Reducing Surgical Site Infections (SSIs)
Learning Session 2
Western Cape, November 2015
Aim of the SSI collaborative

To reduce Surgical Site Infections (SSIs) using a ‘care bundle’ and a Quality Improvement (QI) approach
Participating Hospitals

- Tygerberg
- Groote Schuur
- Red Cross Children’s Hospital
- Paarl
- Worcester
- New Somerset
- Mowbray Maternity
- Mitchells Plain
- Khayelitsha
- Eerste River
- George Hospital

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Breakthrough Collaborative Series

Repeated improvement cycles:

18 - 24 months

Learning session 1

Support, support, support from District and each other

Learning session 2

Learning session 3

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Aim Statement

At ............hospital we aim to reduce SSIs in ..............department/surgeries

From a rate of ............... to ............./ xxx cases

Within ............... months
Hospital presentations

- Presentations divided into groups that highlight aspects of running an improvement project
- Teams to assess each using the checklist provided (based on the Model for Improvement)
- First question – did the change make an improvement?
- Theory will be integrated with the presentations
What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?

Model for Improvement

Act

Plan

Study

Do
Measurement: team exercise

1. SSIs (outcome measure)
   • what are we measuring (definition)?
   • how do we collect the data?
   • how do we display the data?

2. SSIs bundle compliance
   • how do we collect the data?
   • how do we display individual bundle compliance?
   • How do we define overall bundle compliance?
Measurement: presentations

1. Answer the same questions on the checklist provided, individually or in pairs
2. Coaching after each presentation to highlight QI concepts

<table>
<thead>
<tr>
<th>Presenting Team</th>
<th>Was the change an improvement?</th>
<th>SSIs well defined?</th>
<th>Monthly outcome measure (graph)</th>
<th>Compliance data – to individual bundle elements</th>
<th>Compliance data – overall</th>
<th>Next steps suggested (what to work on next)</th>
</tr>
</thead>
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</table>
Measurement: presentations

1. Tygerberg Hospital
2. Groote Schuur Hospital
3. Mitchell’s Plain Hospital
Context:
SSI post Caesarean Section surgery

Sepsis rate: Estimated >12.5%
(MMed study of Dr Marsel Coetzer to reveal true infection rate)

Intervention: Implemented SSI Bundle 1 March 2015

Aim: 25% reduction in Caesarean Section SSI by June 2016
Patient burden in obstetric care

- 700 – 750 total deliveries per month
- 350 total Caesarean Sections per month
- 50 elective cases per month
Obstetric care in Metro East District

Primary level: MOU

Level 1:
- KDH
- HHH
- KBH

Level 2 & 3:
- TBH

Day Hospitals: postop & postnatal care

Including referral of patients outside of Metro East – Boland & Winelands
Stakeholders

• Antenatal ward (F2)
• Obstetric High Care Unit (C2A East)
• Caesarean Section theatres (elective & emergency)
• Postnatal wards (J2, J5, Postnatal Special Care Unit)
# Bundle Elements

## Pre-op skin preparation
- **Ward**: clean patient, clean clothes, clean sheets, chlorhexidine bath/shower
- **Theatre**: skin prep procedure

## Hair removal

## Antibiotic prophylaxis
- Optimal choice
- Optimal dosage
- Optimal time of administration

## Perioperative normothermia

## Perioperative normoglycaemia
Challenge: 
Postop surveillance of SSI

• Patient is discharged 3 days postop
• Surveillance up to 30 days postop
• Postop care at Day Hospitals
• Some patients from outside the Metro East District

• Considerations (not feasible for now):
  – Cooperation with Day Hospitals
  – Telephone surveys
  – Patient requested to report postop infection
Aim

Change our SSI surveillance strategy:

• Must be feasible
• Give an idea of where we stand with SSI
• Provide us with information to measure our progress
Change

- **Focus on:** severe sepsis cases requiring a return to the operating theatre at Tygerberg Hospital for:
  - relook
  - wound debridement
  - hysterectomy

- **Outcome measures:** days between severe sepsis cases

- **Aim:** Increase days between severe sepsis cases by achieving maximum compliance with bundle elements

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Measurement – are we getting anywhere?

• **Outcome measurements**
  – Days between severe sepsis cases

• **Process measurements**
  – Compliance with bundle elements
Average of 8 days between septic cases
Compliance with bundle elements

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</thead>
<tbody>
<tr>
<td>Antibiotic prophylaxis</td>
<td>54%</td>
<td>17%</td>
<td>42%</td>
<td>26%</td>
<td>19%</td>
<td>58%</td>
<td>69%</td>
<td>57%</td>
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<tr>
<td>Skin prep: ward</td>
<td>81%</td>
<td>50%</td>
<td>84%</td>
<td>82%</td>
<td>69%</td>
<td>27%</td>
<td>38%</td>
<td>82%</td>
</tr>
<tr>
<td>Skin prep: theatre</td>
<td>58%</td>
<td>50%</td>
<td>90%</td>
<td>55%</td>
<td>63%</td>
<td>47%</td>
<td>48%</td>
<td>80%</td>
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<tr>
<td>No shaving</td>
<td>88%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>82%</td>
<td>57%</td>
<td>100%</td>
</tr>
</tbody>
</table>

- Antibiotic prophylaxis
- Skin prep: ward
- Skin prep: theatre
- No shaving

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Thank you
The same data presented as bar and line charts.
Overall compliance

Overall compliance (proxy - using the lowest compliance of the four bundle elements)
Groote Schuur Hospital
Best Care Always SSI
Follow Up Learning Session
18 November 2015
Heather Engelbrecht
The Context

- Cardiac surgery patients
- SSI bundle commenced 1 year ago
- 20 - 25 patients undergoing cardiac surgery per month
- No base line on outcomes as we haven’t managed to be consistent in our data collection of surgical site infections.
The Problem or Challenge

- A complicated SSI data collection tool.
- The tool required specific information which would prove useful for additional research at a later stage.
- Too many data elements, outcome not defined according to CDC criteria, tool required inputs from users in 5 areas, poor system in place for coordinating movement of form.
- We don’t have a baseline and a goal statement.

