

# Towards Reducing Percentage of Surgical Site Infection (SSI) in Orthopedic Department Hospital Sultanah Nur Zahirah





# Group Members



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# Problem Identification

1

High number of incidence of surgical site infection

2

High number of amputation rate due to infection

3

Increase number of incidence of tight POP

4

Higher incidence of inappropriate documentation in HIS

5

Wrong documentation in consent form for surgical procedure

# Problem Prioritisation

No.	Opportunities For Improvement	S	M	A	R	T	Total
1.	High number of incidence of surgical site infection	15	15	15	10	15	70
2.	High number of amputation rate due to infection	15	15	15	5	10	60
3.	Increase number of incidence of tight POP	10	15	15	15	10	65
4.	Higher incidence of inappropriate documentation in HIS	15	5	5	5	10	40
5.	Wrong documentation in consent form for surgical procedure	15	10	10	10	10	55

**SCALE: 1 = Low 2 = Moderate 3 = High**

Nominal Group Technique: Voting performed by 5 group members

# Reasons For Selection

## S

## ERIOUSNESS



Almost **3%** incidence of surgical site infection documented in Orthopedic Department, HSNZ which is **higher** than accepted International standard



Average cost per patient with SSI:  
**RM 1,995.00**

Increase SSI incidence may lead to:

- Increase medication cost
- Long hospital stay
- Increase morbidity
- Economic burden



# Reasons For Selection

## M EASURABLE

The number of incidence of SSI is **retrievable** from our computerised system of HIS & OT record

## R EMEDIABLE

High incidence of SSI can be reduced through **knowledge empowerment** and **thorough compliance** of SOP



## A PPROPRIATENESS

This study is **in line with** international policy and WHO guidelines

## T IMELINESS

The remedial measures are **able to be completed** within study duration

# Refined Topic

## Selected Problem

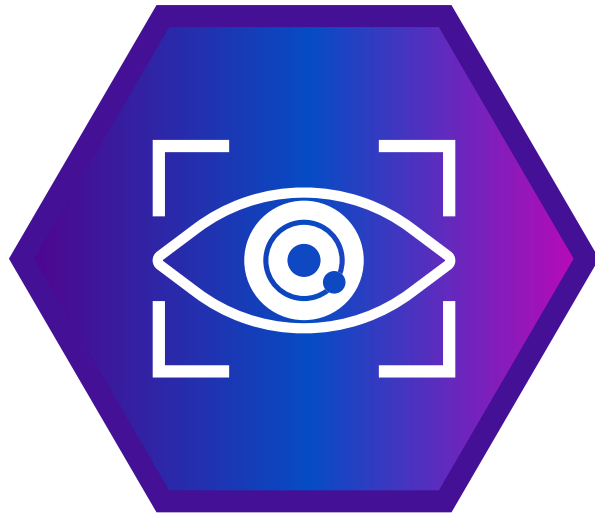
High incidence of surgical site infection in Orthopedic Department, Hospital Sultanah Nur Zahirah

## Refined Topic

Towards reducing the percentage of surgical site infection in Orthopedic Department, Hospital Sultanah Nur Zahirah

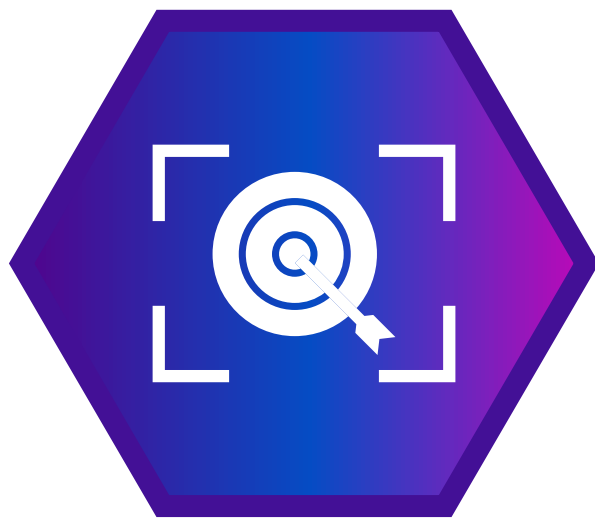


# Introduction



## Definition of Surgical Site Infection (SSI)

SSI is defined as an infection that occurs up to 30 days after surgery or up to 1 year after surgery in patient receiving implants.



## Impact of SSI

SSI cause increased morbidity, mortality, extended hospital in-patient stays, and economic burden to the hospital resources



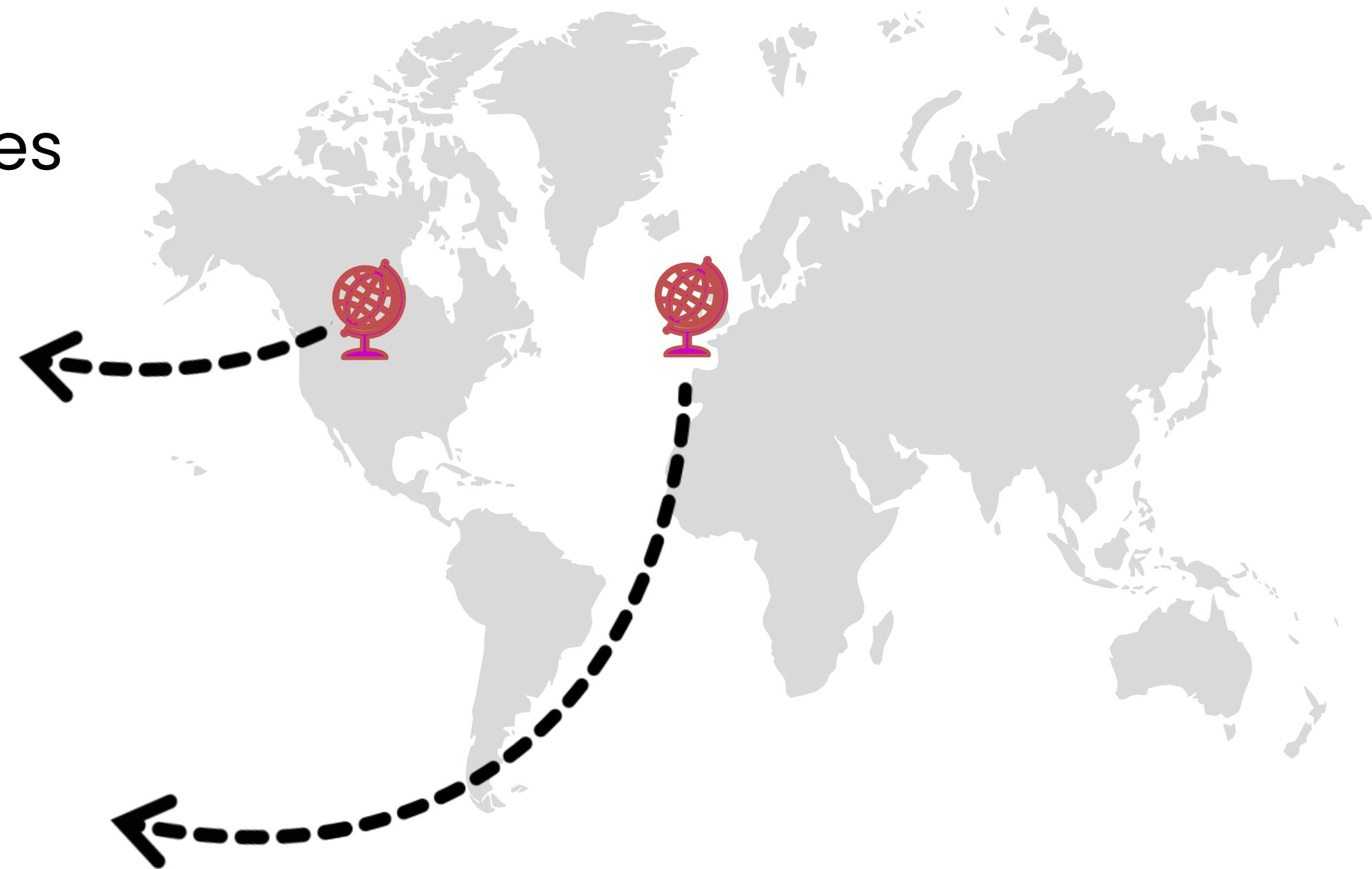
# Literature Review: Existence of the problem

It is estimated that annual incidence of SSI in the United States is 1.07%; with **8000 deaths** directly related to SSI and a financial cost of treatment to **\$10 billion**

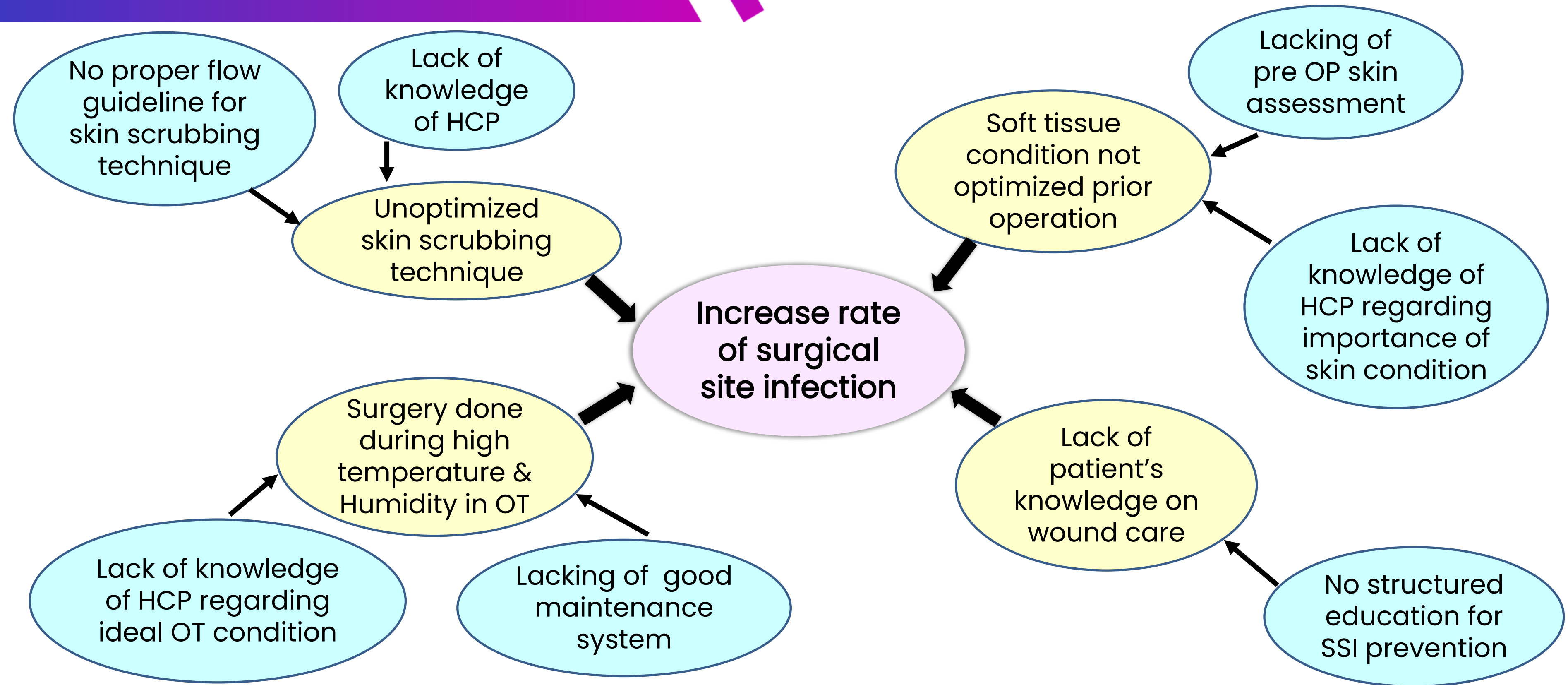
Scott RD 2009

In the United Kingdom, the length of the hospital stay increases between **5.8 and 17 extra days**

