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Yang Yang<sup>2</sup>, Poh Bee Lian<sup>3</sup>, Lee Hwee Hwee<sup>3</sup>, Goh Cheng Cheng<sup>4</sup>

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## Mission Statement

Reduce superficial incisional surgical site Infections<sup>1</sup> (SSI) for patients undergoing open emergency abdominal surgery from 23.1% to 8% (stretch goal less than 5%) within 6 months

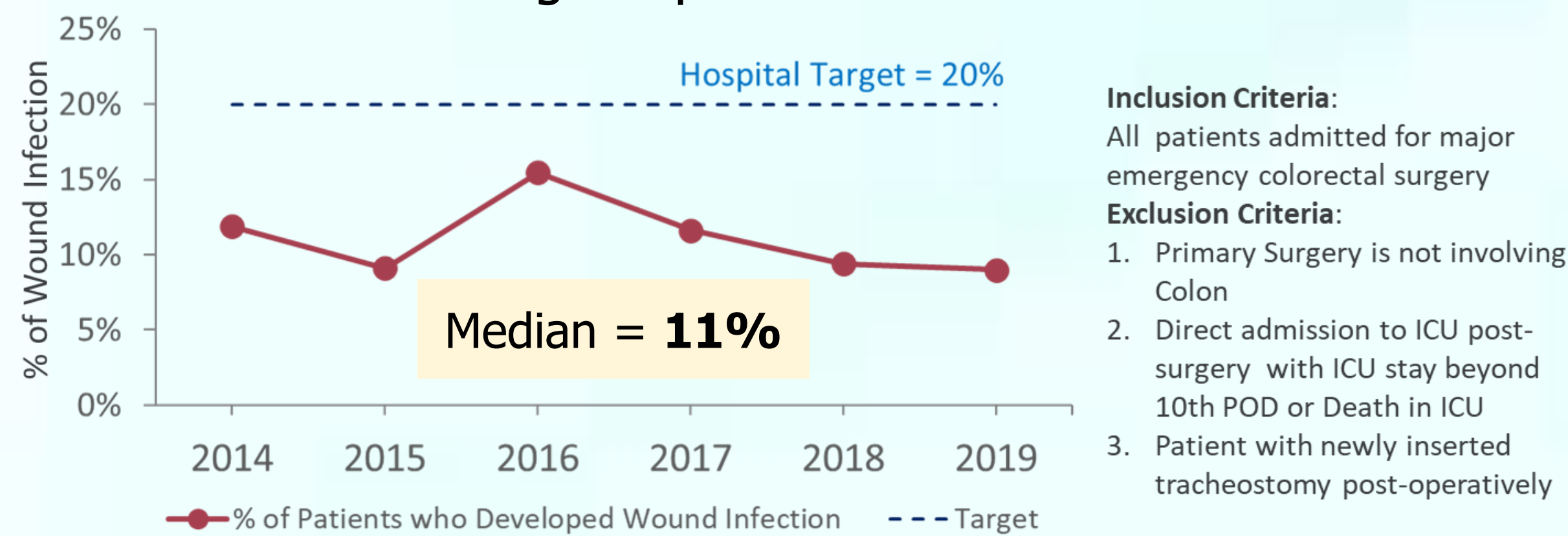
<sup>1</sup> Spreading erythema or purulent discharge in or extruding from wound observed on direct examination

