Implementation of Best Practice to Reduce Cesarean Section Surgical Site Infection

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GOAL

To decrease the rate of cesarean section surgical site infection.


• 100% women requiring cesarean section will have pre-operative antibiotics
• 100% women requiring cesarean section will have Hibiclens skin prep applied
• 100% women with hair removal by clippers versus shaving
• 100% compliance or OB OR environment rounds
**Background**

- Rising cesarean section rate in the United States at 31.8%
- Most common surgical procedures in the United States.
- Complex patients at a higher risk for SSI post-operatively
- Currently, there are no best practice SSI bundles for cesarean section patients although SSI rates and costs are increasing in healthcare care organizations (Sievert et. al., 2011).
• Cesarean delivery rates decreased more than 5% among births at 38 weeks of gestation, but increased 4% among births at 39 weeks.

• Decreases in cesarean delivery rates for births at 38 weeks occurred for non-Hispanic white, non-Hispanic black, and Hispanic women, as well as for all maternal age groups.

• Increases in cesarean delivery rates for births at 39 weeks occurred among non-Hispanic white, non-Hispanic black, and Hispanic women, as well as for all maternal age groups.

• The cesarean delivery rate at 38 weeks decreased in 30 states; the cesarean delivery rate at 39 weeks increased in 23 states.

The singleton birth cesarean delivery rate increased from 1998 to 2009 but was stable from 2009 to 2011.

Figure 1. Cesarean delivery, by gestational age: United States, final 1996–2010 and preliminary 2011

NOTES: Singletons only. Early preterm is less than 34 weeks of gestation; late preterm is 34–36 weeks; early term is 37–38 weeks; full term is 39–40 weeks. Access data table for Figure 1 at: http://www.cdc.gov/nchs/data/databriefs/db124_tables.pdf#1.


Keywords: race and Hispanic origin • National Vital Statistics System
Preventing Health Care and Community Acquired Infections

The 2013 FREE Online Reference GUIDE to PREVENTING INFECTIONS

LATEST UPDATE FROM THE CDC:
Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE)

Stay informed with the latest techniques and procedures to prevent healthcare associated infections. Access the most current Guidelines and educational media from the CDC to help you deliver safest care to your patients. Important information includes how to treat Neutropenia as well as free hospital tools like posters and videos from the One and Only Campaign.

Also, CDC Guidelines for:
- Preventing Intravascular Catheter-Related Infections
- Preventing Infections In Cancer Patients
- Preventing Infections In Dialysis Patients
- Preventing Infections In Outpatient Settings

In support of President Obama’s Partnership for Patients, the Healthcare and Patient Partnership Institute (H2Pi) has created a FREE guide for hospitals that address important areas of focus for 2013.

Learn how healthcare providers and patients and families can work together to affect safer delivery of care, help realize better expected medical outcomes, reduce risk and liability, reduce medical costs and advance an authentic culture of safety throughout the U.S.

(Click here to access the FREE guides)

http://www.safecarecampaign.org/SSI.html
CDC Recommendations

- Identify and treat all remote infections before surgery
- Clip hair around incision site: No shaving
- Avoid hyperglycemia; Encourage no smoking
- Have patient shower or bathe with antiseptic the night before surgery
- Protect with sterile dressing 24-48 hours
- Standardize antimicrobial prophylaxis - discontinue with 24 hrs after surgery end time
- Decrease OR traffic – keep OR door closed
C/S SSI 2008 and 2009

March 2009 – ChloraPrep start in OB OR
Gained IRB approval in December 2009 to retrospectively identify risk factors that might contribute to the incidence of SSIs.

Identified risk factors (intrinsic and extrinsic), to develop a best practice model related to pre-operative education, peri-operative interventions, and post-operative incision care for the perinatal population.

<table>
<thead>
<tr>
<th>P (Patient population)</th>
<th>Cesarean Section patients &gt; 37 weeks</th>
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</thead>
<tbody>
<tr>
<td>I (Intervention or Treatment)</td>
<td>Surgical hygiene, antibx tx, and clipping</td>
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<tr>
<td>C (Compared to)</td>
<td>No surgical hygiene, BMI &gt; 30, no antibx tx, hours of labors with ROM</td>
</tr>
<tr>
<td>O (Outcome of interest)</td>
<td>Decreased surgical site infections</td>
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</tbody>
</table>
1. Risk factors examined did not have a significant correlation.
2. Closure method had no significance in SSIs.
3. Antibiotic timing prior to incision may have affected rate in April and May 2010.
4. Non emergent C/S had a high frequency at 92.1% versus 7.9% for emergent delivery.
5. Culture sources from patient’s incision indicate that the patient’s own skin flora was a contaminant.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Statistical Significance</th>
<th>Risk Factor for SSI</th>
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<tbody>
<tr>
<td>Race</td>
<td>P=.57</td>
<td>No</td>
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<tr>
<td>Primigravida</td>
<td>P=.57</td>
<td>No</td>
</tr>
<tr>
<td>BMI</td>
<td>P=.825</td>
<td>No</td>
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<tr>
<td>Non Emergent vs. Emergent</td>
<td>P=.106</td>
<td>No</td>
</tr>
<tr>
<td>GBS</td>
<td>P=.52</td>
<td>No</td>
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<tr>
<td>Closure method</td>
<td></td>
<td></td>
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<tr>
<td>Staple vs. Suture</td>
<td>P=.70</td>
<td>No</td>
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<tr>
<td>Prep: Betadine vs. Cholraprep</td>
<td>P=.54</td>
<td>No</td>
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TEAM