Result: incomplete check lists, staff found tool cumbersome, stuck on process management and not progressing to completion of outcome measurement.
How to Guide: Prevent Surgical Site Infections
Prevention of Surgical Site Infections

Data Collection Record

Please complete for all patients undergoing Cardiac Surgery

1. Pre-Operative
   1.1 Assessment (D24/C26 ward/C26 ICU/G-floor wards)
      1.1.1 Diabetic
      1.1.2 Did the patient have an existing infectious process at the same site as the planned surgical procedure?  
          Yes  No
      1.1.3 Did the patient have an existing infectious process at another site  
          Yes  No

   1.2 Hair Removal
      Method of Hair Removal
      (Registered Nurse- D24 /C26 ICU/C26 ward/G floor wards/Theatre)
      - Hair removal Yes  No
      - Clipper – Yes  No
      - Razor Yes  No

      Time of razor use -- hrs --
      Date of razor use: ________________
      Wet: Yes  No
      Dry: Yes  No

   1.3 Skin cleaning (after hair removal)
      (Registered Nurse- D24 /C26 ICU/C26 ward/G floor wards/Theatre)
      Ward – Hibiscrub/bioscrub full wash
      Theatre – Hibitan scrub
      Yes  No

      Time: -- hrs --

   1.4 Date of Surgery: __________________________ (day/month/year) (Surgeon) __________

   1.5 Procedure: ____________________________________ (Surgeon) __________

2. Theatre (Anaesthesia)
   2.1 Wound Class: (Theatre)
      Clean (class I)  Clean-Contaminated (class II)  
      Contaminated (class III)  Dirty (class IV)

   2.2 ASA Score (Theatre)
      ASA Score: 1  2  3  4  5  6 Emergency
      Yes  No

   2.3 Antimicrobial Prophylaxis Given
      (Anaesthesia)
      Any allergies to Antibiotics?  Yes  No

      Name of Drug Time Administered 1st dose -- hrs --
      Cefazolin
      Clindamycin
      Other
      Time Administered 2nd dose -- hrs --
      (Above drugs to be given within 0-60 minutes prior to incision)
The Aim

• To implement new checklist by 1 November 2015 in order to obtain our first outcome measure results by 30 January 2016.

• CDC guidelines – SSI may be diagnosed 90 days post cardiac surgery.
The Change

The aim of the intervention was to revise/simplify the data collection tool (checklist)

• 5 yes and no questions pertaining each bundle element
• Simple for staff to complete
• Clarity on who is responsible for completing each question
• Provide a field for documenting SSI’s
• Provide SSI definitions according to CDC guidelines
• Attach SSI checklist to consent form
• IPC to co ordinate the movement of the checklist
• SSI bundle has been set up on IHI website for capturing outcomes.
### Groote Schuur Hospital
#### BCA: Surgical Site Infection Checklist

<table>
<thead>
<tr>
<th>Bundle Elements</th>
<th>Bundle No.</th>
<th>Role</th>
<th>Yes/No/NA</th>
<th>General comments (where non-applicable has been selected) and interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative Chlorhexidine wash within 4 hours before surgery</td>
<td>Pre Int. Ward</td>
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</tr>
<tr>
<td><strong>1. Decontamination</strong></td>
<td></td>
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<tr>
<td>Administration of antibiotics 90 - 120 minutes before incision</td>
<td>Operating Theatre</td>
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</tr>
<tr>
<td>Administration of antibiotics within 24 - 48 hours post-operatively</td>
<td>Int. or Post Op. Ward</td>
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<tr>
<td><strong>2. Antibiotics</strong></td>
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<tr>
<td>Maintain patient’s temperature at or above 36°C for 48 hours post-operatively</td>
<td>Int. or Post Op. Ward</td>
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<td><strong>3. Temperature</strong></td>
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<tr>
<td>Leave temperature below 36°C for 48 hours post-operatively</td>
<td>Int. or Post Op. Ward</td>
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</tr>
</tbody>
</table>

**Confirmed Surgical Site Infection**
- Date of surgery: 
- Date of 50 days post op: 
- Surgical Site: 
- Ward: 
- Signature: 

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**Best Care Always:**
Surgical Site Infections Bundle Element Annotations

<table>
<thead>
<tr>
<th>Bundle Elements</th>
<th>Annotate</th>
<th>Annotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Decontamination</td>
<td></td>
<td>Pre-operative Chlorhexidine wash within 4 hours before surgical procedure</td>
</tr>
<tr>
<td>2. Antibiotics</td>
<td></td>
<td>Dressings not to be removed if it does not interfere with surgical site</td>
</tr>
<tr>
<td>3. Antibiotics</td>
<td></td>
<td>Incision to be dressed with a dressing and NOT healing within 4 hours of surgery</td>
</tr>
<tr>
<td>4. Sterile dressings</td>
<td></td>
<td>Antimicrobial dressings to be administrated in theatre ante room. Second dose of antibiotic to be administered if operative time exceeds 6 hours</td>
</tr>
<tr>
<td>5. Sterile dressings</td>
<td></td>
<td>Antibiotic to be discontinued within 24 hours of operation (shorter course for CAB and CAB surgery)</td>
</tr>
<tr>
<td>6. Antimicrobial</td>
<td></td>
<td>Post-operative temperature to be monitored for 48 hours. Antimicrobial to be re-administered if the temperature falls below 36°C</td>
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<tr>
<td>7. Glucose Control</td>
<td></td>
<td>Intraoperative glucose monitoring and interventions recorded if glucose exceeds 10 mmol/L</td>
</tr>
<tr>
<td>8. Glucose Control</td>
<td></td>
<td>Post-operative glucose monitoring, glucose to be maintained below 10 mmol/L</td>
</tr>
</tbody>
</table>