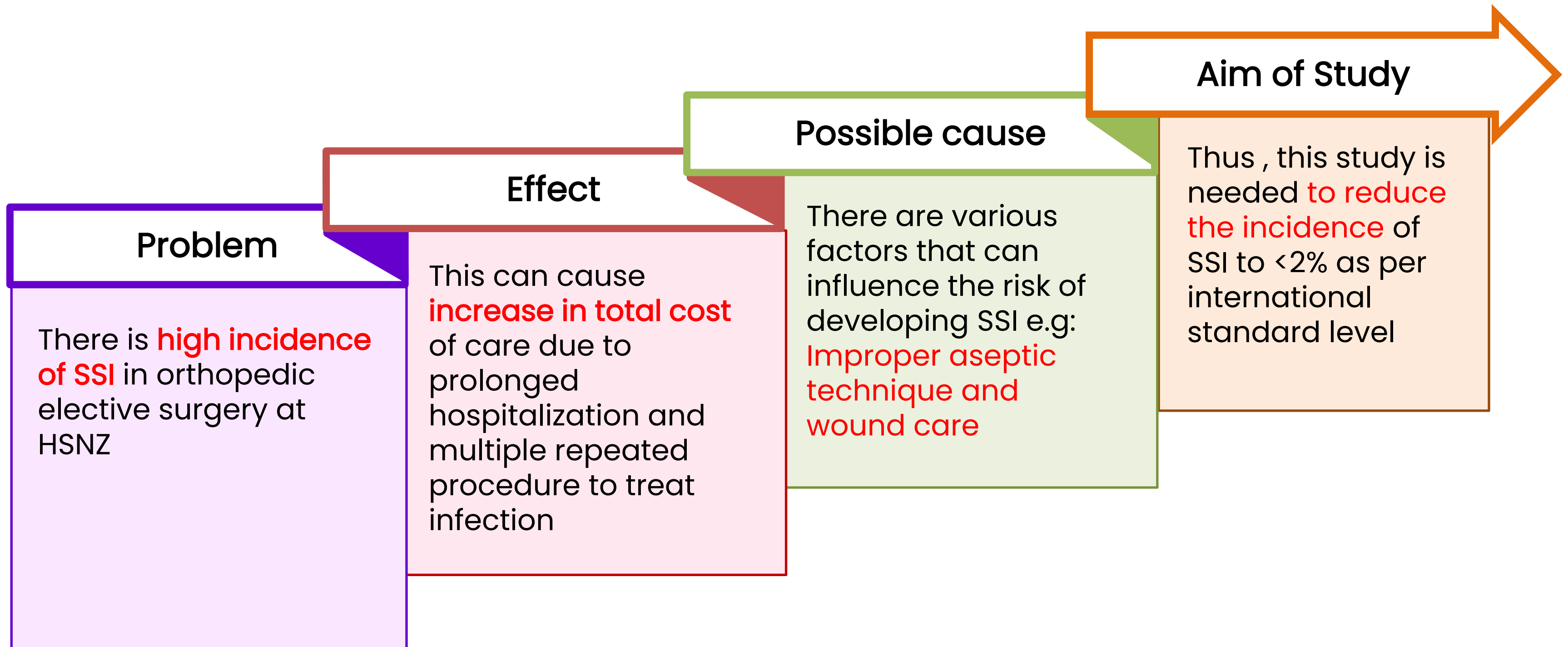
Geubbels EL 2000



# Problem Analysis Chart



# Problem Statement





# Gathering Information





# Objectives

## General

To reduce percentage of surgical site infection in orthopedic surgical procedure

## Specific

1. To determine the percentage of incidence surgical site infection in orthopedic elective surgery
2. To explore possible contributing factors that leads to increase rate of infection
3. To formulate strategies and implement appropriate remedial measures to decrease rate of infection
4. To re-evaluate the effectiveness of the remedial measures implemented

# Indicator, Criteria & Standard

## Indicator

### Percentage of surgical site infection

$$\frac{\text{Number of case complicated with SSI}}{\text{Total number of ELECTIVE surgery}} \times 100$$

## Criteria

### Inclusion criteria

All patient who underwent elective orthopedic surgery

### Exclusion criteria

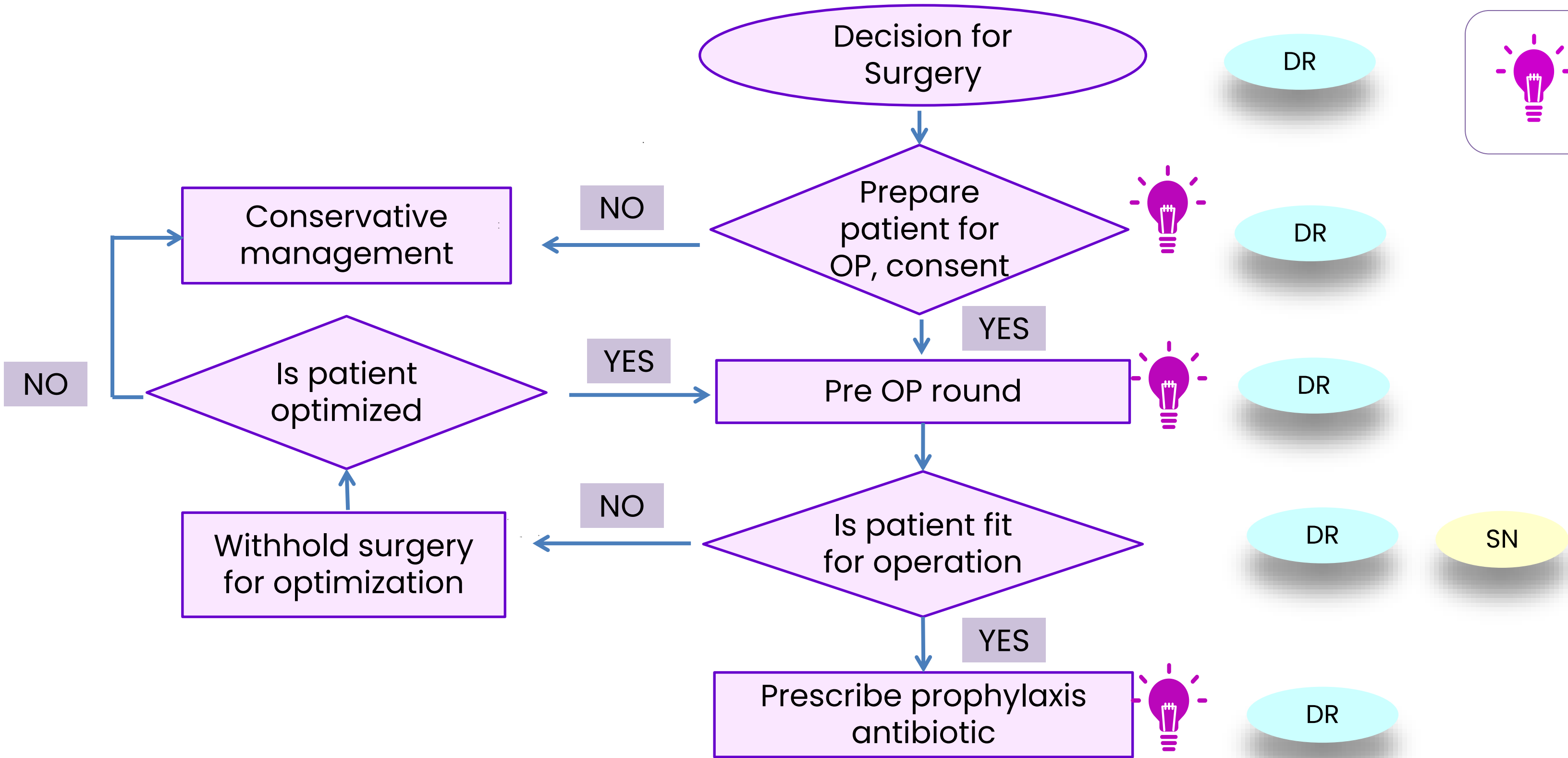
- Trauma patient with open fracture
- Immunocompromised patient
- Patient with mental disability
- Patient with lost of follow-up