Reduction of C/S SSI

Chief of OB

Women’s Services, Service Line Director

Clinical Staff

Clinical Nurse Specialist

Infection Control Preventionist

Clinical Informatics Analyst

Clinical Managers
D (define) - Reduction of Cesarean Section Surgical Site Infections

M (measurement) - Numerator-Patients with C/S SSI
Denominator-Patients without C/S SSI

A (analysis) Determine current state of C/S SSIs and identify risk factors that make obstetrical patients more susceptible to infection.

I (improvement) – Interventions were implemented in a step-wise method to determine which interventions made an impact. Simultaneously, a retrospective chart review was conducted to identify any patient risk factors to determine the rise in SSI.

C (control) - Review of data via trend charts and spreadsheets in clinical staff meetings, OB OR Subcommittee meetings composed of nursing champions, and OB Physician monthly meetings. Interventions were discussed and revised as needed. Patient education via antepartum inpatient stays, postpartum education for wound care, as well as childbirth education classes were revised.
Best Practice Interventions

Centers of Disease Control and Prevention and the Institute of Healthcare Improvement that are referenced in several research and clinical practice journals.

Antibiotic prophylaxis pre-operatively and chlorhexidine gluconate (Hibiclens) bathing pre-operatively played a significant role in decreasing the SSI rate along with the following:

• review of aseptic technique and traffic with staff and physicians
• sterilization and disinfection of OB OR rooms
• hair removal with clippers
• patient education pre-operatively and post-operatively for incision care
Feb 2010 OB-OR IC sub committee
March 2010 Staff & MD education
April 2010 OB Order sets revised with abx prophylaxis and OB-OR surgical improvements to OR surgical environment
Aug 2010 1. Hibiclens bathing began and 2. Further improvements to environment
Sept 2010 ChloraPrep Skin Prep Education & Circ Prep
Studies demonstrate that antisepsis with chlorhexidine gluconate decrease the incidence of surgical site infection more effectively than traditional skin preps such as povidine-iodine (Dariouche et. al., 2011).
2012-2013

- CHG brush to replace CHG bottle pre-wash in rooms - May
- Pre-operative shower – 3 days prior and the morning of surgery with CHG - May
- Standardized education sheet for CHG shower for all surgeries – May
- Preoperative C/S education Class – started in July but poor attendance
C/S SSI 2012 and 2013

Apr 2013 - CHG for Scheduled C/S Patients
CHG Brush Pre-op in Room

May 2013 - CHG RSFH standardized Pre-op pt education

July 2013 C/S Pre-Op class for scheduled

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<th>Jan</th>
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Savings of $728,000

Cost of cesarean section with complications (average South Carolina Hospital Charge) = $20,800

2008: 4 C/S SSIs X $20,800 = $83,200
2009: 8 C/S SSIs X $20,800 = $166,400
2010: 11 C/S SSIs X $20,800 = $228,800
2011: 2 C/S SSI X $20,800 = $41,600
2012: 6 C/S SSI X $20,800 = $124,800
2013: 4 C/S SSI X $20,800 = $83,200
• To hold the gain of zero SSIs with implemented best practices and standardization of surgical protocols for cesarean section deliveries.
• Continued surveillance and improvements in the OB OR environment.
• Hibiclens C/S Skin Prep protocol and C/S SSI prevention for two OB OR units system wide.
• Development of C/S SSI Prevention Bundle that would reduce healthcare costs for the perinatal population.

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<tr>
<th>Year</th>
<th>YTD</th>
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<tbody>
<tr>
<td>2008</td>
<td>0.79%</td>
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<tr>
<td>2009</td>
<td>1.3%</td>
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<td>2010</td>
<td>2.55%</td>
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<td>2011</td>
<td>0.34%</td>
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<tr>
<td>2012</td>
<td>0.91%</td>
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<tr>
<td>2013</td>
<td>0.54%</td>
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Thank You!
References