## Team Members

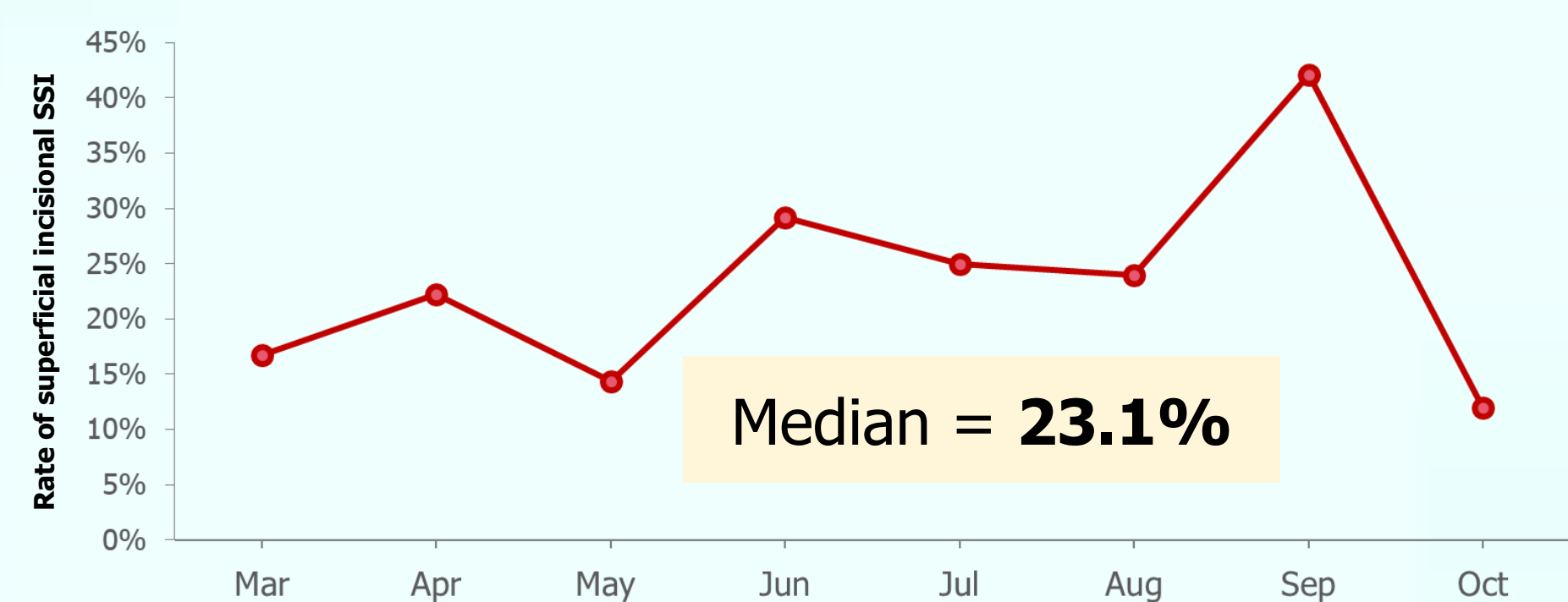
|                     | Name  | Designation                   | Department        |
|---------------------|---|-------------------------------|-------------------|
| <b>Team Leader</b>  | Dr Liu Huimin   | Consultant                    | General Surgery   |
| <b>Team Members</b> | Dr Aloysius Tan Ming Ngan   | Consultant                    | General Surgery   |
|                     | Yang Yang   | Nurse Clinician               | Operating Theatre |
|                     | Poh Bee Lian  | Nurse Clinician               | PACE              |
|                     | Lee Hwee Hwee   | Senior Staff Nurse            | PACE              |
|                     | Goh Cheng Cheng   | Nurse Clinician (Wound Nurse) | Nursing           |
|                     | Dr Liu Biquan   | Resident                      | General Surgery   |
| <b>Sponsors</b>     | Adj A/Prof Glenn Tan (HOD of General Surgery)<br>Dr Tay Guan Sze & Dr How Kwang Yeong (Colorectal Senior Consultants) |                               |                   |
| <b>Mentors</b>      | Dr Yew Min Sen & Adj A/Prof Chong Yew Lam   |                               |                   |