## Standard

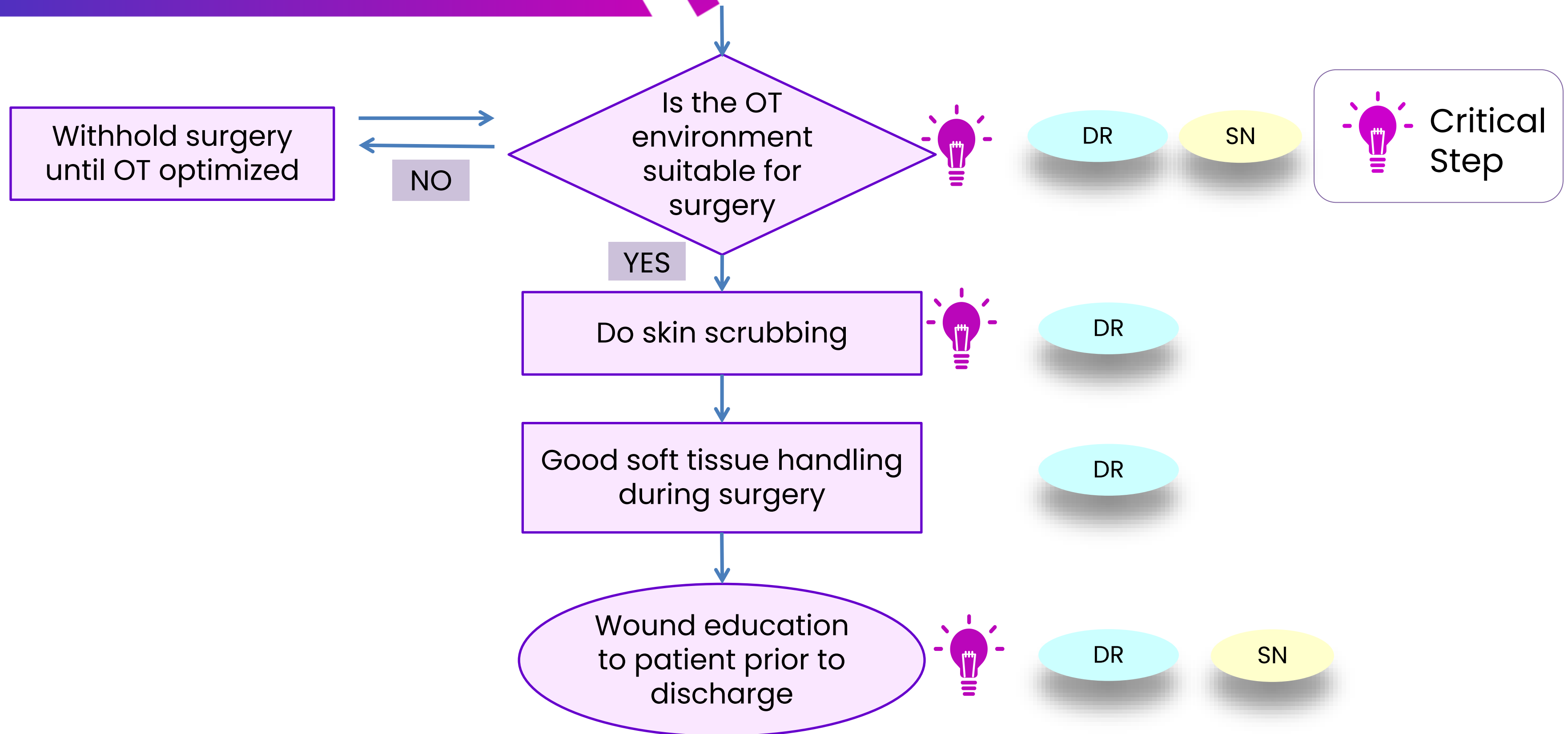
< 2%

Prevalence of Surgical Site Infection in Orthopedic Surgery: A 5-year Analysis, [Int Surg.](#) 2014 May-Jun; 99(3): 264-268. [10.9738/INTSURG-D-13-00251.1](https://doi.org/10.9738/INTSURG-D-13-00251.1)

# Process of Care



# Process of Care (continued)





# Model of Good Care

No.	Process	Criteria	Standard
1	Prepare patient for operation	<ul style="list-style-type: none"><li>• All patients should be fit and optimized for surgery:<ul style="list-style-type: none"><li>- General condition</li><li>- Blood results</li></ul></li><li>• All patients must have written consent for surgery</li></ul>	100%
2	Pre-op round	<ul style="list-style-type: none"><li>• Pre-op skin assessment must be done 12 hours prior surgery<ul style="list-style-type: none"><li>- All patients on POP need to be bivalve</li><li>- Skin must be free from severe bruise, swelling or skin infection</li></ul></li></ul>	100%
3	Prescribe prophylaxis antibiotics	<ul style="list-style-type: none"><li>• All patients must be prescribed with prophylaxis antibiotics according to antibiotic guidelines</li></ul>	100%

# Model of Good Care (continued)

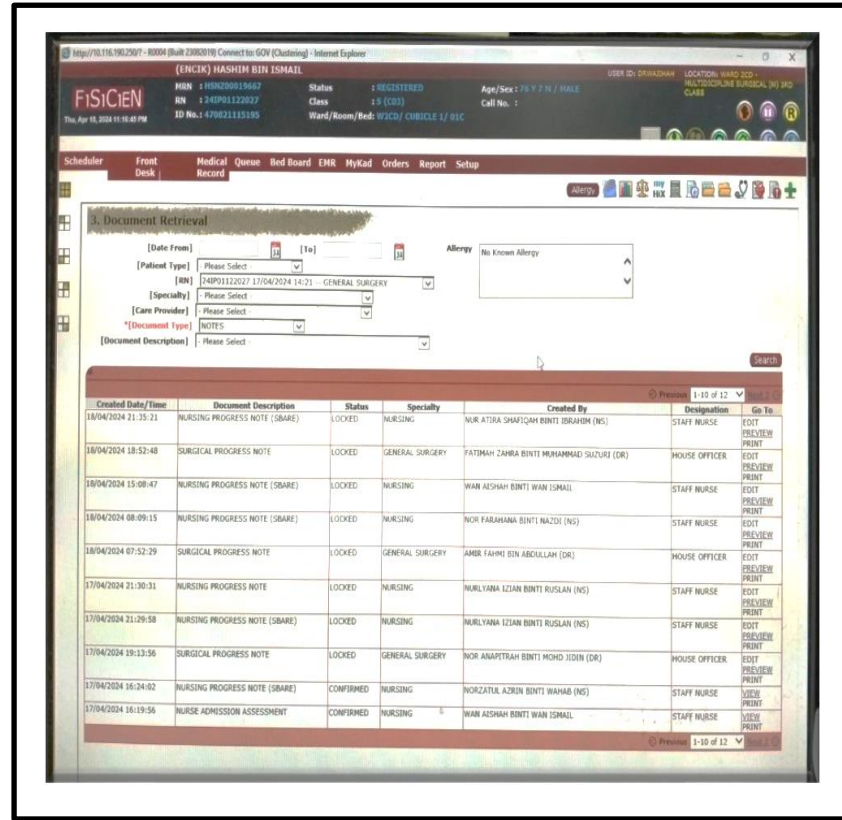
No.	Process	Criteria	Standard
4	Ensure normal operation theatre (OT) temperature and humidity	<ul style="list-style-type: none"><li>All operation theatre should fulfill the following conditions:<ul style="list-style-type: none"><li>Temperature range: 18 – 22 degree Celsius</li><li>Humidity range: 55 – 60%</li></ul></li></ul>	100%
5	Skin scrubbing	<ul style="list-style-type: none"><li>All patients should have a standard similar skin scrubbing technique i.e. using chlorhexidine + povidone solution</li></ul>	100%
6	Wound education to patient prior to discharge	<ul style="list-style-type: none"><li>All patients will be given education flyers on wound care</li></ul>	100%

# Methodology

PHASE	PHASE 1: Problem Verification	PHASE 2: Determining Contributing Factors	PHASE 3: Post Remedial Measures
Duration of Study	August 2020	August 2020 – September 2020	April 2022 – May 2022
Variables need to be collected	<p>Percentage of SSI in Orthopedic Department, HSNZ;</p> <ol style="list-style-type: none"> <li>Number of patient with SSI</li> <li>Number of elective surgery</li> </ol>	<ol style="list-style-type: none"> <li>Knowledge on SSI among:               <ol style="list-style-type: none"> <li>Doctors</li> <li>Staff Nurses</li> <li>Patients</li> </ol> </li> <li>Number of patients receiving prophylaxis antibiotics according to guideline</li> <li>Number of patients underwent pre-Op skin assessment done during pre-op round</li> <li>Number of patients with standard skin scrubbing prior operation</li> <li>Incidence of high OT Humidity &amp; Temperature</li> </ol>	<ol style="list-style-type: none"> <li>Percentage of SSI in Orthopedic Department, HSNZ</li> <li>Knowledge on SSI among:               <ol style="list-style-type: none"> <li>Doctors</li> <li>Staff Nurses</li> <li>Patients</li> </ol> </li> <li>Number of patients receiving prophylaxis antibiotics according to guideline</li> <li>Number of patients underwent pre-Op skin assessment done during pre-op round</li> <li>Number of patients with standard skin scrubbing prior operation</li> <li>Incidence of high OT Humidity &amp; Temperature</li> </ol>
Data collection tool	<ol style="list-style-type: none"> <li>Health Information System (HIS)</li> <li>'Buku Daftar Dewan Bedah'</li> </ol>	<ol style="list-style-type: none"> <li>Questionnaires</li> <li>Health Information System (HIS)</li> <li>'Buku Daftar Dewan Bedah'</li> <li>OT Book Record for humidity &amp; temperature monitoring</li> </ol>	
Sampling Technique	Convenience Sampling		
Method of Analysis	Data were analyzed quantitatively and presented as frequencies and percentages using Microsoft Excel		



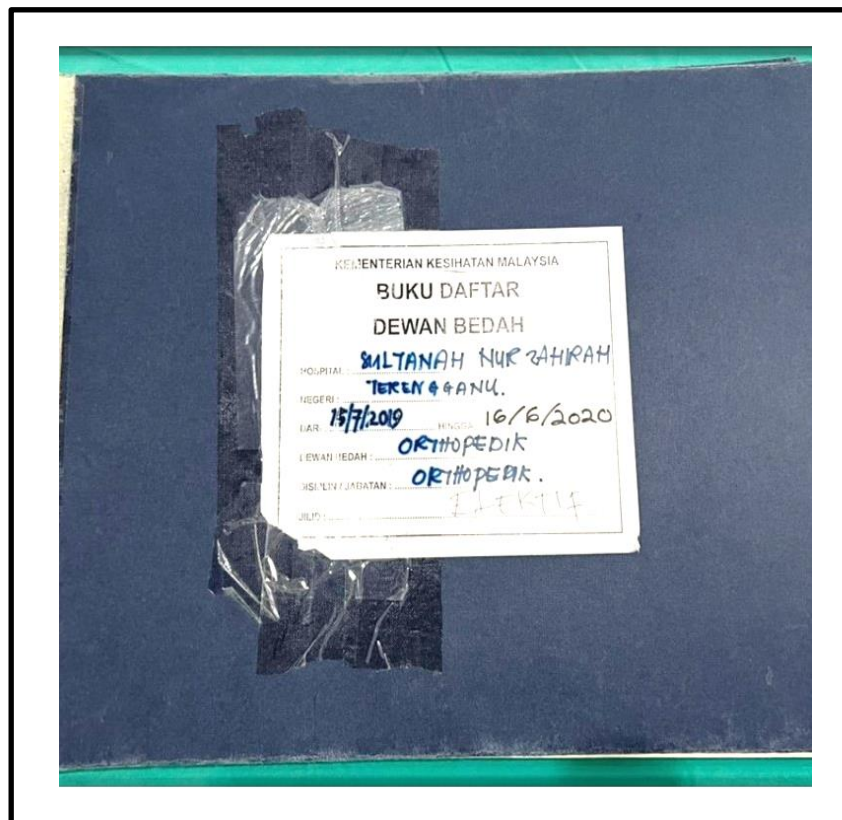
# Sampling Tools



## Health Information System (HIS)

Electronic Medical Record (EMR) providing all the details about patient including daily progress notes, investigations and medications given. Used to gather information on:

