Surgical Site Infection Prevention Pathway v2.0

Approval & Citation
Summary of Version Changes
Explanation of Evidence Ratings

Surgical Site Infection (SSI) Prevention Bundle Elements:
1) Preoperative bath
2) Appropriate skin antisepsis
3) No hair removal
4) Nasal decolonization
5) Warming
6) Appropriate antibiotics & redosing

Inclusion Criteria
- Bellevue Surgery Center and Main OR

Exclusion Criteria
- Procedures performed in IR, GI, Cath lab, Radiology

Perioperative Warming Measures
(Not applicable to cases where cooling is indicated)
- Patients > six years with a surgery longer than an hour should have active warming (forced air – Main OR only)
- All other patients should be provided with passive warming (warm blanket)

GOC: Perioperative Warming

CHG contraindications/alternate
- CHG not indicated in infants <44 weeks corrected age except for cardiac surgery patients
- For inpatients with CHG allergy bathe with bath wipes or soap and water
- For outpatients with CHG allergy provide family instructions for pre-op dilute bleach bath

Job Aid: CHG Wipes

Implant* Exceptions
include stents in the urinary tract, hormonal implants, trachs, and G-tubes.

Start Here
Surgical skin incision?

Low Risk

Moderate SSI RISK: Skin cleaning & antisepsis
- Night before surgery: Bathe hair and body followed by cleansing with 2% CHG wipes (inpatient) or 4% CHG solution (outpatient)
- Day of surgery: 2% CHG wipe

YES
MRSA?
NO

Moderate SSI Risk

MRSA?
NO

Night before surgery: Bath and shampoo
If patient is MRSA+, no decolonization needed

Cardiac, Neuro, or surgery with implant*

YES

MRSA?
YES

High SSI Risk

HIGH RISK/NO MRSA: Skin cleaning & antisepsis
- Five days prior to surgery: Initiate nasal decolonization with Mupirocin applied in the nostrils 2 times daily
- Two consecutive nights before surgery: Bathe hair and body followed by cleansing with 2% CHG wipes (inpatient) or 4% CHG solution (outpatient)
- Day of surgery: 2% CHG wipes

YES

High Risk

HIGH RISK & MRSA Decolonization: Skin cleaning & antisepsis
- Five days prior to surgery: Initiate nasal decolonization with Mupirocin applied in the nostrils 2 times daily for 5 consecutive days
- Five consecutive nights before surgery: Bathe hair and body followed by cleansing with 2% CHG wipes (inpatient) or 4% CHG solution (outpatient)
- Day of surgery: 2% CHG wipes

P&P: Surgical Antimicrobial Prophylaxis

For questions concerning this pathway, contact:SSIPathway@seattlechildrens.org
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Last Updated: January 2019
Next Expected Review: October 2023
Surgical Site Infection Prevention Pathway v2.0
Nursing Workflow

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SSI Prevention Bundle Element Table

Inclusion Criteria
- Bellevue Surgery Center and Main OR

Exclusion Criteria
- Procedures performed in IR, GI, Cath lab, Radiology

Scheduled Procedure

Ambulatory Clinics
Complete SSI Risk Form

Pre-Procedural phone call
Review or complete SSI Risk Form

Pre-operative area
Review SSI Risk Form
Complete pre-operative assessment form

Unscheduled or Add On Procedure (ED / Inpatient RN)

Scheduled for > 24 hours out
Fill out SSI Risk Form
Get orders for CHG / Mupirocin if indicated
Complete Surgical Checklist within 24 hours before surgery

Scheduled for < 24 hours
Fill out Surgical Checklist including SSI Risk tab
Complete bundle elements as time allows

Pre-Operative SSI Prevention Assessment

Return to SSI Prevention

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Last Updated: January 2019
Next Expected Review: October 2023
## SSI Prevention Bundle Elements Table