## Evidence for a Problem Worth Solving

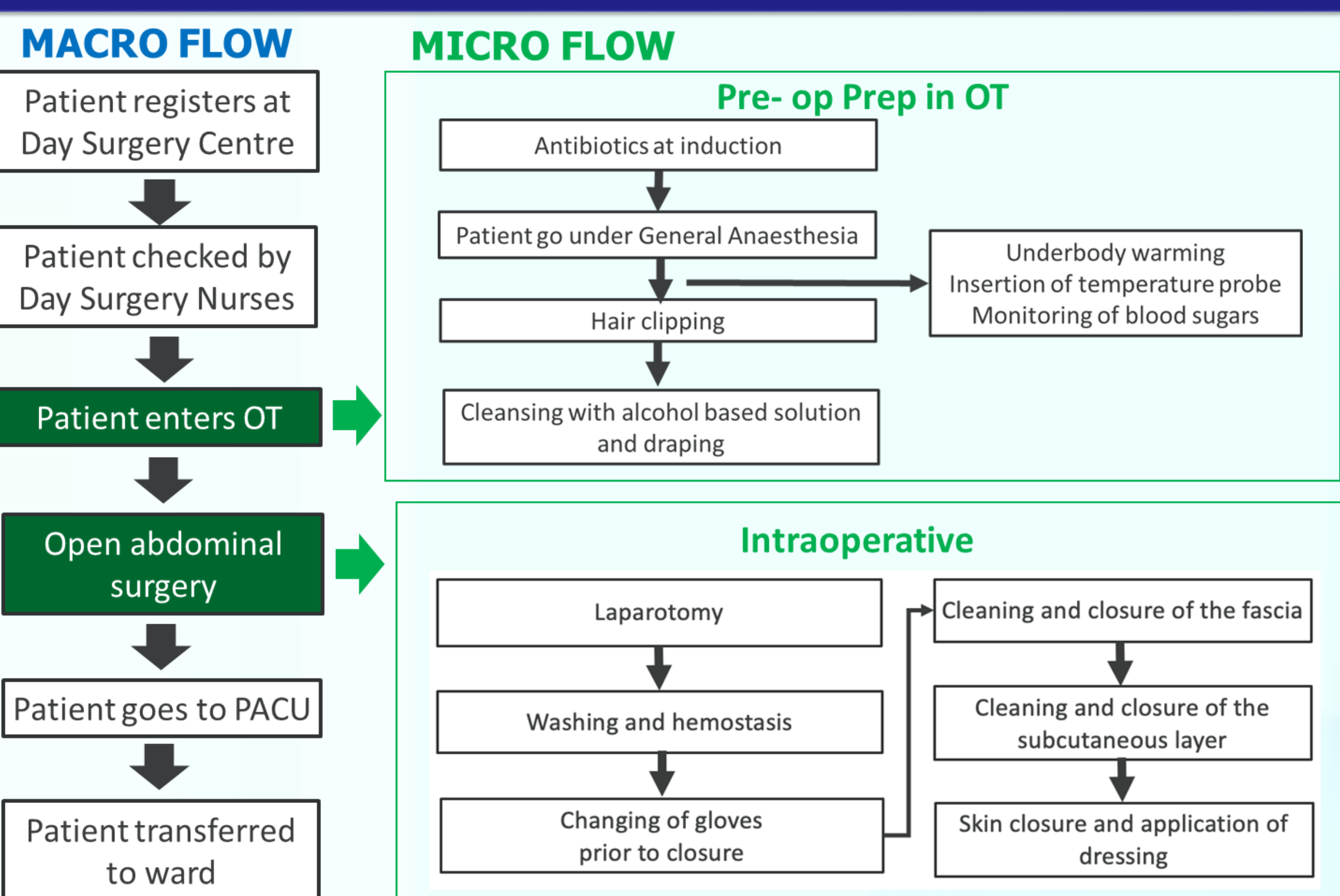
Emergency Colorectal Surgery Clinical Pathway:  
Wound Infection During Hospitalization from Year 2014 to 2019