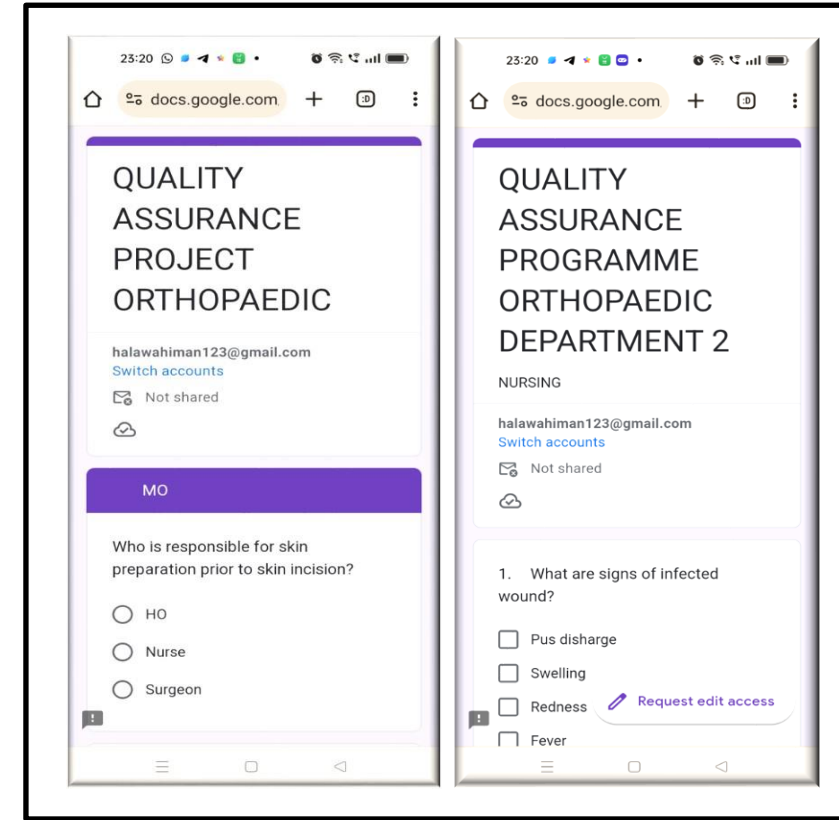
- Incidence SSI
- Pre-operative round
- Documentation of skin scrubbing



## “Buku Daftar Dewan Bedah”

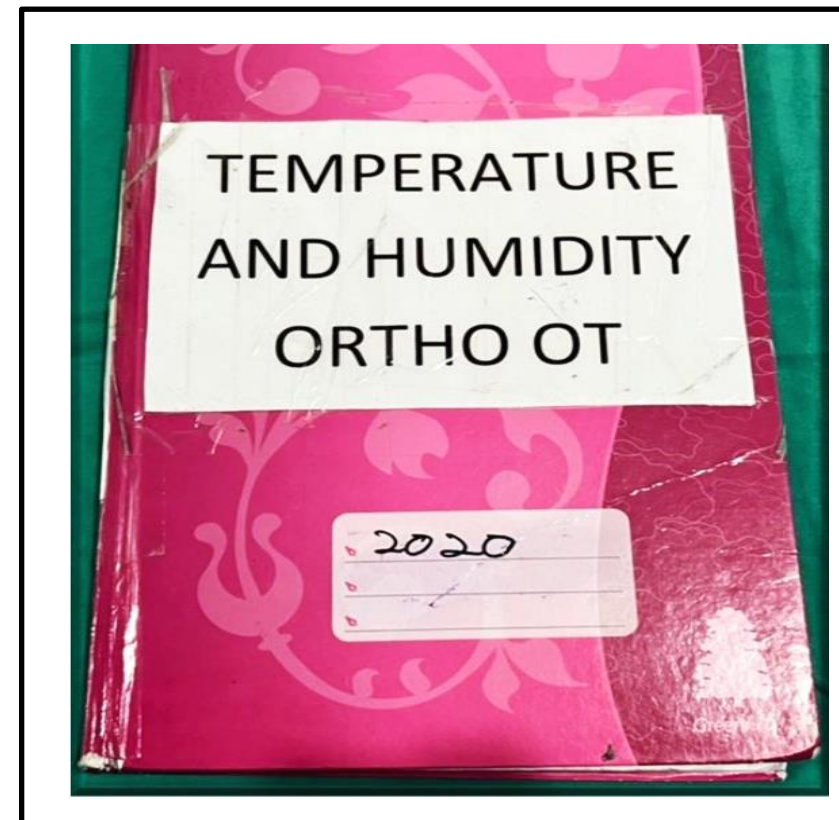
To provide primary data of all patients underwent elective surgeries in Orthopaedic Department at HSNZ

Data include details of patient, diagnosis and surgery undertaken



## Knowledge Assessment Questionnaires

- Consists of set of questions targeting doctors, nurses and patients in different google forms.
- Questions on SSI were verified by orthopedic specialists. To assess:
  - Knowledge on perioperative issues and wound care among healthcare workers
  - Knowledge of wound care among patients



## Temperature & Humidity OT Book Record

Consists of data of temperature & humidity monitoring record in orthopedic OT. To provide information on high temperature & humidity incidence in OT.



# Plan for Data Collection

Factor	Variables	Source of Data	Method of collection	Sample unit	Sample size	standard
Doing pre-op skin assessment	1. Number of patient done skin assessment during pre-op round	1. HIS system	1. Review HIS	1. Orthopedic elective surgery	1. All patient underwent elective surgery	100% done
	2. Knowledge on importance skin assessment prior op	2. Questionnaire	2. Self administered	2. Orthopedic healthcare personnel	2. All orthopedic medical officer	100% understood
Doing standard skin scrubbing technique	1. Number of patient received standard skin scrubbing	1. HIS system	1. Review HIS	1. Orthopedic elective surgery	1. All patient underwent elective surgery	100% received
	2. Knowledge on standard skin scrubbing	2. Questionnaire	2. Self administered	2. Orthopedic healthcare personnel	2. All orthopedic medical officer	100% understood
Ideal OT condition during surgery	1. Number of incidence high temperature & humidity in OT	1. OT Book Record for temperature % humidity monitoring	1. Review OT book record	1. Orthopedic elective surgery	1. All orthopedic elective surgery	1. 100% ideal condition
	2. Knowledge on ideal OT condition	2. Questionnaire	2. Self administered	2. Orthopedic healthcare personnel	2. All orthopedic medical officer	100% understood
Patient's knowledge on wound care	Knowledge on wound care	Questionnaire	Self administered	Patient in orthopedic ward underwent elective surgery	50 patients	100% understood

# Data Analysis



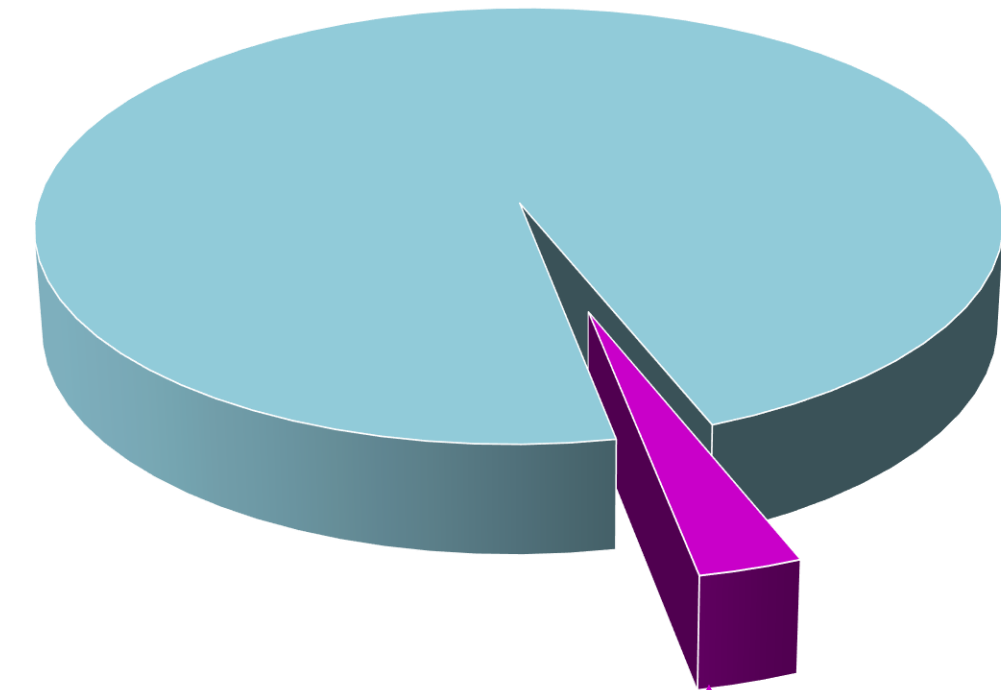
# Data Analysis: Problem Verification

Percentage of SSI cases in Orthopaedic Department HNSZ  
from January – June 2019

$$\frac{\text{Number of case complicated with SSI}}{\text{Total number of ELECTIVE surgery}} \times 100$$