**Definition of Surgical Site Infection according to CoSR guidelines**
- **Superficial Infected Site (SI):** Involves skin and subcutaneous tissue
- **Deep Infected Site (SI):** Involves deep soft tissues of the incision e.g. fascial and muscle layers
- **Organ/Space Infection:** Involves any part of the body deeper than the fascial/muscle layers, that is opened or manipulated during the operative procedure

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Institute for Healthcare Improvement
<table>
<thead>
<tr>
<th>Bundle Elements</th>
<th>Area</th>
<th>Yes/No/NA</th>
<th>General comments (where non applicable has been selected) and Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Decolonization:</td>
<td>Pre Op Ward:</td>
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<tr>
<td>• Pre-Operative Chlorhexidine wash within 4 hours before surgery</td>
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<tr>
<td>2. Hair removal:</td>
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<tr>
<td>• Clippers for hair removal</td>
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<tr>
<td>3. Prophylaxis:</td>
<td>Operating Theatre</td>
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<tr>
<td>• Administration of antibiotic 30 - 60 minutes before incision</td>
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<tr>
<td>• Discontinuation of antibiotic within 24 - 48 hours post operatively</td>
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<tr>
<td>4. Normothermia:</td>
<td>ICU or post Op Ward:</td>
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<tr>
<td>• Maintain patient’s temperature at or above 36°C for 48 hours post operatively</td>
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<tr>
<td>5. Glucose Control:</td>
<td>ICU or Post Op Ward:</td>
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<tr>
<td>• Level maintained below 10 mmol/l up to 48 hours post operatively</td>
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</tbody>
</table>

**Confirmed Surgical Site Infection**

<table>
<thead>
<tr>
<th>Date:</th>
<th>Number of days post Op:</th>
<th>Surgical Site:</th>
</tr>
</thead>
</table>

**Ward:**

**Signature:**
### Best Care Always:
Surgical Site Infections Bundle Element Annotations

<table>
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<tr>
<th>Bundle Elements</th>
<th>Annotation</th>
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<tbody>
<tr>
<td>1. Decolonization</td>
<td>• Pre-Operative Chlorhexidine wash within 4 hours before surgical procedure</td>
</tr>
</tbody>
</table>
| 2. Hair removal | • Hair not to be removed if it does not interfere with surgical site  
• Hair removal to be done with clippers in ward NOT theatre within 4 hours of surgery |
| 3. Prophylaxis | • Administration of IV antibiotic within 30 – 60 minutes before incision.  
• Vancomycin may be commenced within 2 hours prior to incision when indicated because of beta-lactam allergy or high prevalence of MRSA  
• Antibiotics to be administered in theatre ante room. Second dose of antibiotic to be administered if operation exceeds 4 hours  
• Antibiotic to be discontinued within 24 hours of operation (48 hours Cardiac surgery) |
| 4. Normothermia | • Post-operative temperature to be monitored for 48 hours. Interventions to be recorded if the temperature falls below 36°C |
| 5. Glucose Control | • Intraoperative glucose monitoring and interventions recorded if glucose exceeds 10 mmol/l  
• Post-operative glucose monitoring: glucose to be maintained below 10 mmol/l |

### Definition of Surgical Site Infection according to CDC guidelines

**Superficial incisional SSI:** involves skin and subcutaneous tissue  
- Infection occurs within 30 days after procedure  
- Purulent drainage from superficial incision  
- Organisms isolated from an aseptically-obtained culture from the superficial incision or subcutaneous tissue  
- Pain, localized swelling, erythema or heat (positive culture not required if presenting with these symptoms)

**Deep incisional SSI:** involves deep soft tissues of the incision e.g. facial and muscle layers.  
- Infection occurs within 30 or 90 days after procedure  
- Purulent drainage from the deep incision  
- A deep incision that spontaneously dehiscles, or aspirated by a surgeon (this is still classified as an SSI if culture negative)

**Organ/Space SSI:** involves any part of the body deeper than the fascial/muscle layers, that is opened or manipulated during the operative procedure  
- Infection occurs within 30 or 90 days after procedure  
- Purulent drainage from a drain placed into the organ/space  
- Organisms isolated from an aseptically obtained culture of fluid or tissue from the organ/space  
- An abscess or other evidence of infection involving the organ/space that is detected on gross anatomical or histopathologic exam, or imaging test
The Outcome/Measures

• First outcome measurements will be available from 30 January 2015.
• After 1 week we have had 5 Cardiac surgery cases
• 100% bundle compliance
• Full participation from all departments involved – Pre op wards, Operating Theatre (Anaesthetics), ICU and Post Op wards
Thank you
MITCHELL’S PLAIN HOSPITAL
Best Care Always SSI
Follow Up Learning Session
18 November 2015
Ms.F.Brown:IPC
PROBLEM IDENTIFICATION

• No database kept of current sepsis rate in the hospital
• No SSI Bundle
• Number of caesarian Section from Jan-Jun (6 months) 2015: 573
• Number of Elective C/section: 129
• Number of Emergency C/section: 444
• Number of patients with post operative C/section sepsis in that period: 9 Emergency C/section and 1 Elective C/section
REFLECTION OF STATS

