Intraoperative Spinal Instrumentation Infection Prevention
Evidence-Informed Pathway

CHG Wipe at Home

IV access and 
Central lines for patients with neuromuscular (NM) scoliosis when necessary

Intubation

Arterial line placed

Neuromonitoring anterior leads placed and connected - Clean leads and skin before connecting

Foley placed

Neuromonitoring posterior leads placed and connected - Clean leads and skin before connecting

Skin Prep

Betadine scrub > towel dry > chloraprep > 3 min drying > ioban drape
*do not drag corners across incision/ wound

Physicians gowned and gloved

Check for:
- Level 3 surgical gown
- Sizing/ coverage
- Frequency of changing: 3 hrs

Time out

Incision

Allograft bone soaked in abx for NM

Medications given to backfield
Thrombin 5,000 units to gel foam and/or Surgiflo

Autograft bone collected and chopped throughout the case

Cefazolin re-dose every 4 hours during the procedure
ALL antibiotics re-dosed with profound blood loss (>25 mL/kg)

Wound irrigation (by hand or pulsavage)

Bacitracin 50,000 units AND/OR Betadine 3 min soak

Allo and autograft is placed along with vancomycin powder 1 - 2g for children >25kg

Wound closed

Outer gloves changed

Dressing applied with Dermabond tape or silver impregnated dressing
NM: Mud flap applied

Infection Protocol form completed (all patients)

NM transferred to PICU and PCU
Idiopathic and all others transferred to floor

Dressing changed 3rd post-op day

Throughout entire case:
- Temperature of room 68-73°F
- Relative humidity 30-60%
- OR attire (Click box for policy)
- Use forced air warming blankets and individual patient use fluid warmers for all continuous IV fluids administered to ensure patient remains normothermic
- Limit room traffic and minimize frequency and duration doors are open in order to maintain room positive pressure

Inclusion Criteria:
Patients undergoing spinal instrumentation surgery for scoliosis

Exclusion Criteria:
None
Critical Points of Evidence

Evidence Supports

- Administer cefazolin at a dose of 30 mg/kg up to a maximum dose of 2 grams for patients under 120 kg, and 30 mg/kg up to a maximum dose of 3 grams for patients over 120 kg. (1-3) – Strong recommendation, very low quality evidence
- Use 1-2 grams of vancomycin powder sprinkled in the surgical wound prior to closure to prevent surgical site infection in children that weigh >25kg. (4-10) – Strong recommendation, very low quality evidence
- To provide coverage for gram negative pathogens for incontinent pediatric patients by administering gentamicin at a dosing of 2.5 mg/kg with a maximum dose of 120 mg (2, 11-14) – Strong recommendation, very low quality evidence
- To use drains in pediatric patients undergoing spinal instrumentation surgery for scoliosis (3, 15-17) – Strong recommendation, very low quality evidence

Evidence Lacking/Inconclusive

- Irrigation by hand compared to pulsovage to decrease surgical site infection. (13, 18-20) – Unable to make a recommendation
- Use of 50,000 units of bacitracin and/or a three minute povidone-iodine soak decrease the risk of surgical site infection. (21-22) – Unable to make a recommendation
- To re-dose cefazolin every four hours or with profound blood loss (>25 mL/kg), whichever comes first. – Consensus recommendation
- To administer vancomycin as the prophylactic pre-incision antibiotic in patients with severe penicillin allergy (defined by anaphylaxis) or known cephalosporin allergy. – Consensus recommendation
References


Clinical Standards Preparation
This clinical standard was prepared by the Evidence-Based Outcomes Center (EBOC) team in collaboration with content experts at Texas Children’s Hospital. Development of this clinical standard supports the TCH Quality and Patient Safety Program initiative to promote clinical standards and outcomes that build a culture of quality and safety within the organization.

