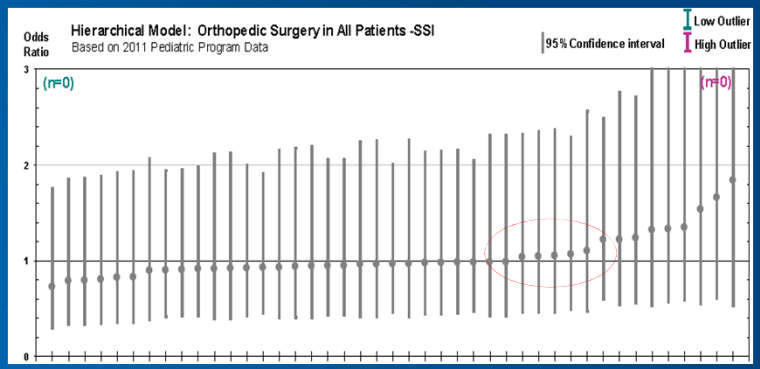
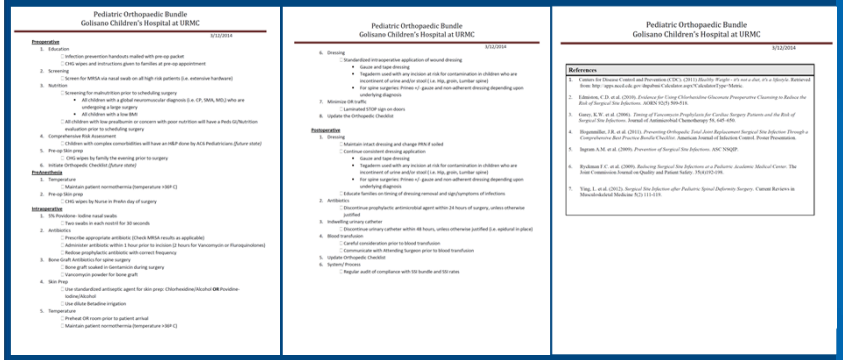
Utilizing ACS NSQIP Data To Develop A Pediatric Orthopedic Bundle

Kori Wolcott, Julie Michels, James Sanders
Golisano Children's Hospital, Rochester, NY

Introduction: In the ACS NSQIP semi-annual reports representing the 2011 and 2012 data, Golisano Children's Hospital Orthopedic spine data indicated a surgical site infection rate that was higher than most of the comparison hospitals. As a result of this data a Pediatric Surgery Quality Improvement Group was organized and the NSQIP data analyzed. Orthopedic patients at high risk for developing a surgical site infection were identified and the process of developing an Orthopedic bundle was initiated.





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Preoperative
1. Education
   - ☐ Infection prevention handouts mailed with pre-op packet
   - ☐ CHG wipes and instructions given to families at pre-op appointment
2. Screening
   - ☐ Screen for MRSA via nasal swab on all high risk patients (i.e. extensive hardware)
3. Nutrition
   - ☐ Screening for malnutrition prior to scheduling surgery
     - All children with a global neuromuscular diagnosis (i.e. CP, SMA, MD,) who are undergoing a large surgery
     - All children with a low BMI
   - ☐ All children with low prealbumin or concern with poor nutrition will have a Peds GI/Nutrition evaluation prior to scheduling surgery
4. Comprehensive Risk Assessment
   - ☐ Children with complex comorbidities will have an H&P done by ACS Pediatricians *(future state)*
5. Pre-op Skin prep
   - ☐ CHG wipes by family the evening prior to surgery
6. Initiate Orthopedic Checklist *(future state)*

Postoperative
1. Temperature
   - ☐ Maintain patient normothermia (temperature >36º C)
2. Pre-op Skin prep
   - ☐ CHG wipes by Nurse in PreAn day of surgery

Intraoperative
1. 5% Povidone- Iodine nasal swabs
   - ☐ Two swabs in each nostril for 30 seconds
2. Antibiotics
   - ☐ Prescribe appropriate antibiotic (Check MRSA results as applicable)
   - ☐ Administer antibiotic within 1 hour prior to incision (2 hours for Vancomycin or Fluroquinolones)
   - ☐ Redose prophylactic antibiotic with correct frequency
3. Bone Graft Antibiotics for spine surgery
   - ☐ Bone graft soaked in Gentamicin during surgery
   - ☐ Vancomycin powder for bone graft
4. Skin Prep
   - ☐ Use standardized antiseptic agent for skin prep: Chlorhexidine/Alcohol **OR** Povidine-Iodine/Alcohol
   - ☐ Use dilute Betadine irrigation
5. Temperature
   - ☐ Preheat OR room prior to patient arrival
   - ☐ Maintain patient normothermia (temperature >36º C)

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6. Dressing
   - Standardized intraoperative application of wound dressing
     - Gauze and tape dressing
     - Tegaderm used with any incision at risk for contamination in children who are incontinent of urine and/or stool (i.e. stjg, groin, Lumbar spine)
     - For spine surgeries: Prineo +/- gauze and non-adherent dressing depending upon underlying diagnosis
7. Minimize OR traffic
   - ☐ Laminated STOP sign on doors
8. Update the Orthopaedic Checklist

Postoperative
1. Dressing
   - ☐ Maintain intact dressing and change PRN if soiled
   - ☐ Continue consistent dressing application
     - Gauze and tape dressing
     - Tegaderm used with any incision at risk for contamination in children who are incontinent of urine and/or stool (i.e. stjg, groin, Lumbar spine)
     - For spine surgeries: Prineo +/- gauze and non-adherent dressing depending upon underlying diagnosis
   - ☐ Educate families on timing of dressing removal and sign/symptoms of infections
2. Antibiotics
   - ☐ Discontinue prophylactic antimicrobial agent within 24 hours of surgery, unless otherwise justified
3. Indwelling urinary catheter
   - ☐ Discontinue urinary catheter within 48 hours, unless otherwise justified (i.e. epidural in place)
4. Blood transfusion
   - ☐ Careful consideration prior to blood transfusion
   - ☐ Communicate with Attending Surgeon prior to blood transfusion
5. Update Orthopaedic Checklist
6. System/ Process
   - ☐ Regular audit of compliance with SSI bundle and SSI rates

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Results: The Pediatric Orthopedic Bundle was initiated March 17, 2014. Auditing took place over 3 months and was completed June 17, 2014. The audit included all cases performed by our two Pediatric Orthopedic surgeons. The Pediatric Orthopedic SSI rate is trending down with no SSI's identified since initiation of the bundle. Bundle compliance is communicated with the surgeon that is the champion of the bundle.

Methods: Once our NSQIP data was analyzed and presented to The Pediatric Surgery Quality Improvement Group, the development of our Pediatric Orthopedic Bundle began. Our Orthopedic bundle includes pre-op nutrition screening and treatment (if necessary) , Chlorhexidine baths for all patients included in the trial, maintenance of normothermia, proper antibiotic prophylaxis with dosing/redosing parameters, use of Gentamycin/Vancomycin powder on bone grafts, specific dressings (Prineo)for high risk patients, use of Chloroprep/Alcohol & dilute Betadine irrigation for skin prep, and reduction of OR traffic.

Conclusions: Use of ACS NSQIP data allows for the identification of high risk patients and areas for improvement. As we have had success in decreasing the SSI rate with the use of the Orthopedic Bundle, the use of the bundle will continue. Parts of this bundle are currently being rolled out to the other pediatric surgery divisions.