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Total Sepsis</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Elective C/section</td>
<td>129</td>
<td>1</td>
<td>0.78</td>
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<tr>
<td>Emergency C/section</td>
<td>444</td>
<td>9</td>
<td>2.03</td>
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</tbody>
</table>
Current Practices

- Chlorhexidine Wash for Elective C/section
- Antibiotic Prophylaxis given by anaesthetist
- No hair removal (clippers not available yet)
- Normathermia (bair hugger/warm fluid)

Challenges:
How to ensure that emergency C/section adhere to the current practices?
Please help/advice!!!!!!!
Improvement Plan

• Implement Bundle elements - same as current practice, because it seems to be working.
• Clippers ordered - ? Petty cash
• Wound team established – assist with bundle execution.
• Regular meetings with role players: Doctors / Nurses / Pharmacist / IPC / Operational managers

CONTINUE UNTIL WE SUCCEED
Thank you
## REFLECTION OF STATS

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<th>Percentage</th>
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<td>444</td>
<td>9</td>
<td>2.03</td>
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</tbody>
</table>

Chi Square p=0.339 (not significant)
Getting started
Who should be on our team?

Innovators: 2%
Early Adopters: 13%
Early Majority: 35%
Late Majority: 35%
Traditionalsists: 15%

Source: E Rogers: Diffusion of Innovation
## QI progress at facilities by ....month

<table>
<thead>
<tr>
<th>Score</th>
<th>Progress</th>
<th>GSH</th>
<th>TBH</th>
<th>RXH</th>
<th>MMH</th>
<th>Paarl</th>
<th>NSH</th>
<th>WH</th>
<th>GH</th>
<th>KDH</th>
<th>MPH</th>
<th>ERH</th>
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<td>Outstanding sustainable results</td>
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<td>4.5</td>
<td>Sustainable improvement</td>
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<td>4</td>
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<td>3.5</td>
<td>Improvement</td>
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<td>3</td>
<td>Modest improvement</td>
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<td>2.5</td>
<td>Changes tested, but no improvement</td>
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<td>2</td>
<td>Activity, but no changes tested</td>
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<tr>
<td>1.5</td>
<td>Planning for the project has begun</td>
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<tr>
<td>1</td>
<td>Forming a QI team</td>
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<td>0</td>
<td>Not started or lapsed</td>
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</table>
QI Basics - presentations

1. Khayelitsha District Hospital – getting started
2. Province - Leading the SSIs collaborative
3. Red Cross Hospital – PDSA
4. Paarl Hospital - spread
Western Cape Government

Health

KDH BEST CARE ALWAYS
THE PROCESS SO FAR...
CHALLENGES

• Teething problems
• Filling of crucial posts
• Stabilizing services
• Differing priorities
• Lack of information
• Lack of managerial support
### AND THEN...
**GET ROLE PLAYERS ON BOARD & CREATE A BCA TEAM**

<table>
<thead>
<tr>
<th>ACT</th>
<th>PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role-players to attend learning session</td>
<td>Meet with individual role-players to discuss BCA</td>
</tr>
<tr>
<td>Post-learning session combined meeting</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>STUDY</th>
<th>DO</th>
</tr>
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<tbody>
<tr>
<td>Successfully had individual discussions</td>
<td>Schedule meetings</td>
</tr>
<tr>
<td>Combined meeting: postponed due to unavailability of role players</td>
<td>Encourage role-players to attend the next BCA SSI learning session</td>
</tr>
</tbody>
</table>
WHAT’S NEXT?

- Start with implementation!
Thank you
Getting started

WILL

IDEAS

EXECUTION
Who should be on our team?

Source: E Rogers: Diffusion of Innovation
<table>
<thead>
<tr>
<th>Score</th>
<th>Progress</th>
<th>GSH</th>
<th>TBH</th>
<th>RXH</th>
<th>Mowbray</th>
<th>Paarl</th>
<th>NSH</th>
<th>Worcester</th>
<th>George</th>
<th>KDH</th>
<th>ERH</th>
<th>MPH</th>
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<td>Improvement</td>
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<td>3</td>
<td>Modest improvement</td>
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<td>Changes tested, but no improvement</td>
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<td>Activity, but no changes tested</td>
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<td>Planning for the project has begun</td>
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Provincial Oversight of the BCA Programme
Provincial Oversight of the BCA Programme

• Handover in November 2012
  — Quality Assurance sub-directorate, Health Impact Assessment
  — Public Health Registrar
    ➢ Yearly rotation
    ➢ Academic commitments and other projects
  — 2015: Public Health Specialist appointed in QA
Activities

• Passive:
  – Telephonic and email contact
  – Available to answer questions/queries
  – Check up on Extranet (not scheduled)

• Active:
  – Visits to hospitals
    ➢ Situational Analysis
    ➢ Provide Support
    ➢ Answer questions or find the answers to them!
    ➢ Presentation to clinicians
    ➢ Extranet training
    ➢ 2015: Visited 5/9 hospitals initially on the project
  – Learning Sessions
Reports

• Review data included in 6-monthly QA reports (not all facilities)

• Annual Report (Sept-Oct)
Future

• BCA SSI Project identified as a project towards the realisation of the 5 provincial strategic goals of the Department of the Premier
  — SG3: Increasing Wellness, Safety and tackle Social Ills

To do List

• Identify a schedule for hospital visits including new teams
• Create a formal reporting schedule
• Plan roll-out to district hospitals
HOW

can we help you?

