CHAIN SSI Bundle: Targeting and Slashing SSI Rates

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Surgical Site Infection: Who Knows Your Dirt?

- CDC/NHSN (National Healthcare Safety Network)
- CMS (Center for Medicare & Medicaid Services)
- NSQIP (National Surgical Quality Improvement Project)
- MHA (MN Hospital Association)
- Patients

Readmissions, complications and deaths

Patients who are admitted to the hospital for treatment of medical problems sometimes get other serious injuries, complications, or conditions, and may even die. Some patients may experience problems soon after they are discharged and need to be admitted to the hospital again. These events can often be prevented if hospitals follow best practices for treating patients.

- 30-Day outcomes: Readmission and death rates
- Surgical complications
- Healthcare-associated infections
- American College of Cardiology percutaneous coronary intervention (PCI) readmission measure

In the tables, you can hear the footnote number to see the footnote text. View more footnote details.
Why Care About SSIs?

- It’s the right thing to do
  - Patient benefit
  - Maintain clinical prominence

- Institutional health
  - “Meaningful use”
  - Optimize value of care
  - Pay for Performance 2015 based on 2013 performance
SSI SIR by HEN: Abdominal Hysterectomy: Q2 2012 (NHSN Data)

Hospital Engagement Network (HEN) – 26 networks, nationwide
Goal: To advance the patient safety work associated with the Affordable Care Act
SSI SIR by HEN: Colon Surgery Q2 2012 (NHSN Data)

* Indicates that the HEN SIR is statistically different from the estimated national PfP average at \( p < .05 \)
SSI – Hospital compare data reflecting one year of rolling quarters, Q3 2011 – Q2 2012:

- Colon surgeries:
  - MN SIR 0.760 (National 0.821)

- Abdominal hysterectomy
  - MN SIR 1.640 (National 0.977)
• To develop an action plan and design a tool kit for Minnesota hospitals to improve SSI rates for all surgeries, beginning with the following strategies:
  — Review abdominal hysterectomy SSI cases to identify:
    – Proportions of known risk factors for SSI
    – Areas for improvement
  — Develop recommendations for care during:
    – Preop (example: preop bathing)
    – Intraop (example: closing pans)
    – Postop (example: wound care)
SSI Subgroup Representation

- Mayo Clinic
- Allina Health
- Regions Hospital
- Essentia Health Duluth
- University of Minnesota Medical Center
- District One Hospital
- Park Nicollet Methodist Hospital
- North Memorial Medical Center

Multi-Institutional, multi-disciplinary: A Team Effort
SSI subgroup designed a template to guide chart abstraction for AH SSI cases Q1 2012 – Q2 2013

- Patient-related and perioperative variables assessed
- Descriptive
- 66 cases
# Patient Demographics

## Abdominal Hysterectomy (N=66)

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<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
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<tbody>
<tr>
<td><strong>ASA Score</strong></td>
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</tr>
<tr>
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<td>7</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
<td>53</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>22</td>
<td>33</td>
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<tr>
<td>4</td>
<td>2</td>
<td>3</td>
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<tr>
<td><strong>Smoker</strong></td>
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<tr>
<td><strong>Yes</strong></td>
<td>16</td>
<td>24</td>
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<tr>
<td><strong>Immuno-suppressed</strong></td>
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<td>33</td>
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<td>36</td>
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<tr>
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<tr>
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<td>80</td>
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<td>12</td>
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<table>
<thead>
<tr>
<th><strong>Surgery Type</strong></th>
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<tbody>
<tr>
<td>Open</td>
<td>17</td>
<td>26</td>
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<tr>
<td>Robotic</td>
<td>5</td>
<td>8</td>
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<tr>
<td>Laparoscopic</td>
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<td>24</td>
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<tr>
<td>Combination</td>
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<td>24</td>
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<tr>
<td>Other</td>
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<table>
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<tr>
<th><strong>Indication for surgery</strong></th>
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<tbody>
<tr>
<td>Benign</td>
<td>32</td>
<td>48</td>
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<tr>
<td><strong>Malignant</strong></td>
<td>29</td>
<td>44</td>
</tr>
<tr>
<td>Unknown</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>

