Surgical Site Infections: the role of perioperative staff in minimising risk

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Doherty Institute, Melbourne
Outline

• VICNISS surveillance
• SSI Rates in Victoria
• Preventing SSIs
• Implementing Quality Improvement
Background

• SSIs most common HAI
  • account for ~28% of all HAIs among hospitalised patients

• Each SSI associated with:
  • 7-13 days additional post-op hospital days
  • 2-11 times higher risk of death compared to patients without SSI

• Up to 60% estimated to be preventable by using evidence-based guidelines

VicNISS

- Funded by the Victorian DHHS, est. 2002
- Coordinate HAI surveillance (& related events) in Victoria
- Education & support to participating facilities
- Collate, aggregate & analyse risk-adjusted infection rates
- Reports: hospitals, DHHS, public reporting
- Evaluation & research
- Outbreak investigation/support

- Collaborative relationships: SCV, VAHI, aged-care, private hospitals, professional organisations e.g. ANZSCTS, AOA
VICNISS Surveillance Activity

- Surgical Site Infection
- Surgical Antibiotic Prophylaxis
- Signal Event Surgical Infection (Small hospitals <100 beds only)
- Colorectal Surgery Process Adherence Monitoring
- Central Line Associated Bloodstream Infection
- Peripheral Line Associated Bloodstream Infection (Neonatal Unit only)
- Peripheral Venous Catheter Use Monitoring
- Ventilator Associated Event (Adult ICU only)
- Ventilator Associated Pneumonia (Paediatric ICU only)
- Central Line Insertion Practices Adherence Monitoring
- *Staphylococcus aureus* Bacteraemia
- Carbapenemase-producing Enterobacterales
- *Clostridium difficile* Infection
- Methicillin Resistant *Staphylococcus aureus* (Small hospitals <100 beds only)
- Vancomycin Resistant Enterococcus
- Haemodialysis Event
- National Hand Hygiene Initiative
- Occupational Exposure
- Healthcare Worker Measles Immunity (Small hospitals <100 beds only)
- Healthcare Worker Hepatitis B Immunity (Small hospitals <100 beds only)
- Healthcare Worker Influenza Vaccination
- Resident Pneumococcal Vaccination (Aged care homes only)
- Resident Influenza Vaccination (Aged care homes only)
- Resident Herpes Zoster Vaccination (Aged care homes only)

75 regional public hospitals

45 metropolitan public hospitals

Also:

- 78 private hospitals
- 180 residential aged-care facilities
DHHS Requires SSI Surveillance
SSI Surveillance

• Use of standardised methodology (based on CDC NHSN)
• Analyse data to identify and investigate trends
• Guides the identification of improvement actions
  • evaluate the effectiveness of interventions
• Feedback of SSI rates to relevant stakeholders
VICNISS SSI Surveillance

• VICNISS surgical procedure groups:
  • Hip prosthesis
  • Knee prosthesis
  • Coronary artery bypass graft
  • Colorectal surgery
  • Caesarean section
  • Hysterectomy – abdominal
  • Hysterectomy – vaginal
  • Cardiac surgery
  • Gall bladder surgery
  • Breast surgery
  • Appendix surgery
  • Spinal fusion or refusion
  • Craniotomy
  • Ventricular shunt
  • Small bowel surgery
  • Laminectomy
  • Gastric surgery
  • Fem-pop and fem-tib bypass
  • Abdominal aortic aneurysm

• Data collated on all surgeries that belong to procedure group
  • Patient demographics, procedure details, antibiotic prophylaxis
  • Infection details, pathogen and antimicrobial susceptibilities
Webforms
- Electronic data submission
- Internal validation
- Secure portal, SQL DB
**Definitions**

**Superficial**
- Involves skin & subcutaneous tissue
  - Purulent drainage from wound
  - Positive wound culture
  - Pain, redness or swelling and wound opened by surgeon
  - Diagnosis by surgeon