www.bestcare.org.za
Thank you
Red Cross War Memorial Children’s Hospital
Best Care Always SSI
Follow Up Learning Session
18 November 2015
Heide Kunzmann (PICU RN)
The Context

- In 2014-6 children post cardiac surgery with mediastinitis, required PICU admission
- ±300 cardiac cases per year
- 2% infection rate that needed PICU readmission to manage the complication
The Aim

- To decrease the readmission rate of post operative cardiac SSI’s to PICU from 2% to 0%
- **Aim of the first PDSA cycle**
  - To ensure the microbial load on skin as low as possible
First change

- Children should receive a pre operative wash with Hibiscrub the night prior surgery and a second wash 4-6 hours prior surgery
The first PDSA

**Act:** Adapt: suggested that we check that the child is clean (swab with a bit of d-germ on a swab)

**Plan:** Ward E1 and D1 (pre-op wards for cardiacs) was trained how to wash on day and night shift

**Study:** Children still “dirty” when arriving in theatre, despite being washed. The cloth that we washed the patients with was to smooth. There was very little exfoliation.

**Do:** The change in practice was communicated to all the staff in ward E1 and D1 and staff was trained by the PICU mentor.
The study of the second PDSA

• Theatre staff reported that when they do the pre operative scrub, the patients are found to be clean

• Compliance of pre operative washing soon went up to 90-100%, but still difficult to capture accurate data for overall compliance
The Outcome/Measures

Overall compliance forms not filled in but pt washed, good feedback from OT and documentation on washing done

23/12/14-15/01/15 ICU and E1 day and night training on pre operative washing

ICU staff trained again on SOP, but also compliance and D1 21/4/15

ICU staff trained again on compliance and spoke to anaesthetists to document their compliance

Compliance filled in well by wards and OT, ICU needs more encouragement

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The Outcome/Measures

- 12 out of 208
- Overall 5.7 % SSI
- 1% ICU readmission
  - 1 case infective endocarditis (3 ICU admissions, 6 week period)
  - 1 case required a vac dressing (ICU readmission, 9 days)
- 4.8 % -10 cases of superficial wounds managed in wards
Thank you
PDSA – scientific method

Act
- abandon
- adapt
- adopt

Plan
- what
- where
- who
- when
- how

Study

Do
Overcoming the Implementation Gap

PROBLEM

SYSTEM ANALYSIS to identify barriers to care

GREAT IDEAS

PLAN

IMPLEMENT

ACT

DO

SUCCEED/ SUSTAIN

STUDY
Rapid Cycle Change

What are we trying to accomplish?

What can we change that will result in an improvement?

How will we know that a change is an improvement?

PLAN

DO

STUDY

ACT
Improving many parts of the bundle/system at once.
The Context

• Pilot phase successfully implemented in the maternity ward, now........

• SSI-Bundle roll-out phase to Surgical Department (only elective cases and all appendectomies going from the unit to theatre)
The Aim

- To implement two elements of the SSI—Bundle and additional elements (evidence based) in the surgical unit (5B1)
- To reduce Surgical site infections in surgical unit (5B1) by 25% in 9 months (April 2016) (elective cases only)
The Problem or Challenge

• To get buy-in from all surgeons and anesthetists to roll-out the SSI Bundle to surgical department (one unit) 5B1
Addressing the challenge

• Breakthrough: Attending the 1\textsuperscript{st} SSI Bundle workshop

• Listening to expert panel / CEO involved
Other changes being tested

- Surgical prophylaxis given in theatre as a priority medication (as soon as IV is commenced)
- Clippers used instead of shaving (awaiting clippers) Most cases: No shaving
- Additional: Pre-op washing/showering with Chlorhexidine 4% soap before surgery + 2 blankets + disposable cap on head
- Pre-op checklist adapted to document interventions
The Compliance Measures being tested

• “Live audit” done in theatre (September) regarding antibiotic prophylaxis
• 6 surgical theatre cases observed
• Average time between prophylaxis given and incision made was 16 min
• All cases received the correct prophylaxis and dose
The Outcome/Measures

2015- 5B1: Surgical Site Infections

Antibiotic prophylaxis protocol changed / Chlorhexidine 4% Pre-op wash

Surveillance system improved

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Thank you
The Sequence for Improvement

1. **Developing a change**
   - Theory and Prediction
   - Testing a change
2. **Implementing a change**
   - Test under a variety of conditions
3. **Make part of routine operations**
4. **Sustaining improvements and Spreading a change to other locations**

Diagram:
- **Act**
- **Plan**
- **Study**
- **Do**

Website: www.bestcare.org.za
Implementation

• Putting the infrastructure in place for the change to become the new standard work — successful — long-lasting

• Understanding how changes will be maintained
2 big mistakes

• Go straight to implementation without testing
• Test and develop a model and walk away without an implementation process
NEW SOMERSET HOSPITAL

Best Care Always SSI
Follow Up Learning Session
18 November 2015
Ms. Ohlen Ohlson
Best Care Always SSI Follow Up Learning Session
Model for Improvement

We aim to prevent hospital acquired infections within our hospital.

Patient Safety
Quality of Care
Problem-solving by Frontline Staff and Management, with Clinical Input from National and Global Experts

**How will we know that a change is an improvement?**
Using the PDSA cycle was of great help.
The Context

• 2ND Floor is a 40 bedded male and female surgical ward with the following:

• General surgery, Urology and Ear Nose & Throat surgery (ENT)

• Types of infections: Pseudomonas, Acinetobacter, MRSA of which Pseudomonas is seen specifically in patients with burn wounds and leg ulcers and malnourished patients.