$$\frac{13}{434} \times 100 = 2.995\%$$

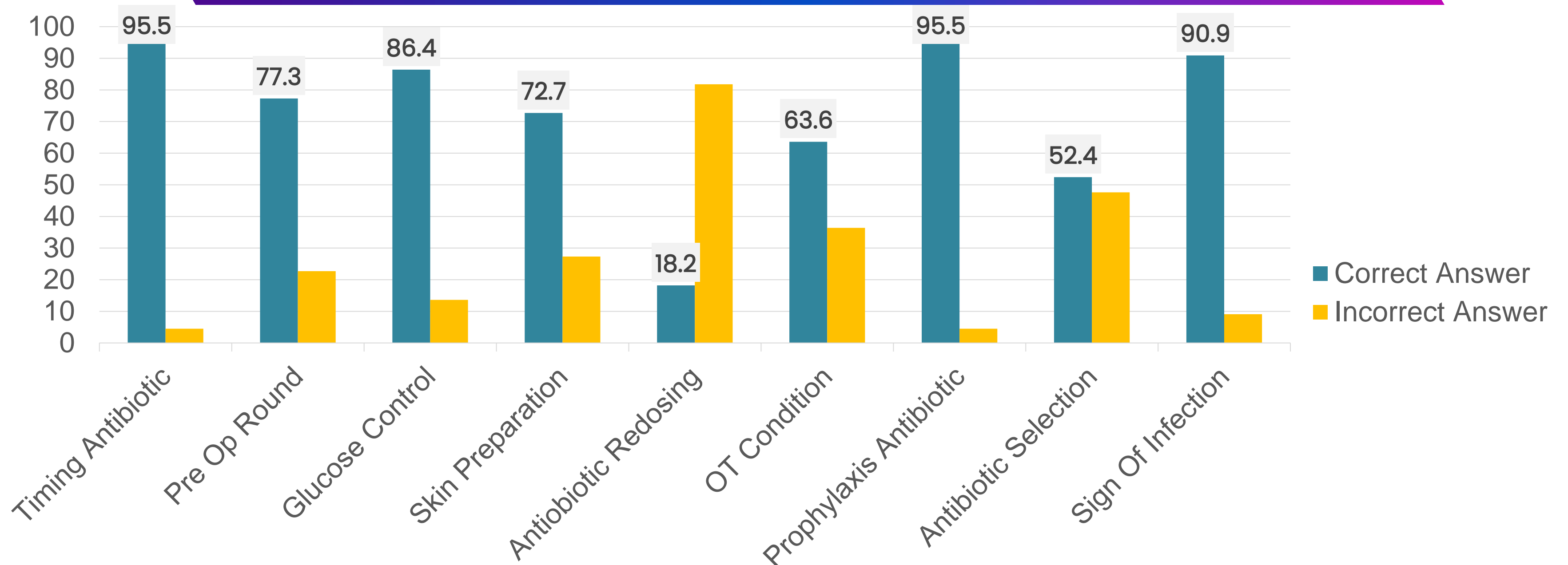
Standard: < 2%





# Data Analysis: Determining Contributing Factors

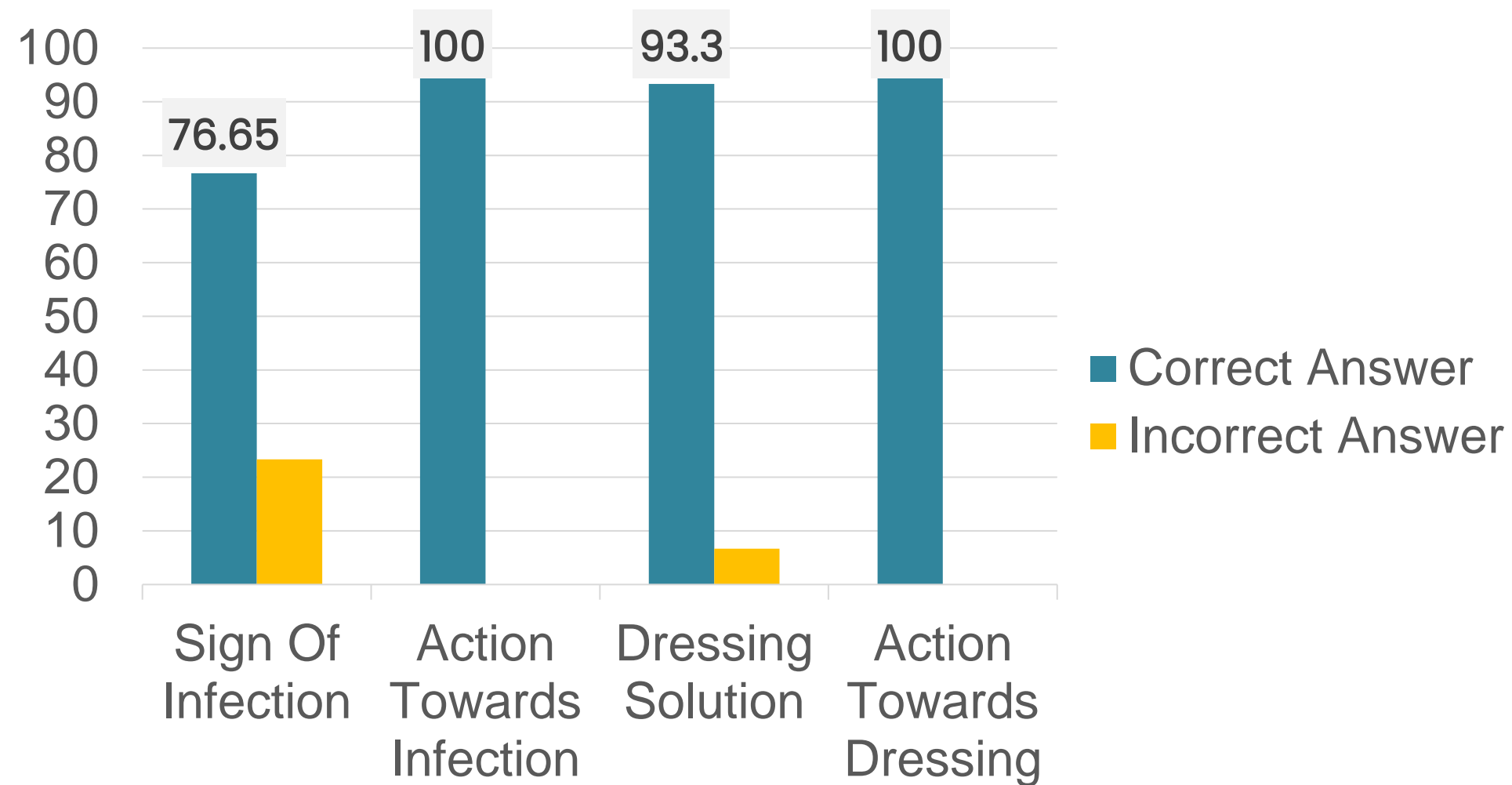
## Percentage of Knowledge on SSI Among Doctors