**Deep**
- Involves deep soft tissues (e.g. muscle, fascia)
  - Purulent drainage from deep aspect of the wound
  - Dehiscence
  - Abscess on exam or imaging

**Organ Space**
- Involves body parts deeper than muscle & fascial levels
  - Purulent drainage from drain in surgical cavity
  - Positive culture of fluid or tissue from cavity
# Victoria Crude SSI Rates (5 year aggregate)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>No of infection</th>
<th>No of procedures</th>
<th>Rate (per 100 procedures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorectal</td>
<td>473</td>
<td>6,976</td>
<td>6.78</td>
</tr>
<tr>
<td>CABG</td>
<td>423</td>
<td>11,377</td>
<td>3.71</td>
</tr>
<tr>
<td>Hip Prosthesis</td>
<td>315</td>
<td>29,244</td>
<td>1.08</td>
</tr>
<tr>
<td>Caesarean Section</td>
<td>420</td>
<td>55,159</td>
<td>0.76</td>
</tr>
<tr>
<td>Knee Prosthesis</td>
<td>190</td>
<td>25,476</td>
<td>0.75</td>
</tr>
</tbody>
</table>
SSI Prevention

SSIs can be prevented using evidence-based strategies
Preventing SSI

• Many factors contribute to the risk of SSI
• Prevention of SSI is complex
  • Requires a range of measures
  • Before, during and after surgery
• Implementation of measures is not standardized worldwide
• No international guidelines
  • National guidelines only
• Nov 2016 World Health Organisation published: Global Guidelines for the Prevention of SSI
### Summary of core topics, research questions and recommendations for the prevention of surgical site infection

<table>
<thead>
<tr>
<th>Topic</th>
<th>Research questions</th>
<th>Recommendations</th>
<th>Strength</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preoperative measures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optimal timing for preoperative SSI</strong></td>
<td>How does the timing of SSI assessment impact on the risk of SSI?</td>
<td>The panel recommends SSI should be assessed prior to the surgical incision, considering the half-life of the antibiotic.</td>
<td>Strong</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Mechanical bowel preparation and the use of oral antibiotics</strong></td>
<td>Is mechanical bowel preparation combined with oral antibiotics effective for the prevention of SSI in colorectal surgery?</td>
<td>The panel recommends preoperative oral antibiotics combined with mechanical bowel preparation should be used to reduce the risk of SSI in adult patients undergoing elective colorectal surgery.</td>
<td>Conditional</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Decolonization with antimicrobial mouthwash</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hair removal</strong></td>
<td>Does hair removal affect the risk of SSI?</td>
<td>The panel recommends that hair removal should be performed prior to surgery.</td>
<td>Strong</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

### Additional recommendations
- **Antimicrobial skin sealants**
- **Enhanced nutritional support**
- **Preoperative discontinuation of immunosuppressive agents**
- **Perioperative oxygenation**

### Conditional/Low Risk
- The panel suggests that antimicrobial skin sealants should not be used after surgical site skin preparation for the purpose of reducing SSI.
- The panel recommends that surgical hand preparation should be performed by scrubbing with either a suitable antimicrobial soap and water or using a suitable alcohol-based hand rub before dicing sterile gloves.
### WHO - Summary of core topics, research questions and recommendations for the prevention of surgical site infection