• The 2nd floor team was the last to come on board with BCA in December 2011

• Difficulty in getting to understand and get the ball rolling however since then we never looked back
The Problem or Challenge

• Getting **buy-in** from the nursing as well as clinical teams was difficult

• In terms of compliance getting the **clippers** in order to be 100% compliant was a major challenge

• **Lack of staffing** within the unit impacted on many things e.g. collection of data, interrogating and recording data etc.

• High turnover and **acuity of patients** admitted to the ward daily including surgery performed daily.

• Having to deal with 3 different disciplines although surgery i.e. general, urology and ENT and each discipline had their **own perception/view** i.t.o infection control.

• Intermittent problems with availability of **hand paper towel**
The Aim

We believe that every patient deserves the best care, every time, and therefore our aim is to improve:

– Patient Safety
– Quality of Care

• In view of the number of infections the decision was made to go back to basics.
• Ensuring daily availability of hand soap, hand paper towel, hand sanitizers on ward rounds
• Doctors given gentle reminders to dispose of wound dressings immediately once removed.
• Ensuring compliance i.t.o aseptic technique when doing dressings as per policy
• Cleaning of clinic room prior to procedures
• Monthly presentation of infection stats for interrogation at FBU meetings
• Implementation of weekly infection ward rounds as suggested by HOD for surgery.
• Implementation commenced on 21 Jan 2013 by Prof Mendelson accompanied by the surgical team
The Change

• Doctors became more aware regarding the use of antibiotics and compliance thereof i.e. number of days for antibiotics prescribed. Removal of intravenous line once no longer required

• Immediate isolation of patient in the event of confirmed swab culture of e.g. Pseudomonas/ Acinetobacter

• All these implementations resulted in a noticeable improvement in quality of patient care and infection rate.
The Outcome/Measures

- 100% Support of the medical team.
- SSI Bundle is done as a team nursing and medical and not just nurse driven.
- Concerns discussed and plans to address short falls in order to ensure compliance and improve quality of patient care.
Thank you
The Aim

We believe that every patient deserves the best care, every time, and therefore our aim is to improve:
- Patient Safety
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- Implementation commenced on 21 Jan 2013 by Prof Mendelson and carried through by the surgical team

Aim Statement

At Somerset hospital in General surgery, Urology and Ear Nose & Throat surgery (ENT)

We aim to increase the days between SSIs to > 300 days between infections

Within 18 months
The Outcome/Measures

- 100% Support of the medical team.
- SSI Bundle is done as a team nursing and medical and not just nurse driven
- Concerns discussed and plans to address short falls in order to ensure compliance and improve quality of patient care

WC-NSH-2nd Floor-Surgical Days Between Surgical Site Infections

101 days since last event (today 11/17/2015)

goal = 300.00

LS1
July
Where we are now…

Implemented SSI guidelines in surgical specialties from August 2015

Existing data capture processes adapted and further developed

Analyze, find trends and implement change

Act  Plan

Study  Do
SSI bundle of BCA implemented

- Formally implemented in all surgical specialties and anaesthesia after last meeting:
  - Pre-op chlorhexidine bath
  - Guidelines w.r.t. operative field preparation
  - Prophylactic antibiotics
  - Temperature control

- Clinical documentation adapted to also capture SSI specific parameters (surgery, orthopaedics, O&G).
SSI data capture (surgery)

Data to monitor compliance with SSI bundle from operation reports:
- Prophylactic antibiotics
- Temperature control
- Operative field preparation
- Wound classification

Data to capture SSI’s from discharge summaries and admission notes:
- SSI developed before discharge
- Unexpected readmission due to SSI

Electronic operation reports
Electronic discharge summaries
Electronic admission notes

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Operation reports:

**Perioperative preparation & SSI compliance**

- **Perioperative drugs & devices**
  - No prophylactic antibiotics used; not indicated
  - Prophylactic antibiotics: cephazolin within 60 mins pre-op
  - Prophylactic antibiotics: metronidazole within 60 minutes pre-op
  - Prophylactic antibiotics: other antibiotics within 60 minutes pre-op
  - LMWH heparin for DVT prophylaxis
  - Systemic therapeutic heparin for vascular surgery
  - Local heparin for vascular surgery
  - Platelets
  - Fresh frozen plasma
  - Packed red blood cells

- **Prosthetics implanted**
  - None
  - Mesh for hemia repair
  - Vascular graft (PTFE or Dacron)

- **Operative field preparation**
  - Select

- **Temperature control**
  - No temperature control measures applied
  - Bair hugger
  - Warmed fluids given intra-operatively

- **Procedure type**
  - Select

**Operative risk factors**

- Operative magnitude in terms of impact on patient physiology: Select
- Presence of malignancy: Select
- How urgent was the operation?: Select
- Blood loss: Select
- How many operations did the patient undergo in the last 30 days including this operation?: Select
- Degree of contamination of operative field: Select

**Waiting time for emergency surgery**

Hours between decision to operate and surgery: enter 0 less than 1 hour: Select

Emergency theatre triage colour that the patient was booked as: Select
Compliance: Dept. Surgery SSI Data: Temperature control (elective surgery)

Elective Surgery of > 30 minutes duration: Temperature control

- Temperature control measures applied
- Temperature control measures omitted
- % done

[Chart showing temperature control measures applied and omitted from January 2015 to October 2015]
Compliance: Dept. of Surgery SSI Data: Temperature control (non-elective surgery)

Non elective surgery > 30 minutes duration: Temperature control

- Temp control measures applied
- Temp control measures omitted
- Total
- % done
Compliance: Dept. Surgery SSI Data: Pre-operative hair removal (elective surgery)

Operative Field Prep

- % no tshaved or clipper
- total


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Institute for Healthcare Improvement
Compliance: Dept. Surgery SSI Data: Pre-operative hair removal (non-elective surgery)

Operative Field Prep

- % not shaved or clippers used
- total
- Operative field shaved by patient before transfer to theater
  - Operative field shaved with blade on table
  - Operative field shaved with clipper on table
  - Operative field not shaved
Compliance: Dept. of Surgery SSI: Prophylactic antibiotics (all operations since 1 Jan 2014)

Antibiotic prophylaxis 1 Jan 2014 - present

- Antibiotic prophylaxis used
- Antibiotic prophylaxis not used

Always administered by anaesthesiologist during induction of anaesthesia.