Only 10% of SSI cases had normal BMI

Abdominal Hysterectomy SSI Chart Review
Preliminary Findings (66 cases)

- Hair removal occurred in OR for 80% of cases (16) for which hair removal was performed (56% cases did not have hair removed)
- Suture for closure in 94% cases
- Least common mode of hyst in SSI chart review: Robotic
  - Some of what we don’t know:
    - How often total v. supracervical (ie. More like a class I wound) performed in MN robotic cases
    - Proportion of laparoscopic cases converted to open (yet coded as scope)
  - Higher proportion of SSIs in open hyst suggests: Cross-contamination between vagina and sterile sites (pelvic organ/space, fascia, skin) may be occurring

Spontaneous Progress? Or Not?

SSI Colon Surgeries Standardized Infection Ratio (SIR)
Q2 2012-Q1 2013
Hospital Compare December 2013

Q2 2012 SIR for colon surgeries: 0.99 (v. 0.8 above for Q2 2012-Q1 2013)
Most Recent Data: Colon

SIR SSI after colon surgery among 43 Minnesota HEN hospitals reporting to NHSN
41 (95%) of 43 hospitals reporting 75% increase
(Q1 2012 - Q1 2014)
SSI-Colon Surgery Standardized Infection Ratio (SIR) (NHSN), PfP-Aligned Hospitals (n = 2,614)

Source: NHSN (n = 2,614 to 2,673 HEN-aligned hospitals, depending on the quarter).
Spontaneous Progress? Or Not?

SSI Abdominal Hysterectomy Standardized Infection Ratio (SIR)
Q2 2012-Q1 2013
Hospital Compare December 2013

Q2 2012 SIR for Abdominal Hyst: 1.55 (v. 1.3 above for Q2 2012-Q1 2013)
Most Recent Data: Hysterectomy

SIR SSI after abdominal hysterectomy among 43 Minnesota HEN hospitals reporting to NHSN
40 (93%) of 43 hospitals reporting 38% decrease
(Q1 2012 - Q1 2014)
Slashing SSI in MN: Recommendations

Summary of recommendations as of August 20\textsuperscript{th}, 2014:

- CHAIN SSI Reduction Bundle
- For all surgeries performed in the OR that involve a skin incision
- Patients of all ages

- Based on data/recommendations from: CDC, HICPAC, SHEA, AORN, IDSA, Joint Commission, ACS
1. Preop Showering/Bathing (CDC, HICPAC, SHEA, AORN)

- Patients to shower or bathe (full body) with either soap or antiseptic agent x1 the evening before and x1 the morning of surgery
- In preop, an FDA-approved antiseptic solution should be applied in full strength to the operative site
- Assessment of adherence to home showering should be assessed upon preop admission
- If patient was unable to do at home, an antiseptic shower, bath or full body wipe is to be done in preop
- Hospital inpatients requiring surgery should have an antiseptic shower, bath, or full body wipe prior to surgery if possible
2. Postop Wound Care (AORN, CDC, TJC ACS)

- Preop patient education on importance of hand hygiene in preventing SSI
- Hand hygiene products will be provided at the patient bedside
- Sterile surgical dressings are to be left intact 24 – 48 hours unless there is bleeding or other indication to remove
- If postop dressing changes are necessary, sterile gloves and dressings should be used
3. Closing Trays (AORN)

- For all class II+ wounds, including extracorporeal bowel anastomoses, fresh/clean instruments, irrigation, and gloves/gowns are to be utilized for wound closure.

- The need for closing trays is to be added to the preoperative briefing or timeout script.
Example closing pan contents:

4 Kocher/straight clamps
2 6-inch Mayo Haeger needle drivers
2 8-inch Mayo Haeger needle drivers
1 medium DeBakey forceps
1 pick-up with teeth
2 Adson forceps
2 bowel pickups
1 short Metzenbaum scissors
1 long suture scissors
2 two-prong retractors

Cost for 4 closing pans in GYN surgery-- $3,033.35
Mayo Clinic Closing Protocol (GYN)

Closing protocol (all members of the scrubbed OR team)