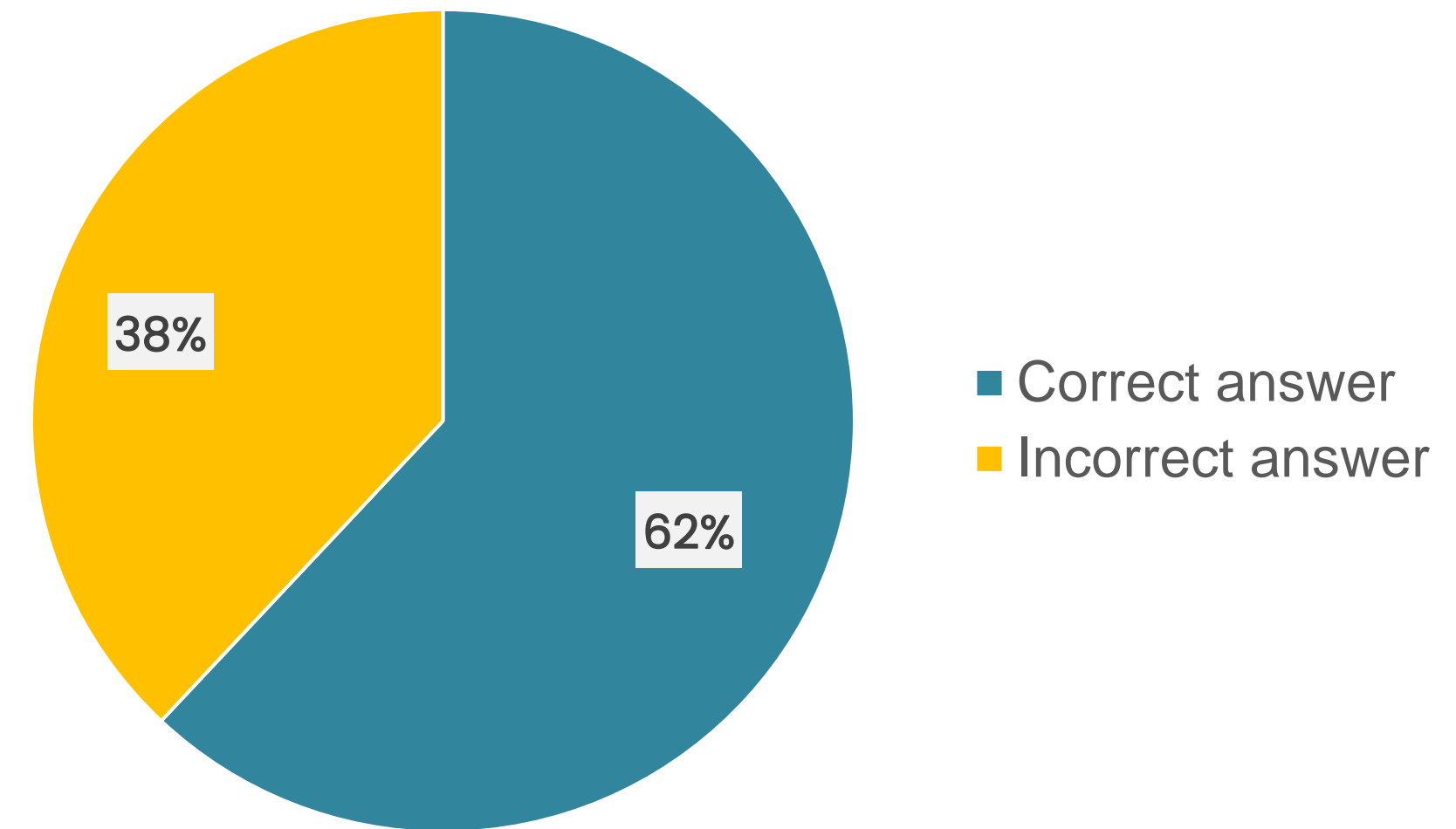


# Data Analysis: Determining Contributing Factors

## Percentage of Knowledge on SSI Among Staff Nurses

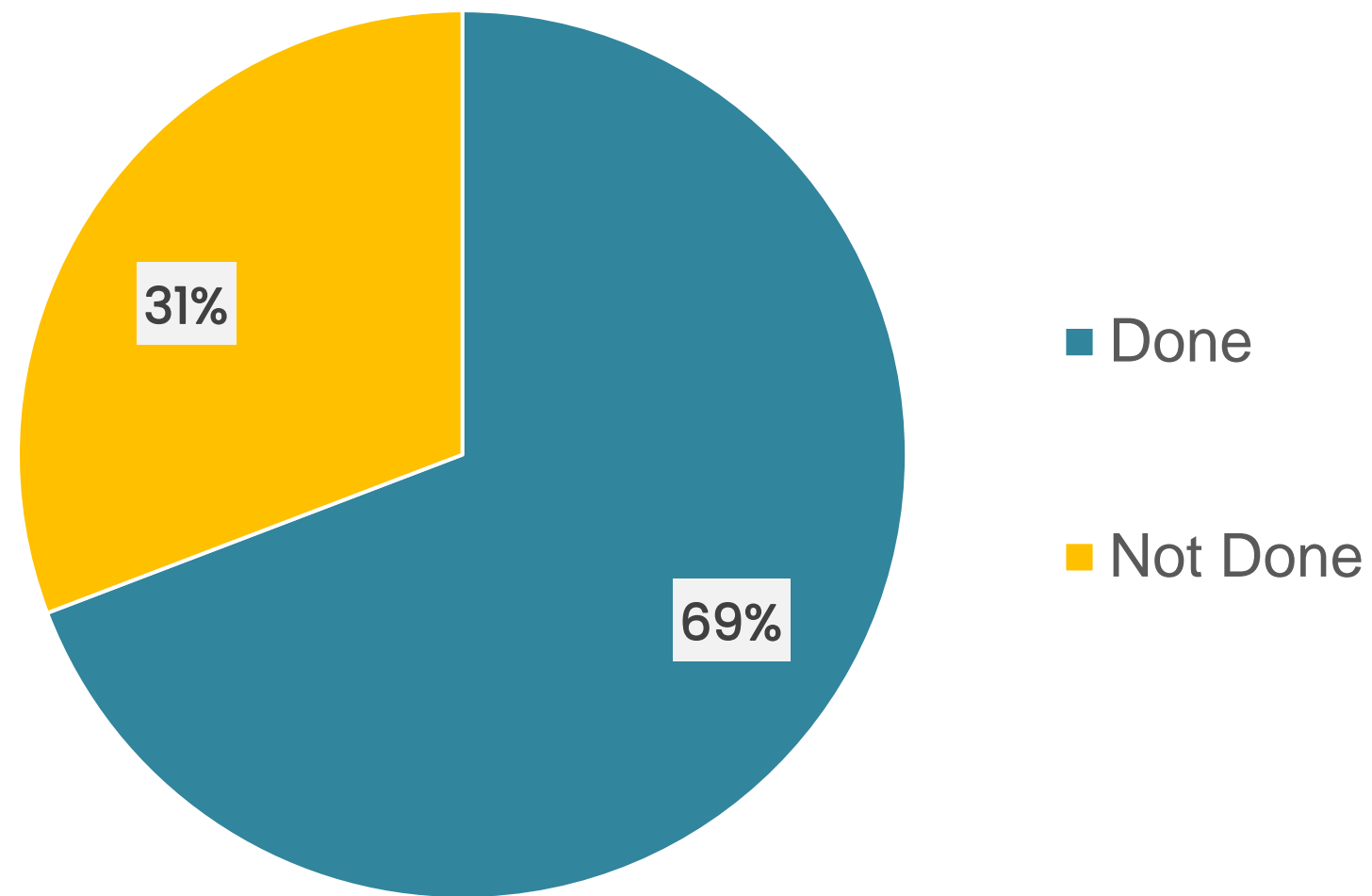


## Percentage of Knowledge on SSI Among Patients

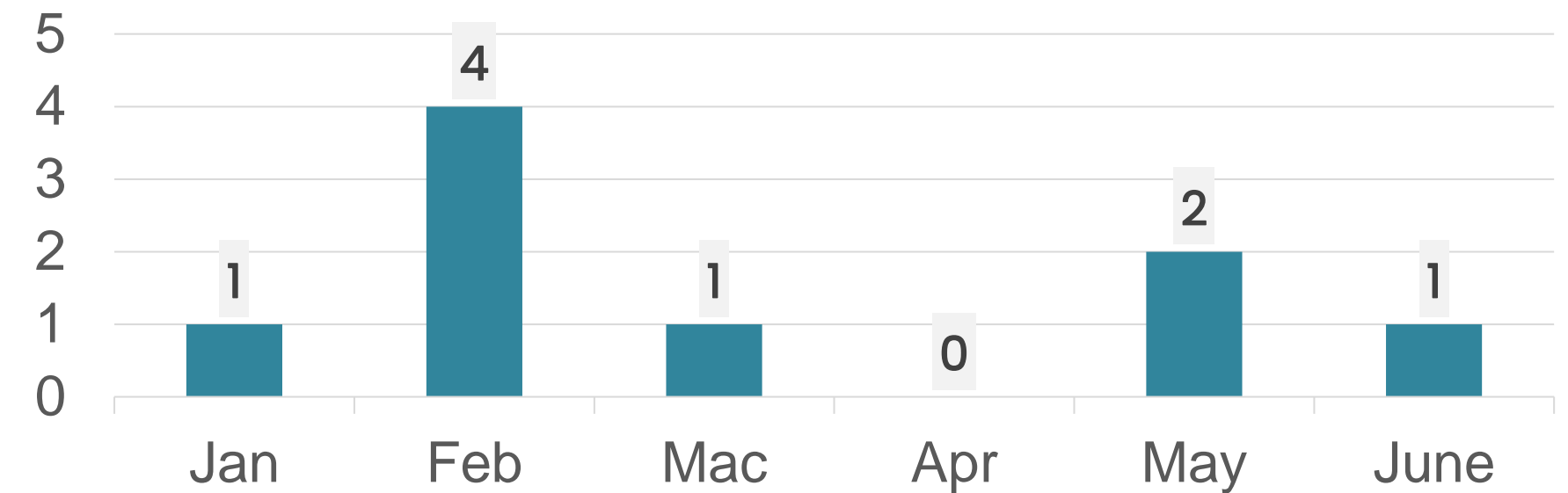


# Data Analysis: Determining Contributing Factors

## Percentage of Pre-Op Skin Assessment done during Pre-Op Round



## Incidence of high OT Humidity & Temperature Jan-June 2019



Total Incidence: **9 cases** within 6 months

# Data Analysis: Confirmation to MOGC

No.	Process	Criteria	Standard	Pre-Remedial
1	Prepare patient for operation	<ul style="list-style-type: none"><li>All patients should be fit and optimized for surgery:<ul style="list-style-type: none"><li>- General condition</li><li>- Blood results</li></ul></li><li>All patients must have written consent for surgery</li></ul>	100%	100%
2	Pre-op round	<ul style="list-style-type: none"><li>Pre-op skin assessment must be done 12 hours prior surgery<ul style="list-style-type: none"><li>- All patients on POP need to be bivalve</li><li>- Skin must be free from severe bruise, swelling or skin infection</li></ul></li></ul>	100%	69.2%
3	Prescribe prophylaxis antibiotics	<ul style="list-style-type: none"><li>All patients must be prescribed with prophylaxis antibiotics according to antibiotic guidelines</li></ul>	100%	100%

# Data Analysis: Conformation to MOGC

No.	Process	Criteria	Standard	Pre-Remedial
4	Ensure normal operation theatre (OT) temperature and humidity	<ul style="list-style-type: none"><li>All operation theatre should fulfill the following conditions:<ul style="list-style-type: none"><li>Temperature range: 18 – 22 degree Celsius</li><li>Humidity range: 55 – 60%</li></ul></li></ul>	100%	97%
5	Skin scrubbing	<ul style="list-style-type: none"><li>All patients should have a standard similar skin scrubbing technique i.e. using chlorhexidine + povidone solution</li></ul>	100%	0%
6	Wound education to patient prior to discharge	<ul style="list-style-type: none"><li>All patients will be given education flyers on wound care</li></ul>	100%	0%

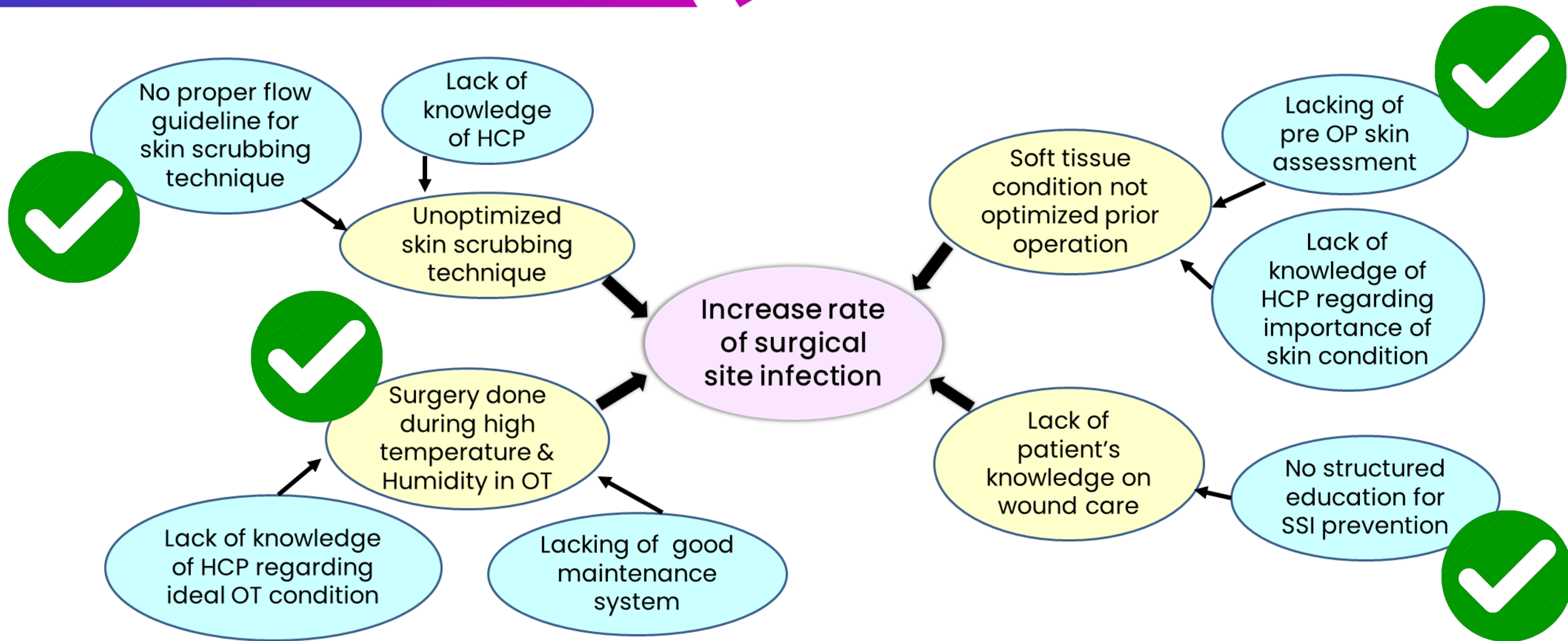


# Strategies for Change





# Remedial 1: Peri-Operative Checklist



# Remedial 1:

## Peri-Operative Checklist

3 Sections :

### Pre-operative

To be filled by medical officer who did the pre-op round

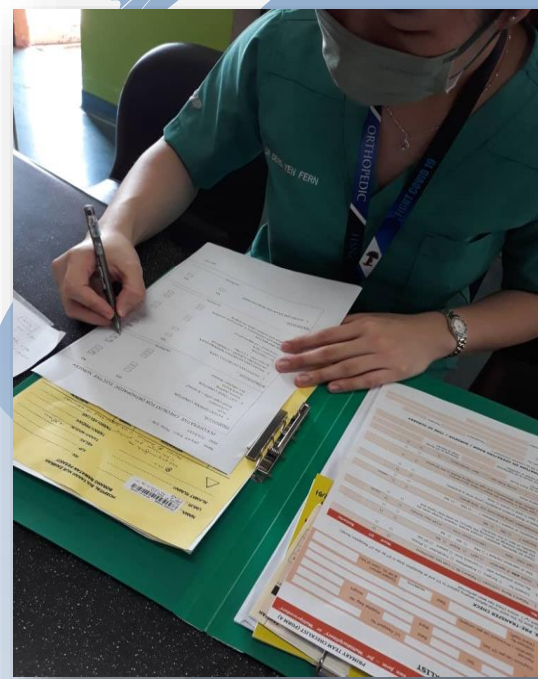
### Intra-operative

To be filled by medical officer who involved in the surgery

### Post-operative

To be filled by house officer who did the discharge summary

**Factor:** Unoptimized skin condition, poor skin scrubbing technique, unideal OT environment & poor wound knowledge



### PERIOPERATIVE CHECKLIST FOR ORTHOPAEDIC ELECTIVE SURGERY

#### PREOPERATIVE

	YES	NO
<b>1. PATIENT GENERAL CONDITION</b>		
Fever	<input type="checkbox"/>	<input type="checkbox"/>
Leucocytosis	<input type="checkbox"/>	<input type="checkbox"/>
Blood sugar profile <8 mmol/l	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. SOFT TISSUE CONDITION</b>		
Severe swelling	<input type="checkbox"/>	<input type="checkbox"/>
Severe bruises	<input type="checkbox"/>	<input type="checkbox"/>
Skin infection/disease	<input type="checkbox"/>	<input type="checkbox"/>
Verified by : _____		