Began capturing wound classification (I-IV) since October to assess appropriate use of prophylactic antibiotics.
Compliance: Antibiotic prophylaxis:

• About antibiotic prophylaxis, we need to know if it was:
  ─ Appropriately given
  ─ Appropriately omitted
  ─ Inappropriately given
  ─ Inappropriately omitted

• Therefore the need to record wound classification and compare to prophylactic antibiotic use – started October 2015.
Wound types

Wound Types from 1 October 2015

- Clean: 40%
- Clean contaminated: 18%
- Contaminated: 18%
- Dirty infected: 17%

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Compliance: prophylactic antibiotics

Appropriate use of prophylactic antibiotics from 1 October 2015

- Clean: 0 AB given appropriately, 42 AB omitted appropriately, 34 AB given inappropriately, 1 AB omitted inappropriately
- Clean contaminated: 9 AB given appropriately, 37 AB omitted appropriately, 34 AB given inappropriately, 8 AB omitted inappropriately
- Contaminated: 8 AB given appropriately, 34 AB omitted appropriately, 34 AB given inappropriately, 3 AB omitted inappropriately
- Dirty infected: 3 AB given appropriately, 33 AB omitted appropriately, 33 AB given inappropriately, 3 AB omitted inappropriately

% appropriate:
- Clean: 0%
- Clean contaminated: 9%
- Contaminated: 8%
- Dirty infected: 3%
Data capture for SSI identification

• For surgery:
  – Electronic discharge summaries: complications recorded according to the Clavien-Dindo classification of surgical outcomes.
    ➢ Based on intervention needed to treat complication.
    ➢ SSI specifically recorded.
  – Unplanned readmissions within 30 days captured
    ➢ ?Add field “Readmission for SSI? YES/NO” to enable easier identification in database.
Surgical outcomes classification simplified

| Grade II: | Requiring pharmacological treatment with drugs other than such allowed for grade I complications. Blood transfusions and total parenteral nutrition are also included. |
| Grade III: | Requiring surgical, endoscopic or radiological intervention |
| Grade III- a: | Intervention not under general anesthesia |
| Grade III- b: | Intervention under general anesthesia |
| Grade IV: | Life-threatening complication (including CNS complications) requiring ICU/ICU-management |
| Grade IV- a: | Single organ dysfunction (including dialysis) |
| Grade IV- b: | Multi organ dysfunction |
| Grade V: | Death of a patient |
| Suffix “d”: | If the patient suffers from a complication at the time of discharge, the suffix “d” (for disability) is added to the respective grade of complication. This label indicates the need for a follow-up to fully evaluate the complication.

Grade II: Pharmacological treatment required
Grade III: Surgical, endoscopic or radiological treatment required
Grade IV: ICU treatment required
Grade V: ICU Death
Outcome all inpatients

Outcome all admissions

- Uncomplicated
- Pharmacological treatment required
- Surgical, radiological intervention required
- ICU management required
- Death
- Absconded

4548 admissions
SSI’s diagnosed

SSI from 1 Jan 2014 out of a total of 4749 inpatients

- Pharmacological treatment required
- Surgical, radiological or endoscopic treatment required
- ICU required
- Death

- Superficial SSI (cellulitis or wound abscess)
- Deep SSI (abd. abscess or anastomotic leak)
- Septicaemia
- Unplanned readmission for SSI

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The Problem or Challenge

• Data capture:
  – Up to recently: suspect that complications esp. minor SSI’s (grade 2 complications) were under recorded.
  – Though we believe that most of our SSI’s are referred back to us, we don’t know for sure – need a reporting mechanism by Level 1 hospitals esp. for minor SSI’s.
  – Junior doctors still getting wound classification wrong
  – Some inaccuracies in data capture.

• SSI implementation and compliance:
  – Inappropriate use of prophylactic antibiotics – anaesthetists to ask before giving antibiotics.
  – Temperature control needs to be improved especially non-elective surgery.
Thank you
How long will it take to tell the story?

### Elective Surgery of > 30 minutes duration: Temperature control

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature control measures applied</th>
<th>Temperature control measures omitted</th>
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<td>Oct-15</td>
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- Temperature control measures applied
- Temperature control measures omitted

### Non elective surgery > 30 minutes duration: Temperature control

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- Temperature control measures applied
- Temperature control measures omitted

### Operative Field Prep

<table>
<thead>
<tr>
<th>Month</th>
<th>Operative field shaved by patient before transfer to theater</th>
<th>Operative field shaved with blade on table</th>
<th>Operative field shaved with clipper on table</th>
<th>Operative field not shaved</th>
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- Operative field shaved by patient before transfer to theater
- Operative field shaved with blade on table
- Operative field shaved with clipper on table
- Operative field not shaved

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Appropriate use of prophylactic antibiotics from 1 October 2015

% appropriate antibiotics given

0.0% 20.0% 40.0% 60.0% 80.0% 100.0%

Clean  Clean contaminated  Contaminated  Dirty infected

AB given appropriately  AB omitted appropriately  AB given inappropriately  AB omitted inappropriately
Research versus QI

• Efficient and effective (less is more)
• Simple visual display of data
  - what are you measuring to see if you are making an improvement?
  - simple line graph of outcomes eg days between infections
Open Discussion

• Normothermia

• Normoglycemia
redistribution of body heat is the primary cause of hypothermia during the first hour of anesthesia even in actively warmed patients.