Intraoperative Spinal Instrumentation Infection Prevention
Content Expert Team
Judith Campbell, MD, Infectious Disease
Darrell Hanson, MD, Orthopaedic Surgery
Andrew Jea, MD, Neurosurgery
Kenneth Kocab, RN, Outcomes & Impact Service
Lucia Marquez, MD, Infectious Disease
Debra Palazzi, MD, Infectious Disease
Nihar Patel, MD, Anesthesiology
Ruston Taylor, PharmD, Pharmacy
Imelda Tjia, MD, Anesthesiology
Veronica Velez, RN, Surgery
Elaine Whaley, MSN, RN, Infection Control
Darrell Hanson, MD, Orthopaedic Surgery

EBOC Team
Christine Procido, MPH, Research Specialist
Karen Gibbs, MSN/MPH, RN, Research Specialist
Ellis Ajmend, MD, MM, PhD Associate Medical Director
Charles Macias, MD, MPH, Medical Director

Additional EBOC Support
Tom Burke, Research Assistant
Sherin Titus, Research Assistant
Andrea Jackson, MBA, RN, Research Specialist
Jennifer Loveless, MPH, Research Specialist
Sheesha Porter, MS, RN, Research Specialist
Anne Dykes, MSN, RN, Assistant Director
Kathy Carberry, MPH, RN, Director

No relevant financial or intellectual conflicts to report.

Development Process
This clinical standard was developed using the process outlined in the EBOC Manual. The literature appraisal documents the following steps:
1. Review Preparation
   - PICO questions established
   - Evidence search confirmed with content experts
2. Review of Existing External Guidelines
   - Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery, Surgical Site Infection: Prevention and Treatment of Surgical Site Infection
3. Literature Review of Relevant Evidence
   - Searched: PubMed, Cochrane Library, Google Scholar
4. Critically Analyze the Evidence
   - 1 meta-analysis, 4 randomized controlled trials, 19 nonrandomized studies
5. Summarize the Evidence
   - Materials used in the development of the clinical standard, literature appraisal, and any order sets are maintained in an Intraoperative Spinal Instrumentation Infection Prevention evidence-based review manual within EBOC.

Evaluating the Quality of the Evidence
Published clinical guidelines were evaluated for this review using the AGREE II criteria. The summary of these guidelines are included in the literature appraisal. AGREE II criteria evaluate Guideline Scope and Purpose, Stakeholder Involvement, Rigor of Development, Clarity and Presentation, Applicability, and Editorial Independence using a 4-point Likert scale. The higher the score, the more comprehensive the guideline.

Intraoperative Spinal Instrumentation Infection Prevention
Consistent evidence from well-performed RCTs or observational studies indicates there is sufficient evidence to support and refute an intervention and no conclusion can be drawn from the evidence.

The GRADE criteria were utilized to evaluate the body of evidence used to make practice recommendations. The table below defines how the quality of the evidence is rated and how a strong versus weak recommendation is established. The literature appraisal reflects the critical points of evidence.

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<thead>
<tr>
<th>Quality</th>
<th>Type of Evidence</th>
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<tr>
<td>High</td>
<td>Consistent evidence from well-performed RCTs or exceptionally strong evidence from unbiased observational studies</td>
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<tr>
<td>Moderate</td>
<td>Evidence from RCTs with important limitations (e.g., inconsistent results, methodological flaws, indirect evidence, or imprecise results) or unusually strong evidence from unbiased observational studies</td>
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<tr>
<td>Low</td>
<td>Evidence for at least 1 critical outcome from observational studies, RCTs with serious flaws or indirect evidence</td>
</tr>
<tr>
<td>Very Low</td>
<td>Unsystematic clinical observations or very indirect evidence</td>
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Recommendations
Practice recommendations were directed by the existing evidence and consensus amongst the content experts. Patient and family preferences were included when possible. The Content Expert Team and EBOC team remain aware of the controversies in the prevention of infection from intraoperative spinal instrumentation in children. When evidence is lacking, options in care are provided in the clinical standard and the accompanying order sets (if applicable).

Approval Process
Clinical standards are reviewed and approved by hospital committees as deemed appropriate for its intended use. Clinical standards are reviewed as necessary within EBOC at Texas Children’s Hospital. Content Expert Teams are involved with every review and update.

Disclaimer
Practice recommendations are based upon the evidence available at the time the clinical standard was developed. Clinical standards (guidelines, summaries, or pathways) do not set out the standard of care and are not intended to be used to dictate a course of care. Each physician/practitioner must use his or her independent judgment in the management of any specific patient and is responsible, in consultation with the patient and/or the patient’s family, to make the ultimate judgment regarding care.

Version History
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<th>Date</th>
<th>Action</th>
<th>Comments</th>
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<td>Originally completed</td>
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