<table>
<thead>
<tr>
<th>Topic</th>
<th>Research questions</th>
<th>Recommendations</th>
<th>Strength</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preoperative measures</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Maintaining normal body temperatures (normothermia)</strong></td>
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</tr>
<tr>
<td>Does the use of warming devices in the OR and during the surgical procedure for patient body warming with the purpose of reducing SSI?</td>
<td>The panel suggests the use of warming devices in the OR with the purpose of reducing SSI.</td>
<td>Conditional</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td><strong>Use of protocols for intensive perioperative blood glucose control</strong></td>
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</tr>
<tr>
<td>1. Do protocols aiming to maintain optimal perioperative blood glucose levels reduce the risk of SSI?</td>
<td>The panel suggests the use of protocols for intensive perioperative blood glucose control for both diabetic and non-diabetic adult patients undergoing surgical procedures to reduce the risk of SSI.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>2. What are the optimal perioperative blood glucose target levels in diabetic and non-diabetic patients?</td>
<td>The panel did not formulate a recommendation on this topic due to the lack of evidence to answer question 2.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Maintenance of adequate circulating volume control/ normovolemia</strong></td>
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<tr>
<td>Does the use of specific fluid management strategies during surgery affect the incidence of SSI?</td>
<td>The panel suggests the use of goal-directed fluid therapy to reduce the risk of SSI.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Draper and gowns</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1. Is there a difference in SSI rates depending on the use of disposable non-woven drapes and gowns or reusable available drapes and gowns?</td>
<td>The panel suggests that, for sterile, disposable non-woven or sterile, reusable washable drapes and gowns can be used during surgical operations for the purpose of preventing SSI. No specific evidence was reviewed to answer questions 1.1 and 1.2.</td>
<td>Conditional</td>
<td>Moderate to very low</td>
<td></td>
</tr>
<tr>
<td>2. Is there a difference in SSI rates depending on the use of disposable non-woven or reusable washable gowns?</td>
<td>The use of disposable non-woven or reusable washable gowns to reduce the risk of SSI.</td>
<td>Conditional</td>
<td>Low to very low</td>
<td></td>
</tr>
<tr>
<td><strong>Wound protector devices</strong></td>
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<tr>
<td>Does the use of wound protector devices reduce the rate of SSI in open abdominal surgery?</td>
<td>The panel suggests the use of wound protector devices in clean, contaminated, and dirty abdominal surgical procedures for the purpose of reducing the rate of SSI.</td>
<td>Conditional</td>
<td>Very low</td>
<td></td>
</tr>
<tr>
<td><strong>Incisional wound irrigation</strong></td>
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<tr>
<td>Does irrigation with saline or other irrigation methods reduce the risk of SSI?</td>
<td>The panel considers that there is insufficient evidence to recommend for or against saline irrigation of incisional wounds before closure for the purpose of preventing SSI.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>The panel suggests considering the use of irrigation of the incisional wound with an aqueous PVP solution before closure for the purpose of preventing SSI.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
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<tr>
<td><strong>Prophylactic negative pressure wound therapy</strong></td>
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<tr>
<td>Does prophylactic negative pressure wound therapy reduce the rate of SSI compared to the use of conventional dressings?</td>
<td>The panel suggests the use of prophylactic negative pressure wound therapy in adult patients on primarily closed surgical incisions in high-risk wounds for the purpose of preventing SSI while taking resources into account.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Use of surgical gloves</strong></td>
<td></td>
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</tr>
<tr>
<td>1. When is double-gloving recommended?</td>
<td>The panel decided not to formulate a recommendation due to the lack of evidence to assess whether double-gloving or a change of gloves during the operation or the use of specific types of gloves are more effective in reducing the risk of SSI.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>2. What are the criteria for changing gloves during an operation?</td>
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<tr>
<td>3. What type of gloves should be used?</td>
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<tr>
<td><strong>Changing of surgical instruments</strong></td>
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</tr>
<tr>
<td>At the time of wound closure, is there a difference in SSI when instruments are chafed, soiled, contaminated, and dirty closure using a ring set of sterile instruments?</td>
<td>The panel did not decide to formulate a recommendation on this topic due to the lack of evidence.</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td><strong>Antimicrobial-coated sponges</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Are antimicrobial-coated sponges effective to prevent SSI?</td>
<td>The panel suggests the use of antimicrobial-coated sponges for the purpose of reducing the risk of SSI independent of the type of surgery.</td>
<td>Conditional</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td><strong>Laminar flow ventilation systems in the context of OR ventilation</strong></td>
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<td></td>
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</tr>
<tr>
<td>1. Is the use of laminar air flow in the OR necessary for SSI reduction of overall, or deep SSI?</td>
<td>The panel suggests that laminar airflow ventilation systems should not be used to reduce the risk of SSI for patients undergoing total arthroplasty surgery.</td>
<td>Conditional</td>
<td>Low to very low</td>
<td></td>
</tr>
<tr>
<td>2. Does the use of fans or cooling devices decrease SSI?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3. Is natural ventilation an acceptable alternative to mechanical ventilation?</td>
<td></td>
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<tr>
<td><strong>SAP prolongation</strong></td>
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</tr>
<tr>
<td>Does continued postoperative SAP reduce the risk of SSI compared with prophylactic and possibly even intravenous prophylaxis alone?</td>
<td>The panel recommends against the prolongation of SAP after completion of the operation for the purpose of preventing SSI.</td>
<td>Strong</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced dressings</strong></td>
<td></td>
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<tr>
<td>Insurginal patients, should advanced dressings be used for the prevention of SSI?</td>
<td>The panel suggests using any type of advanced dressing over a standard dressing or primarily closed surgical wounds for the purpose of preventing SSI.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Antimicrobial prophylaxis in the presence of a drain and optimal timing for wound drain removal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. In the presence of drains, does prolonged antibiotic prophylaxis prevent SSI?</td>
<td>The panel suggests that prolonged antibiotic prophylaxis should not be continued in the presence of a wound drain for the purpose of preventing SSI. The panel suggests removing the wound drains when clinically indicated. No evidence was found to allow making a recommendation on the optimal timing of wound drain removal for the purpose of preventing SSI.</td>
<td>Conditional</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>2. When using drains, how long should they be kept in place to minimize SSI as a complication?</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Surgical Antimicrobial Prophylaxis (SAP)