Although counterintuitive, it is more difficult to end with normothermia in shorter than longer cases. Prewarming is important for short cases, and essential if normothermia is to be maintained throughout surgery.

Anesthesiology 2015; 122:276-85
Hypothermia

• Incidence
• Effects – infection and bleeding and…..
• Prevention
• Aim – 36C on arrival in recovery
• Measurement
“Normoglycemia”

- 10-12 mmol/l target
- Cardiac surgery
- Measurement
Extranet Data Entry for SSI
Best Care Always SSI Follow-Up Learning Session

18 November 2015
Outcome Measures:
• Days between Surgical Site Infections
• Surgical Site Infection Rate

Process Measures:
• SSI: Overall Bundle Compliance
• SSI: Compliance with individual elements
Days between Surgical Site Infections (SSI)
Days between Surgical Site Infections (SSI)
Days between Surgical Site Infections (SSI)

NB: Either enter data here as it happens OR you can enter at the end of the month.
If there have been no infections for the month, you can choose to enter the last day of the month as the date of event and “no infections” as a note BUT this must be deleted before the next entry otherwise your data will be incorrect!
Another option is to calculate your SSI Rate as a %

This is a custom measure on the Extranet, I can set it up for you if you like

### SSI Rate

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Number of septic caesarean sections diagnosed</th>
<th>Total number of caesarean sections performed</th>
<th>Annotation Type</th>
<th>Annotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 - 2015</td>
<td>0</td>
<td>55</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>3 - 2015</td>
<td>0</td>
<td>55</td>
<td>Event</td>
<td>No SSI detected; reconsidering surveillance methodology.</td>
</tr>
<tr>
<td>4 - 2015</td>
<td>0</td>
<td>47</td>
<td>Event</td>
<td>The SSI rate is subject to change since SSI can be diagnosed up to 30 days after the</td>
</tr>
<tr>
<td>5 - 2015</td>
<td>0</td>
<td>48</td>
<td>Event</td>
<td>The number of SSI may change since SSI can be diagnosed up to 30 days after the date of surgery.</td>
</tr>
<tr>
<td>6 - 2015</td>
<td>0</td>
<td>52</td>
<td>Event</td>
<td>Still having problems to trace potential SSI cases.</td>
</tr>
</tbody>
</table>

[www.bestcare.org.za](http://www.bestcare.org.za)
**SSI: Overall Bundle Compliance**

This is a custom measure on the Extranet, I can set it up for you if you like.
SSI: Compliance with individual bundle elements

This is a custom measure on the Extranet, I can set it up for you if you like.
Thank you
Driver Diagram

Your theory of change

• Use the driver diagrams provided to identify where you need to focus

• Plan your next intervention using the PDSA template
Surgical Site Infections reduced to ……days or …. cases between infection by ……………

AIMS

PRIMARY DRIVERS

Activated and empowered healthcare team
SSI bundle implemented
Other system factors well managed

SECONDARY DRIVERS

Leadership involved & supportive
Improvement team meets regularly
QI activities are planned
Routine measurement system
Antiseptic skin prep & chlorhexidine wash
Prophylactic antibiotics
Appropriate hair removal
Normoglycaemia maintained
Normothermia maintained
Environment (theatre) is clean
Excellent hand hygiene
Excellent wound care
Dependably sterile supplies
Supplies available
Drugs available

INTERVENTIONS (Change Ideas)

• Manager regularly attends meetings
• Quarterly reports to management
• Run charts / crosses updated monthly
• Weekly case counts
• Infection count/date

SSI Process & Outcomes

• SSI rate or days between infection
• % Preop antiseptic
• % Preop antibiotics
• % Hair removal
• % Postop glucose
• % Postop temp

MEASURES
### Driver Diagram

<table>
<thead>
<tr>
<th>What we want to achieve</th>
<th>Drivers</th>
<th>Change ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership involvement and support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activated and empowered healthcare team</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improvement team meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning QI activities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Reduce SSI To 300 days or cases between infection by

<table>
<thead>
<tr>
<th>Implement SSI bundle elements</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aseptic skin prep/Chlorhexidine wash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prophylactic antibiotics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriate hair removal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N. gonorrhoea maintained</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post operative N. gonorrhoea maintained</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Additional elements

| Environmental factors (theatres) |         |              |
| Hand Hygiene |         |              |
| Wound care |         |              |

#### Measurement

<table>
<thead>
<tr>
<th>Outcome measure</th>
<th>Numerator</th>
<th>Denominator</th>
<th>Display of data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance with implementation – Overall and individual bundle elements</td>
<td>Audits</td>
<td>Display of data</td>
<td></td>
</tr>
</tbody>
</table>

#### Reporting

<table>
<thead>
<tr>
<th>Analysis and reporting of data</th>
<th>Frontline staff</th>
<th>Management</th>
<th>Submit report for province</th>
</tr>
</thead>
</table>
AIM of this change:

PROBLEM:

The Change:
- Abandon
- Adapt
- Adopt

ACT:
PLAN:
(Who, what, where, when, how)

STUDY:

DO:

Measurement:

Prediction:
Summing up the lessons from today

Share with the person sitting next to you the most important thing *for you* today – something you learned or – something that stood out for you.
Next steps