### Appendix A: Surgical Site Infection Prevention Bundle Elements

<table>
<thead>
<tr>
<th>SSI Bundle Element</th>
<th>Low Risk</th>
<th>Moderate Risk</th>
<th>High Risk</th>
<th>MRSA Decolonization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No surgical skin incision</td>
<td>Surgical Skin incision</td>
<td>Cardiac, intra-cranial or any surgery with an implant</td>
<td>No action Needed, follow recommendations below</td>
</tr>
<tr>
<td>If your patient is MRSA positive:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin Cleansing: All Patients</td>
<td>No action Needed, follow recommendations below</td>
<td>Ask provider if patient needs MRSA Decolonization</td>
<td>Follow MRSA Decolonization Recommendations</td>
<td>MRSA Decolonization Recommendations Below</td>
</tr>
<tr>
<td>Bath &amp; Shampoo night before</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin Antisepsis: Outpatient 1, 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consecutive Night/s before with 4% CHG Solution</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Day of Surgery with 2% CHG Wipes</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Skin Antisepsis: Inpatient 1, 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consecutive Night/s before with 2% CHG Wipes</td>
<td>N/A</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Day of Surgery with 2% CHG Wipes</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Preoperative Hair Removal: All Patients (shaving, laser, depilatory, waxing)</td>
<td>N/A</td>
<td></td>
<td>No hair removal for 7 days prior to surgery</td>
<td></td>
</tr>
<tr>
<td>Nasal Decolonization: Mupirocin or Povidone Iodine</td>
<td>N/A</td>
<td>N/A</td>
<td>5 consecutive days prior to surgery</td>
<td>5 consecutive days prior to surgery</td>
</tr>
<tr>
<td>Warming Measures: Passive (warm blanket) or Active (forced-air)</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
<td>Yes</td>
</tr>
<tr>
<td>Antibiotic Administration</td>
<td>For detailed information refer to Clinical P&amp;P: Surgical Antimicrobial Prophylaxis</td>
<td></td>
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</tr>
</tbody>
</table>

1 If CHG contraindicated, cleanse skin with Bath wipes or soap and water
2 If CHG contraindicated, bathe with dilute bleach solution (outpatient) or plain soap (inpatient)
3 If successful decolonization documented, defer to provider
4 CHG not indicated in infants <44 weeks corrected age except for cardiac surgery patients.
5 Povidone Iodine not indicated for cardiac surgical patients.

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**Return to Nursing Workflow**
Surgical Site Infection (SSI) Prevention Approval & Citation

Approved by the CSW Surgical Site Infection Prevention Pathway team for October 22, 2018 go live

CSW SSI Pathway Team:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner, Pediatric Orthopedic Surgeon</td>
<td>Jennifer Bauer, MD, MS</td>
</tr>
<tr>
<td>Infectious Disease</td>
<td>Danielle Zerr, MD</td>
</tr>
<tr>
<td>Infection Prevention</td>
<td>Rosemary Martin</td>
</tr>
<tr>
<td>Director, Infection Prevention</td>
<td>Therese Mirisola, RN, MSN, CPON</td>
</tr>
<tr>
<td>Data Analyst</td>
<td>Brendan Bettinger</td>
</tr>
<tr>
<td>Medical Director, Clinical Effectiveness</td>
<td>Darren Migita, MD</td>
</tr>
<tr>
<td>Systems Support Leader</td>
<td>Rachel VanDeMark, BSN, MHA</td>
</tr>
<tr>
<td>Charge Nurse, Perioperative Services</td>
<td>Nancy Deem, RN</td>
</tr>
<tr>
<td>Support Leader, Ambulatory Nursing &amp;</td>
<td>Sarah Storhoff, MSN, RN-BC</td>
</tr>
<tr>
<td>Clinical Support Services</td>
<td></td>
</tr>
<tr>
<td>Nurse Manager, OR Education</td>
<td>Christine Burnett, MSN, RN</td>
</tr>
<tr>
<td>CNS, PACU</td>
<td>Pam Christenson, MN, ACCNS-P, RN-BC</td>
</tr>
<tr>
<td>Unit Based Clinical Quality Leader</td>
<td>Angela Turner, BSN, RN, CPN</td>
</tr>
<tr>
<td>CNS, ED</td>
<td>Elaine Beardsley, BSN, RN, CPN</td>
</tr>
<tr>
<td>Unit Based Clinical Quality Leader, CICU</td>
<td>Colin Crook, RN</td>
</tr>
<tr>
<td>Unit Based Clinical Quality Leader, ICU</td>
<td>Hector Valdivia, MN, RN, CCRN</td>
</tr>
<tr>
<td>Anesthesiologist</td>
<td>Sean Flack, MB, ChB</td>
</tr>
<tr>
<td>Manager, Operative Services</td>
<td>Cindy Katz</td>
</tr>
</tbody>
</table>