- When indicated (depending on the type of operation), surgical antibiotic prophylaxis should be administered prior to the surgical incision.
- Surgical antibiotic prophylaxis should be administered within 120 minutes before incision, while considering the half-life of the antibiotic.
- Prolongation of SAP after completion of the operation for the purpose of preventing SSI is not recommended.

WHO - STRONG recommendation

Australia

- June 2019 Therapeutic Guidelines
  - Antibiotic
    - Surgical antibiotic prophylaxis
Implementation

Summarize
• Do you have local guideline/protocol to assist abx choice, dose, timing? Does it meet National TG?

Identify
• What antibiotics are available on imprest? What does the AMS team monitor?

Measure
• Collect data - Proportion of patients that received correct SAP (choice, dose, timing, re-dosing & duration)

Ensure  (all patients receive intervention)
• Collaborate with stake holders – surgeon, anaesthetist, AMS team, etc.
• Develop strategies to improve:
  • Education
  • Antimicrobial prophylaxis protocol
  • Individual feedback to providers
Example of Data Feedback

SAP Choice Compliance Hip Prosthesis: 2003 - 2019

Summary - Approach to SAP

• Evaluate current use of antibiotics in peri-op setting
• Establish practices consistent with current guidelines for SAP
• Institute process measures to improve antibiotic administration
• Set measurable goals
• Monitor compliance with recommendations
• Feedback the data
Glycaemic Control

Use protocols for intensive perioperative blood glucose control for both diabetic and non-diabetic adult patients undergoing surgical procedures to reduce the risk of SSI. 

*WHO - STRONG recommendation*

Hyperglycaemia

- Contribute to cellular damage, vascular and immune dysfunction
- Association with adverse outcomes, e.g. SSI, delayed wound healing, increase LOS

Duggan EW, et al. Anesthesiology 2017
Farrokhi F, et al, Best Pract Res Clin Endocrinol Metab. 2011
Glycaemic Control

• Perioperative hyperglycaemia reported in:
  • 20-40% of patients undergoing general surgery
  • ~ 80% of patients after cardiac surgery

• Optimal peri-op glucose target level in diabetic & non-diabetic patients
  • No uniform recommendation from WHO
  • Generally agreed ≤ 180 mg/dL (10 mmol/l)
Implementation