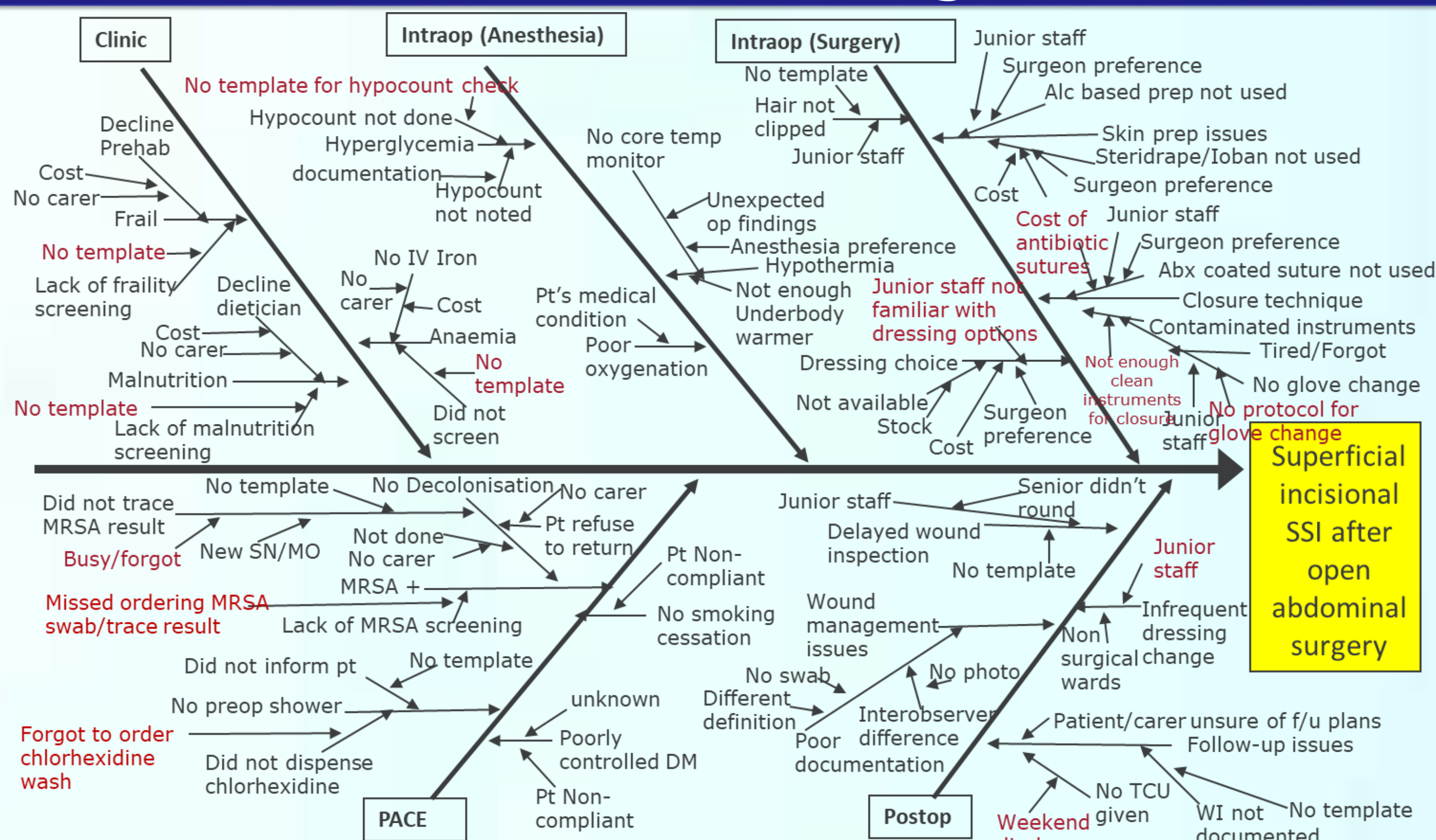
Superficial Incisional Surgical Site Infections (SSI) Rate Baseline Data  
(Period: March to October 2021)