Clinical Effectiveness Team:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant(s)</td>
<td>Lisa Abrams, MS, NP</td>
</tr>
<tr>
<td>Project Manager</td>
<td>Jean Popalisky, DNP</td>
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<tr>
<td>CIS Informatician</td>
<td>Pauline O'Hare, RN, MBA</td>
</tr>
<tr>
<td>CE Analyst</td>
<td>Michael Leu, MD, MS, MHS</td>
</tr>
<tr>
<td>CIS Analyst</td>
<td>Holly Clifton, MPH</td>
</tr>
<tr>
<td>Librarian</td>
<td>Maria Jerome</td>
</tr>
<tr>
<td>Program Coordinator</td>
<td>Jackie Morton, MLS</td>
</tr>
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<td></td>
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<tr>
<td>Executive Approval:</td>
<td></td>
</tr>
<tr>
<td>Sr. VP, Chief Medical Officer</td>
<td>Mark Del Beccaro, MD</td>
</tr>
<tr>
<td>Sr. VP, Chief Nursing Officer</td>
<td>Madlyn Murrey, RN, MN</td>
</tr>
<tr>
<td>Surgeon-in-Chief</td>
<td>Bob Sawin, MD</td>
</tr>
</tbody>
</table>


Evidence Ratings

This pathway was developed through local consensus based on published evidence and expert opinion as part of Clinical Standard Work at Seattle Children’s. Pathway teams include representatives from Medical, Subspecialty, and/or Surgical Services, Nursing, Pharmacy, Clinical Effectiveness, and other services as appropriate.

When possible, we used the GRADE method of rating evidence quality. Evidence is first assessed as to whether it is from randomized trial or cohort studies. The rating is then adjusted in the following manner (from: Guyatt G et al. J Clin Epidemiol. 2011;4:383-94.):

Quality ratings are **downgraded** if studies:
- Have serious limitations
- Have inconsistent results
- If evidence does not directly address clinical questions
- If estimates are imprecise OR
- If it is felt that there is substantial publication bias

Quality ratings are **upgraded** if it is felt that:
- The effect size is large
- If studies are designed in a way that confounding would likely underreport the magnitude of the effect OR
- If a dose-response gradient is evident

Guideline – Recommendation is from a published guideline that used methodology deemed acceptable by the team.

Expert Opinion – Our expert opinion is based on available evidence that does not meet GRADE criteria (for example, case-control studies).

**Quality of Evidence:**
- 🌟🌟🌟🌟 High quality
- 🌟🌟🌟 Moderate quality
- 🌟🌟 Low quality
- 🌟 Poor quality
- 🌟🌟🌟🌟 Very poor quality

Guideline
Expert Opinion

Return to SSI Prevention  Return to Nursing Workflow  To Bibliography
Summary of Version Changes

- Version 1.0 (10/22/2018): Go live
- Version 2.0 (01/31/2019): Updated Pre-Operative SSI Prevention Assessment
Medical Disclaimer

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required.

The authors have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication.

However, in view of the possibility of human error or changes in medical sciences, neither the authors nor Seattle Children’s Healthcare System nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such information.

Readers should confirm the information contained herein with other sources and are encouraged to consult with their health care provider before making any health care decision.
Search Methods, Surgical Site Infection Clinical Standard Work

Literature searches were conducted in two phases and executed by a medical librarian, Jackie Morton. The initial search, in December 2017, targeted synthesized literature on surgical site infections. It was executed in Ovid Medline, Cochrane Database of Systematic Reviews, Embase, National Guideline Clearinghouse and TRIP. All searches were limited to items published in English, from 2014 to current. The second search, in January 2018, was conducted in Medline and Embase to retrieve primary studies for 20 years, focusing on nasal decolonization. The team included results from two searches, pre-operative bathing and peri-operative hypothermia, conducted by other clinical support teams. Results were exported to RefWorks for system de-duplication, then to Excel for the screening process.

May 18, 2018

Identification

Records identified through database searching (n= 1123 )

Additional records identified through other sources (n= 0)

Screening

Records after duplicates removed (n=1033)

Records screened (n= 1033)

Records excluded (n= 906)

Eligibility

Records assessed for eligibility (n= 127)

Articles excluded (n= 113)
Did not answer clinical question (n= 24)
Did not meet quality threshold (n= 81)
Outdated relative to other included study (n= 8)

Included

Studies included in pathway (n= 14)

Flow diagram adapted from Moher D et al. BMJ 2009;339:bmj.b2535