#### INTRAOPERATIVE

	YES	NO
<b>1. PROPHYLAXIS ANTIBIOTICS GIVEN</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. PROPHYLAXIS ANTIBIOTICS REDOSING GIVEN (IN PROLONG SURGERY &gt; 4 HOURS OR BLOOD LOSS &gt; 1.5 LITRE)</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. OT CONDITION</b>		
Humidity <60%	<input type="checkbox"/>	<input type="checkbox"/>
Temperature <22 degree celcius	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. SKIN PREPARATION</b>		
Cleaned with chlorhexidine in alcohol prior scrubbing	<input type="checkbox"/>	<input type="checkbox"/>
Cleaned with povidone iodine prior draping	<input type="checkbox"/>	<input type="checkbox"/>
Verified by : _____		

#### POSTOPERATIVE

	YES	NO
<b>1. WOUND CARE EDUCATION PRIOR DISCHARGE</b>	<input type="checkbox"/>	<input type="checkbox"/>
Verified by : _____		

# Remedial 1.

## Peri-Op

3 Section  
Pre-operative  
To be filled  
pre-op room

Intra-operative  
To be filled  
involved

Post-operative  
To be filled  
discharge

Factor : un

scrubbing technique, unideal OT environment & poor wound knowledge



### PERIOPERATIVE CHECKLIST FOR ORTHOPAEDIC ELECTIVE SURGERY

#### PREOPERATIVE

##### 1. PATIENT GENERAL CONDITION

Fever

Leucocytosis

Blood sugar profile <8 mmol/l

YES

NO

##### 2. SOFT TISSUE CONDITION

Severe swelling

Severe bruises

Skin infection/disease

Verified by : \_\_\_\_\_

ORTHOPAEDIC ELECTIVE SURGERY

NO

NO

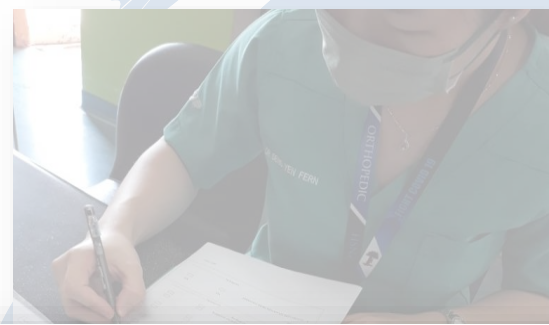
NO

Verified by : \_\_\_\_\_



# Remedial 1:

## Peri-Operative Checklist



### PERIOPERATIVE CHECKLIST FOR ORTHOPAEDIC ELECTIVE SURGERY

#### INTRAOPERATIVE

1. PROPHYLAXIS ANTIBIOTICS GIVEN

YES

NO

2. PROPHYLAXIS ANTIBIOTICS REDOSING GIVEN  
(IN PROLONG SURGERY > 4 HOURS OR  
BLOOD LOSS > 1.5 LITRE)

3. OT CONDITION

Humidity <60%

Temperature <22 degree celcius

4. SKIN PREPARATION

Cleaned with chlorhexidine in alcohol prior scrubbing

Cleaned with povidone iodine prior draping

Verified by : \_\_\_\_\_

YES

NO

Verified by : \_\_\_\_\_

YES

NO

Verified by : \_\_\_\_\_

YES

NO

Verified by : \_\_\_\_\_

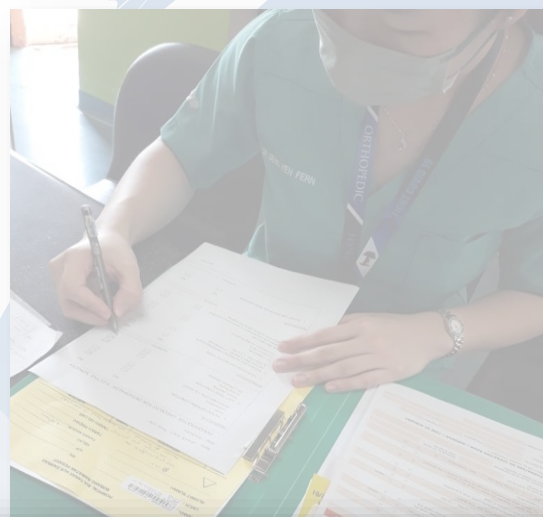
3 Sect  
Pre-op  
To be  
pre-o

Intra-  
To be  
involv

Post-o  
To be  
discho

Factor  
scrubbing technique, unideal OT environment &  
poor wound knowledge

# Remedial 1: Peri-Operative Checklist



## PERIOPERATIVE CHECKLIST FOR ORTHOPAEDIC ELECTIVE SURGERY

### PREOPERATIVE

#### 1. PATIENT GENERAL CONDITION

Fever

YES

NO

NO

### POSTOPERATIVE

#### 1. WOUND CARE EDUCATION PRIOR DISCHARGE

YES

NO

Verified by : \_\_\_\_\_

### POSTOPERATIVE

#### 1. WOUND CARE EDUCATION PRIOR DISCHARGE

YES

NO

Verified by : \_\_\_\_\_

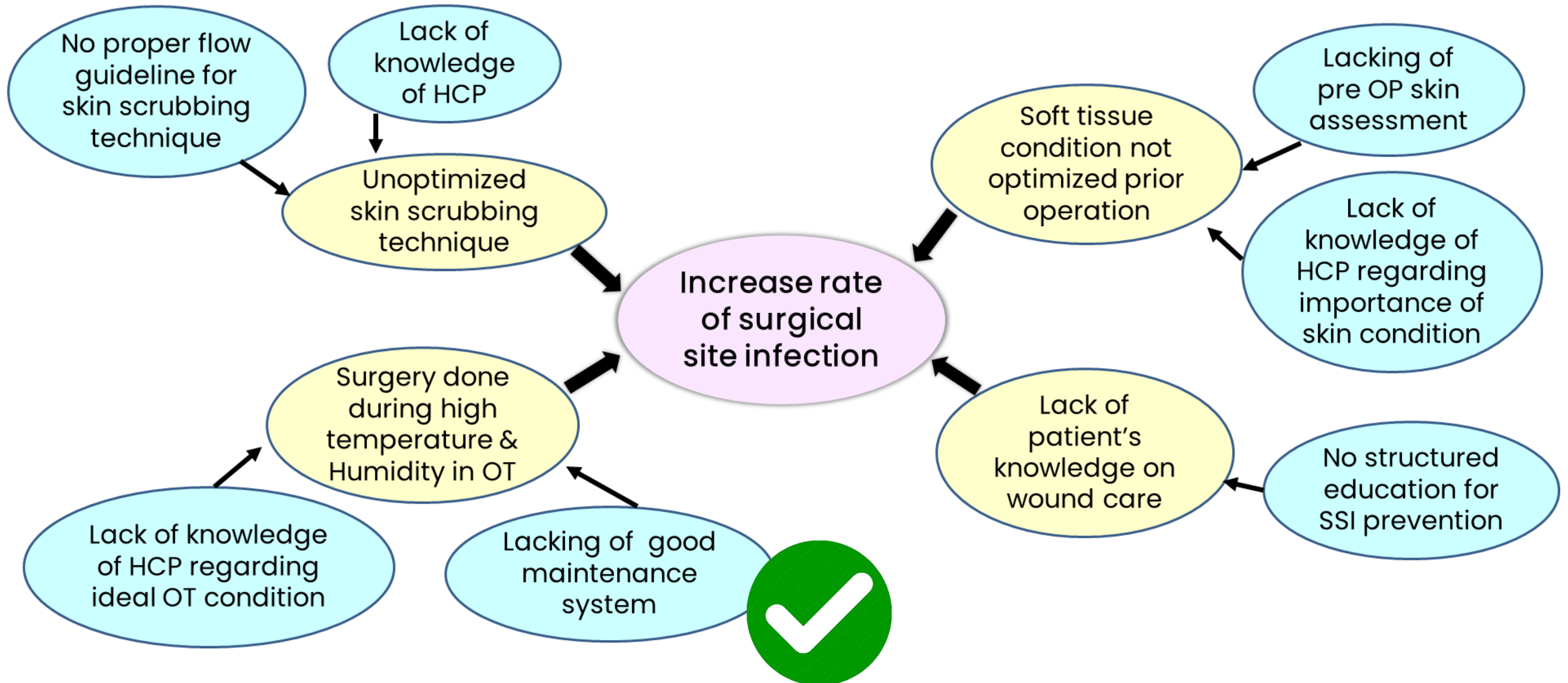
3 Section  
Pre-operative  
To be filled  
pre-op room

Intra-operative  
To be filled  
involved

Post-operative  
To be filled  
discharge summary

Factor : unoptimized skin condition, poor skin scrubbing technique, unideal OT environment & poor wound knowledge

# Remedial 2: Wind Blue





# Remedial 2:

## Wind Blue

- Upgraded temperature & humidity monitoring tool
- More accurate and efficient
- Can be monitored directly by *Radicare* – can detect abnormality in system during monitoring, thus preventing incidence
- KKM approved, calibrated
- Hygrometer was used prior to remedial which has slower detection & no direct monitoring