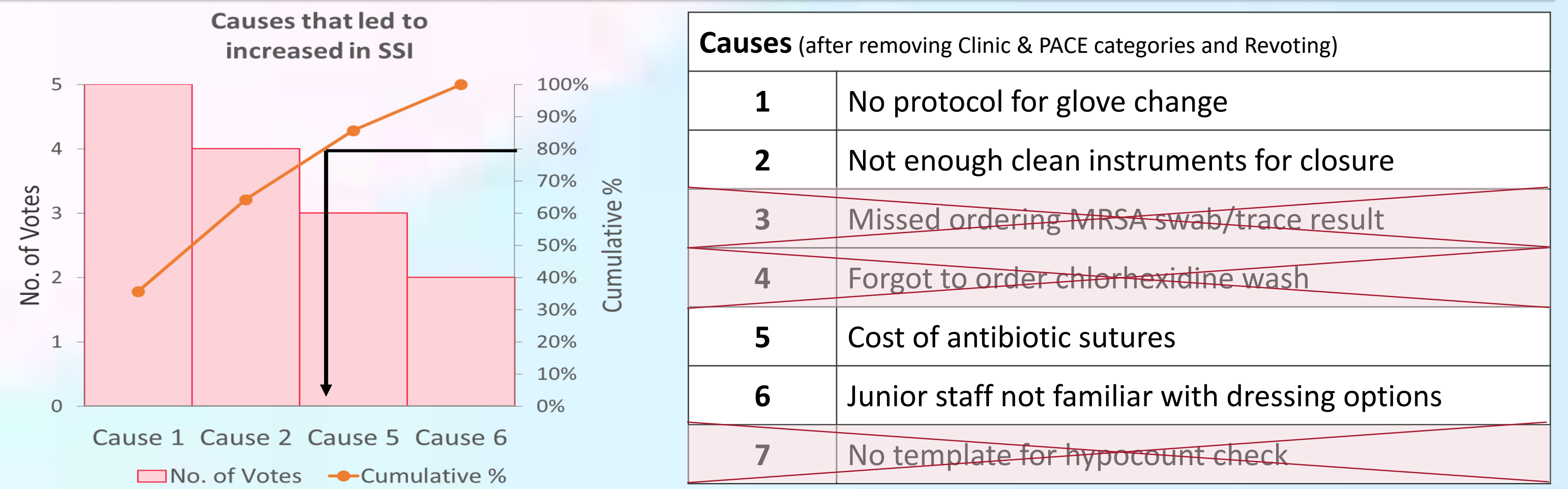
## Flow Chart of Process



## Cause and Effect Diagram



## Pareto Chart

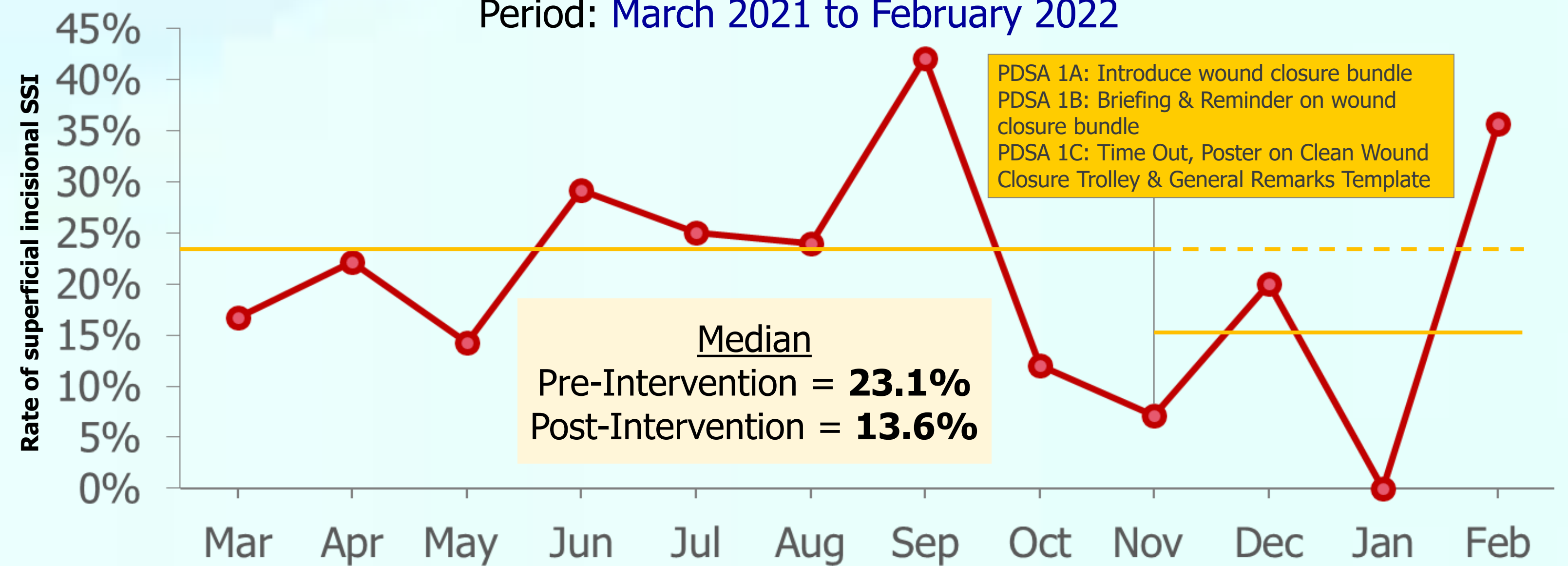


## Implementation

| Root Cause   | Intervention                   | Implementation Date |
|--|--------------------------------|---------------------|
| <b>Cause 1:</b> No protocol for glove change             | Introduce wound closure bundle | 1 Nov 2021          |
| <b>Cause 2:</b> Not enough clean instruments for closure |                                |                     |

## Results

Monthly Superficial Incisional Surgical Site Infections (SSI) Rate  
Period: March 2021 to February 2022



| Month                               | Mar '21 | Apr '21 | May '21 | Jun '21 | Jul '21 | Aug '21 | Sep '21 | Oct '21 | Nov '21 | Dec '21 | Jan '22 | Feb '22 |
|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| No. of Wound Infection              | 5       | 4       | 2       | 7       | 8       | 6       | 8       | 3       | 1       | 4       | 0       | 5       |
| No. of Abdominal Open Surgery Cases | 30      | 18      | 14      | 24      | 32      | 25      | 19      | 25      | 14      | 20      | 16      | 14      |

## Cost Avoidance & Cost Savings

| Cost Avoidance   |  | Cost Savings  | Pre-Intervention                     | Post-Intervention    |
|--|--|---|--------------------------------------|----------------------|
| Dressing cost avoided (Per Patient)  | 25 x \$14.8 = \$370                      | Average Length of Stay if SSI present (Per Patient) | 25 Days                              | 23 Days              |
| Wound Product Cost Avoided (Per Patient)   | 25 x 10 = \$250                          |   |                                      |                      |