1. Discuss in preop briefing
2. Steps to assure hemostasis, abdominal irrigation, etc completed with instruments from original surgical pan
3. When ready to close fascia, all instruments from original surgical pan removed from field
4. If drains to be placed, place AFTER opening the closing pan
5. All scrubbed change gloves and gowns
6. Closing pan opened
7. New electrocautery opened (if cautery needed during closure)
8. Field re-blocked/toweled off with new towels
4. Antibiotic Dosing  (IDSA)

- Weight-based dosing of preoperative abx per AHSP/SHEA guidelines
- Intra-operative re-dosing abx when procedure lasts longer than two half-lives of the drug
- Intra-operative re-dosing abx when procedure involves EBL>1500cc (consider same for pediatric equivalent of EBL)
5. Glycemic control (HICPAC, CDC)

- Perioperative glycemic control with blood glucose target < 200 mg/dL for diabetic and non-diabetic patients

6. Normothermia (HICPAC)

- Maintain normothermia (body temperature ≥ 36°C or 96.8°F) preoperatively, intraoperatively and postoperatively
7. Perioperative Oxygenation

- Maintain oxygenation at >92% or at chronic, accepted patient baseline throughout the perioperative period
  - Postoperatively through PACU stay

8. OR Traffic

- Assessment of OR traffic with the intent to reduce unnecessary traffic, performed upon implementation of SSI bundle and periodically thereafter
Does an SSI Reduction Bundle Work?

- Multi-disciplinary
  - Nursing, Anesthesia, Surgeons, Residents/Fellows, Infection Control, patients, families

- Colorectal surgery @ Mayo
  - SSI reduction bundle
  - Overall SSI baseline 9.4% → 4% after bundle
  - Superficial incisional SSI: dropped to 1.5% (even in setting of bowel resection)

- GYN surgery @ Mayo...

Mayo Clinic SSI reduction “Bundle” ---- Preop Intraop Postop ---- Initiative started July 29, 2013

Mayo IPAC report: All GYN surgery cases with type II wound included
CMS/Medicare report (30-day SSI): Hysterectomies performed through open (laparotomy), scope, or robot

### SSI SIR - ABDOMINAL HYSTERECTOMY

**Rochester Methodist Hospital/ Saint Marys Hospital**

<table>
<thead>
<tr>
<th>YR/QTR</th>
<th>Procedure Count</th>
<th>Infection Count</th>
<th>Number Expected</th>
<th>SIR</th>
<th>SIR p-value</th>
<th>95% Confidence Interval</th>
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<tbody>
<tr>
<td>2014Q1</td>
<td>147</td>
<td>0</td>
<td>1.212</td>
<td>0.000</td>
<td>0.298</td>
<td>2.472</td>
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</table>

2014Q1 and forward, data submitted to CMS will be combined
NSQIP: All GYN surgery cases included, regardless of wound type

GYN IMPROVEMENT 2012-13

Subspecialties 01/01/12 - 12/31/12

Hospital Odds Ratios

SS Gynecology Morbidity
SS Gynecology UTI
SS Gynecology SSI

1.52
1.61
1.59

Outlier and Decile Status

H9 H9 H10

Subspecialties 01/01/13 - 12/31/13

Hospital Odds Ratios

SS Gynecology Morbidity
SS Gynecology UTI
SS Gynecology SSI

0.88
1.39
0.75

Outlier and Decile Status

3 9 2

One Year
SSI Reduction Pilot in Minnesota

- Hennepin County Medical Center
- North Memorial Medical Center
- Cuyuna Regional Medical Center
- Glencoe Regional Health Services
- Grand Itasca Hospital
- Sanford Health Bemidji
And More: Generating National Awareness

- Position statements reflecting the need for better risk adjustment (currently only adjusted for age and ASA score) for AH and colon surgery
- Statements audience: NHSN and CMS
- Noting that obese patients have higher SSI risk
- More complicated (ie. oncologic) AH appear to be higher risk for SSI
And More: Generating National Awareness

- Call for an audit of the adequacy of surveillance
- Call to update the reference/historic data (2006-2008) to allow for more current SIR determination
- Position statements from MN CHAIN SSI Subgroup generated to be shared with national societies (ACS, SGO, etc) for edits and endorsement
Questions?