Summarize

• Review local protocols – identify potential gaps, e.g. no guidance pre-op glucose control

Identify

• What actions should be taken for specific values or cut-offs
• How frequently should blood glucose be measured

Measure

• Monitor compliance with adherence to glycaemic optimisation
  • BSL measured & documented - pre-op, intra-op & post-op
  • Action taken for hyperglycaemia

Note: Multi-disciplinary groups* should work together to create appropriate protocols for hyperglycaemia screening, monitoring and treatment

*anaesthesiology, surgery, critical care/internal medicine and endocrinology
Example of Data Feedback

- Pre-operative BSL ≤ 10mmol/L
- Intra-operative BSL ≤ 10mmol/L
- Post-operative BSL ≤ 10mmol/L 48hrs

Proportion (%)
Summary – Approach to Glycaemic Control

• Know your data
  • Which patients are diabetic
• Does your hospital have a program requiring glycaemic control prior to surgery
• Include a multi-disciplinary team in decisions
• Engage leadership support for any areas of controversy
Normothermia

Use warming devices in the operating room and during the surgical procedure for patient body warming with the purpose of reducing SSI. 
WHO – conditional recommendation

Hypothermia

• Core temperature < 36°C

NOTE: excludes procedures that requires active cooling
Normothermia


This figure shows the difference in surgical site infection rates (colorectal surgery) between subjects who were normothermic (n=104) and those who were hypothermic (n=96)
Normothermia

• Each patient should be assessed for risk of hypothermia
  • Pre-op temp <36°C; GA; major surgery; risk of cardiovascular complications

• Temperature monitoring method and frequency should be standardised

• Measures to prevent hypothermia
  • Limit skin exposure; initiate passive warming measures – hats, booties, warmed blanket
  • Active warming
    • Warmed forced-air blankets
    • Warmed fluids – IV, blood products, irrigation
  • Designate responsibility and accountability for thermoregulation
Forced Air Warming

This figure shows the temperature trends between:
1. control group (warmed cotton blankets), and
2. treatment group (forced air warming)

Forced air warming was more effective in preventing hypothermia than warmed cotton blankets.

Implementation

Summarize
• Review local protocol for preventing hypothermia and how well it is adhered to pre-, intra- and postoperatively

Identify
• What adjunctive warming measures are available
• Involve frontline staff in barrier identification and strategies

Measure
• Adherence to measures – e.g. use of warming devices
• Body temperature at different stages of peri-op journey
  • Assist ID of problem-prone areas, e.g. pt hypothermic on arrival to anaesthetic room – review practices in holding bay/ward/ED

Ensure (all patients receive intervention)
• Coordinate with colleagues the best means to maintain normothermia
  • Assign responsibility to ensure patient remains warm in ward, ED, OT holding bay, anaesthetic room, theatre, PACU
• Offer education - importance of pre-procedure normothermia maintenance
Example of Data Feedback
Summary - Approach to Normothermia

• Define your temperature management plan
• Process measures
  • Point prevalence audits: warm blanket; warmed forced air blanket
  • Patient feedback
• Outcome measures
  • Infection rates
• Feedback loop
Skin Preparation

• Skin preparation reduces bacterial load on skin

• Alcohol-based antiseptic solutions for surgical site skin preparation is more effective in reducing SSIs compared to aqueous solutions and alcohol-based povidone-iodine

WHO – STRONG recommendation
Implementation

Summarize
• Evidence and be aware of any new/revised guidelines

Identify
• Identify local barriers – surgeon preference
• Consider a pre-op bathing program that can be used consistently and a strategy for just-in-time alternatives when pre-surgical bathing is incomplete

Measure
• Compliance with hospital’s pre-surgical bathing recommendations
• Monitor compliance with skin antisepsis
• Provide feedback to all stakeholders

Ensure (all patients receive interventions)
• Develop practices that support preoperative bathing
• Consider populations at-risk of SSI and overall infection rates when selecting a pre-operative bathing program
# Skin Antisepsis Audit Tool