| Total Dressing Cost Avoided (Per Patient)  | \$620                                    | Bed Days Saved (Per Patient)                        | 25 - 23 = <b>2 Days</b>              |                      |
| Assume:<br>Ave No. of Open Abd Surgery Patients who has SSI pre intervention= 5 patients per month<br>Ave No. of Open Abd Surgery Patients who has SSI post intervention= 3 patients per month | Total Dressing Cost Avoided (Annualized) | Cost of Inpatient Stay (Per Patient)                | 25 x 1114 = \$27,850                 | 23 x 1114 = \$25,622 |
|  | Total Dressing Cost Avoided (Annualized) | Cost Savings (Per Patient)                          | \$27,850 - \$25,622 = <b>\$2,228</b> |                      |
| Assume: Average Number of Abdominal Open Surgery Patients who has SSI = 5 patients per month   |  | Total Length of Stay Saved (Annualized)             | 2 x 5 x 12 = <b>120 Days</b>         |                      |
|  |  | Total Cost Savings (Annualized)                     | 120 x \$1114 = <b>\$133,680</b>      |                      |

Note: Unit Cost for Inpatient Stay Per Day Per Patient = \$1,114

## Problems Encountered

| Prototype 1 | Prototype 2   | Prototype 3  |
|-------------|---|--|
|             | <p><b>Problem: Retained gauze</b></p> <p>Improvement of wound closure set:<br/>Changed gauzes x10 to penny towels x 5</p> | <p><b>Problem: Cross contamination</b></p> <p>Improvement of wound closure bundle:<br/>Physical separation of clean and dirty trolleys</p> |

## Strategies to Sustain

- 1. Creating a new norm**
  - Continuing education (both physicians/nurses)
  - Increasing awareness to separate clean & contaminated equipment
- 2. Data collection - manpower**
  - Surgical department or Infectious disease department
  - Surveillance coordinators
- 3. Regular audit quarterly**
  - HAIE meetings versus GS department meetings