within 1.5 hr</td>
<td>None (CrCl &lt; 20 ml/min)</td>
<td>Known MRSA colonization</td>
</tr>
<tr>
<td>2 g &gt; 80 kg</td>
<td>6 hours (CrCl 20-50 ml/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 g ≥ 120 kg</td>
<td>18 hours (CrCl &lt; 20 ml/min)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Modified from Bottles et al. 89, Alexander et al. 90, and Bottles et al. 91.
**In an effort to simplify cefazolin weight-based dosing, the American Society of Health-System Pharmacists (ASHP) recommends 2 g for individuals weighing ≤ 120 kg and 3 g for individuals weighing > 120 kg, MRSA, methicillin-resistant S. aureus; CrCl, creatinine clearance.


Rationale
Infections associated with open interventional pain procedures are associated with significant morbidity and healthcare costs. For implantable pain therapies, the reported infection rates range from 1 to 10%. Two large systematic reviews on spinal cord stimulation report infection rates of 3.4 to 4.6%. The infection rates reported for implantable pain therapies are often higher than those associated with other implantable therapies including total joint replacement and cardiac pacemakers. In the field of interventional pain medicine practice deficiencies have been identified. A recent international survey of 506 physicians examining infection control practices for spinal cord stimulation highlighted the need for education. The survey demonstrated a low compliance rate for infection control recommendations that have been recommended by the Centers for Disease Control, the National Institute for Health and Care Excellence (NICE) and a Surgical Care Improvement Project. Only four of the 15 recommended practices surveyed demonstrated a greater than or equal to 80% compliance rates. Areas of deficiency included weight-based antibiotic dosing, hair removal strategies, double gloving, surgical dressing, skin antiseptic agent selection and inappropriate postoperative continuation of antibiotics. The compliance rates for weight-based dosing of antibiotics (47%; 95% CI: 42.6% – 51.4%), utilization of double gloving (47.8%; 95% CI: 43.4% – 52.2%), and utilization of chlorhexidine gluconate (67.7%; 95% CI: 63.6% – 71.8%) were all less than 70%.

The consequences associated with infections for implantable pain therapies and open interventional pain procedures can be devastafiting. For implantable pain therapy infections, the implantable device often must be removed. In addition, many patients lose therapy and are not re-implanted. A recent review of 2737 surgical site infections associated implantable pain therapies demonstrated that 77.6% were explanted. A recent review of claims-based data on spinal cord stimulator implants demonstrated that only 27% of patients were re-implanted and that the cost of a surgical site infection was approximate $59,000. Therefore, a surgical site infection with an implantable pain therapies is not only costly but often results in the end of the therapy. A recent analysis of the United States Anesthesia Close Claims project database examining injury and liability associated with implantable pain therapies from 1990 to 2013, demonstrated that infection was the most common damaging event. Infection represented 23% of all claims.

A recent publication on quality improvement for spinal cord stimulation infection demonstrated a significant reduction in surgical site infection rates when evidence based practices were implemented. Infection rates went from 10.4% to 1% following implementation of best practices.
Clinical Recommendation Statements

2016 Neurostimulation Appropriateness Consensus Committee (NACC) Recommendations for Infection Prevention and Management

“The NACC recommends maximal sterile barrier precautions as well as double gloving for implantation of implantable pain devices.”

“The NACC recommends the use of chlorhexidine-based products combined with isopropyl alcohol for skin preparation prior to neuromodulation procedures.”

“For antimicrobial therapy to be effective, the serum and tissue levels of the agent must exceed the minimum inhibitory concentrations (MIC) prior to incision and throughout the operation. In order to exceed MIC, customized weight-based dosing is needed for each individual.”

2008 NICE Surgical site infections: prevention and treatment clinical guidelines

“Consider wearing two pairs of sterile gloves when there is a high risk of glove perforation and the consequences of contamination may be serious.”

“Prepare the skin at the surgical site immediately before the incision using an antiseptic (aqueous or alcohol-based) preparation: povidone-iodine or chlorhexidine are most suitable.

2016 WHO Surgical Site Infection Prevention Guidelines

“The panel suggests that either sterile, disposable, non-woven or sterile, reusable woven drapes and surgical gowns can be used during surgical operations for the purpose of preventing SSI. (conditional recommendation, moderate to very low quality of evidence).”