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation Number</td>
<td></td>
</tr>
<tr>
<td>1. Name of Procedure</td>
<td></td>
</tr>
<tr>
<td>2. Date of Operation</td>
<td></td>
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<tr>
<td>3. Time of Operation</td>
<td></td>
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<tr>
<td>4. Surgeon</td>
<td></td>
</tr>
<tr>
<td>5. What type of skin preparation was used for this case?</td>
<td></td>
</tr>
<tr>
<td>- Betadine</td>
<td></td>
</tr>
<tr>
<td>- Chlorhexidine</td>
<td></td>
</tr>
<tr>
<td>- Durasept</td>
<td></td>
</tr>
<tr>
<td>- Other</td>
<td></td>
</tr>
<tr>
<td>- Name, if other</td>
<td></td>
</tr>
<tr>
<td>6. If the patient had an ostomy, what type of skin preparation was used on the ostomy only?</td>
<td></td>
</tr>
<tr>
<td>- Betadine</td>
<td></td>
</tr>
<tr>
<td>- Chlorhexidine</td>
<td></td>
</tr>
<tr>
<td>- Durasept</td>
<td></td>
</tr>
<tr>
<td>- Other</td>
<td></td>
</tr>
<tr>
<td>- Name, if other</td>
<td></td>
</tr>
<tr>
<td>7. If Durasept was used, was it allowed to air dry for 3 minutes (please time it)?</td>
<td></td>
</tr>
<tr>
<td>- Yes, after reminder</td>
<td></td>
</tr>
<tr>
<td>8. If Chlorhexidine was used, was it allowed to air dry for 2 minutes (please time it)?</td>
<td></td>
</tr>
<tr>
<td>- Yes, after reminder</td>
<td></td>
</tr>
<tr>
<td>9. If Chlorhexidine was used, was it applied using a vigorous back and forth scrubbing motion?</td>
<td></td>
</tr>
<tr>
<td>- Yes, after reminder</td>
<td></td>
</tr>
<tr>
<td>10. How many skin preparation sticks were used?</td>
<td>1</td>
</tr>
<tr>
<td>11. Who prepared the skin for incision?</td>
<td></td>
</tr>
<tr>
<td>- Name, if other</td>
<td></td>
</tr>
<tr>
<td>12. Comments</td>
<td></td>
</tr>
</tbody>
</table>

Example of Data Feedback

Pre-op Skin Prep Used Mar - June 2019

Pre-op Bathing Compliance Mar - June 2019
Summary - Approach to Skin Preparation

• Establish practical and effective bathing for both inpatient and outpatient populations
  • Consider the location of the pre-surgical patient e.g. ICU

• Establish protocol for skin antisepsis
  • Product selection should be determined after consideration of numerous factors specific to the patient and the facility
Other Measures to Consider

• Hair removal
  • Avoid or clip, do not shave

• Decolonisation of *S. aureus* carriers
  • Cardiothoracic & orthopaedic

• Mechanical bowel preparation
  • Alone (without oral antibiotics) should not be used to reduce SSI in elective colorectal surgery

• Surgical hand preparation
  • Scrubbing with either a suitable antimicrobial soap and water or using a suitable alcohol-based hand rub
Implementation

• **Summarise** the evidence

• **Identify** local barriers to implementation
  • Identify and collaborate with stakeholders
  • Be aware of local practices
  • Anticipate and work through controversies

• **Measure** performance
  • Give feedback

• **Ensure** all patients receive the intervention
Conclusion

• Review data
  • Infection rates – comparison to Victorian aggregate
• Summarise evidence
• Deep dive into SSI prevention measures
  • Identify local defects
  • Address local barriers
• Develop implementation plan
  • Engage
  • Educate
  • Execute
  • Evaluate
Acknowledgements

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Collaborators
• Infection Prevention staff at participating sites
• VICNISS staff: Judith Brett, Jennifer Bradford and Leon Worth