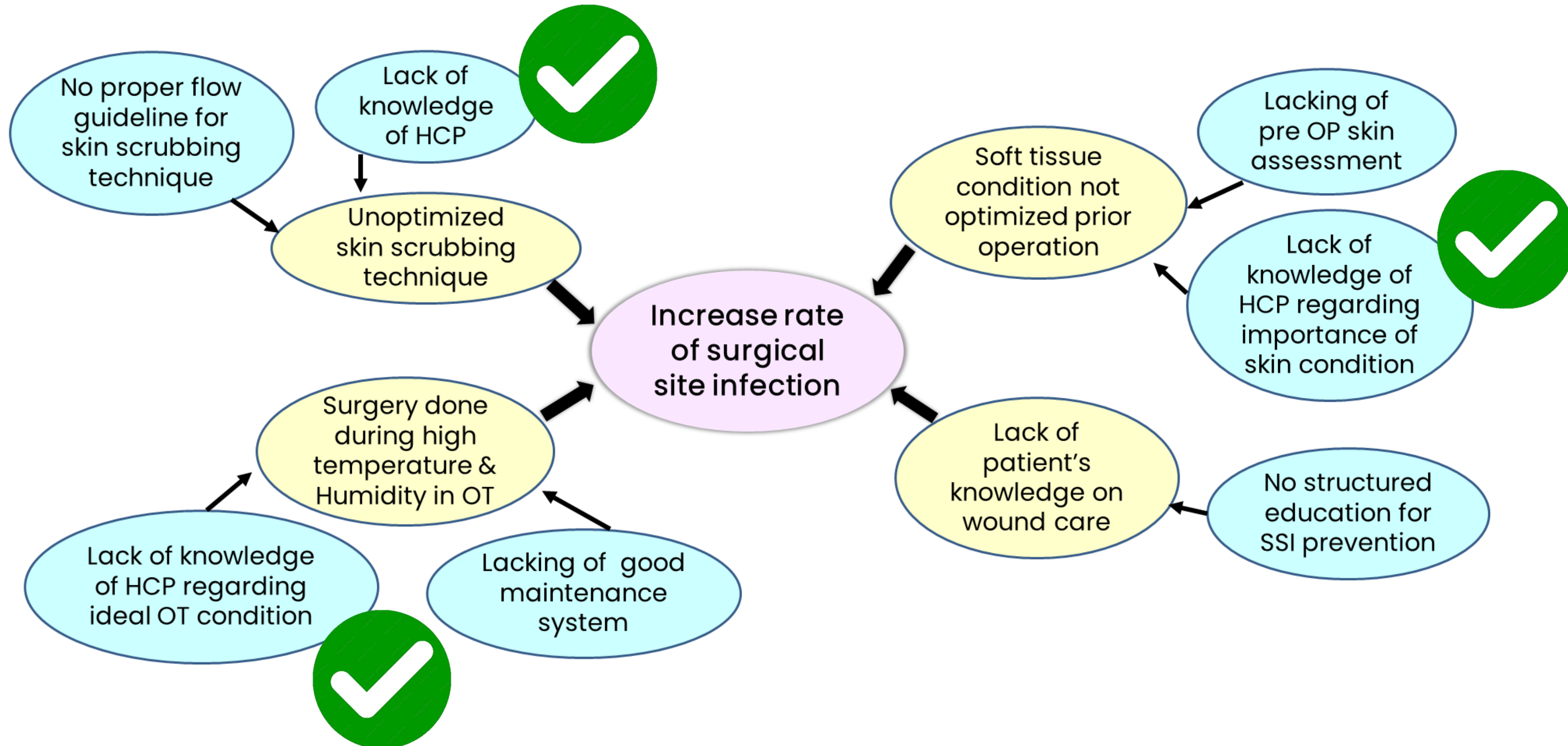
Factor: High OT temperature & humidity





# Remedial 3: Educational Session

## Remedial 4: Informative Banner





# Remedial 3:

## Educational Session

### Online CME

- Given to all medical officer and nurses
- 50 participants
- Objectives covered :
  - ✓ Ideal patient condition pre-operative
  - ✓ Ideal OT condition intra-operative
  - ✓ Skin scrubbing technique
- Questionnaire was conducted pre and post intervention

**Factor:** Unoptimized skin condition, poor skin scrubbing technique, unideal OT environment

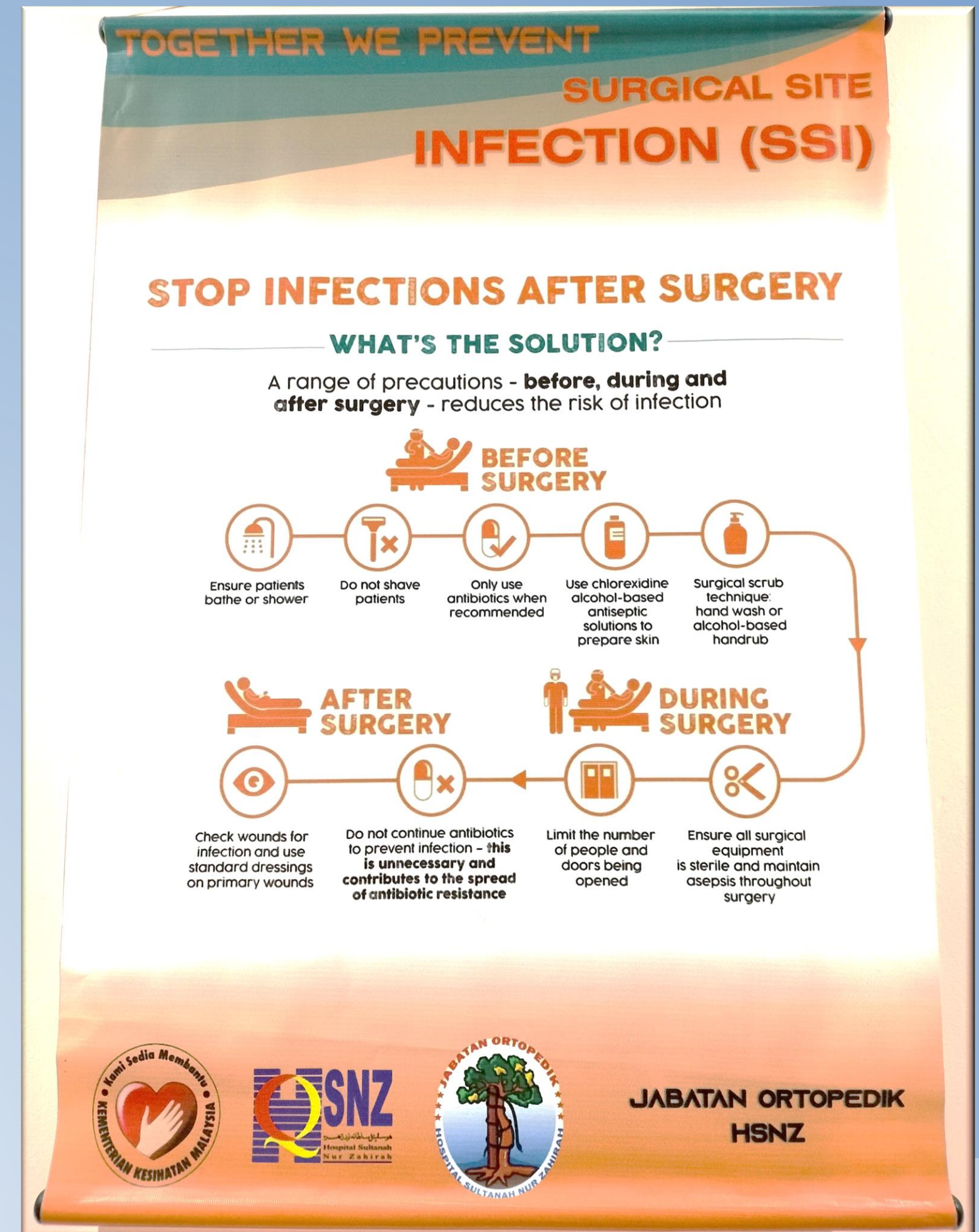




# Remedial 4: Informative Banner

- Continuous reminding all staff to be aware of SSI
- Thus, implementing correct SOP during daily works
- Placed at strategic area : Ward, Clinic and OT

**Factor:** Unoptimized skin condition, poor skin scrubbing technique, unideal OT environment





# Remedial 4: Informative Banner



Operation Theatre



Orthopedic Ward

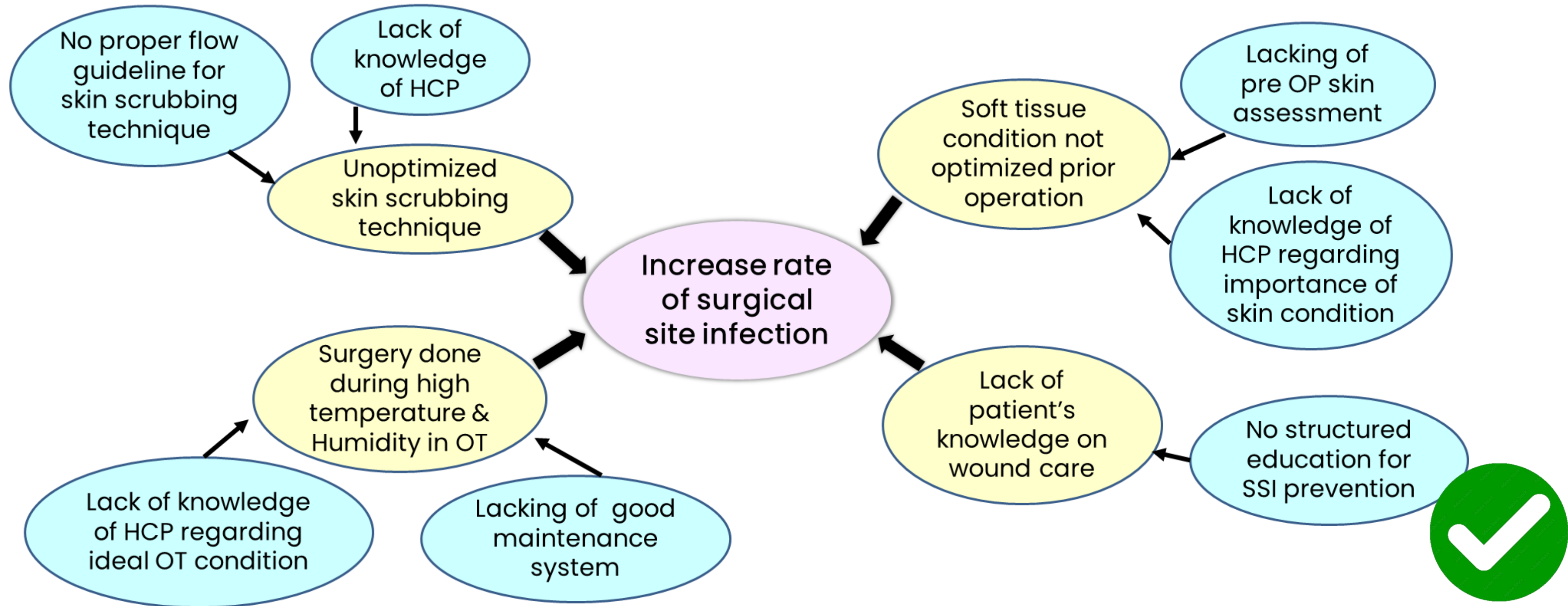


Orthopedic Clinic



# Remedial 5: Interactive Videos

## Remedial 6: Flyers



# Remedial 5: Interactive Videos

- Offering illustrative explanations on SSI and wound care on huge volume of patients and caregivers
- Played in orthopedic clinic and ward



Factor : patient's knowledge on wound care



# Remedial 6:

## Flyers

- Given to patient and caregivers in ward
- To aid in understanding and retain the information
- To ensure patient following dressing care as scheduled

Factor: Patient's knowledge on wound care



**TIPS PENJAGAAN LUKA**

Segera dapatkan rawatan jika:

- Luka berbau
- Luka bernanah atau mengeluarkan cecair
- Luka kemerahan, bengkak
- Jahitan luka terbuka
- Demam yang tiada punca

◇Kawal bacaan gula untuk pesakit diabetes  
◇Sentiasa pastikan luka berbalut  
◇Melakukan cucian dan buka jahitan luka di klinik mengikut jadual

**Luka sihat**      **Luka tidak sihat**



# Strategies for Change

## In Summary

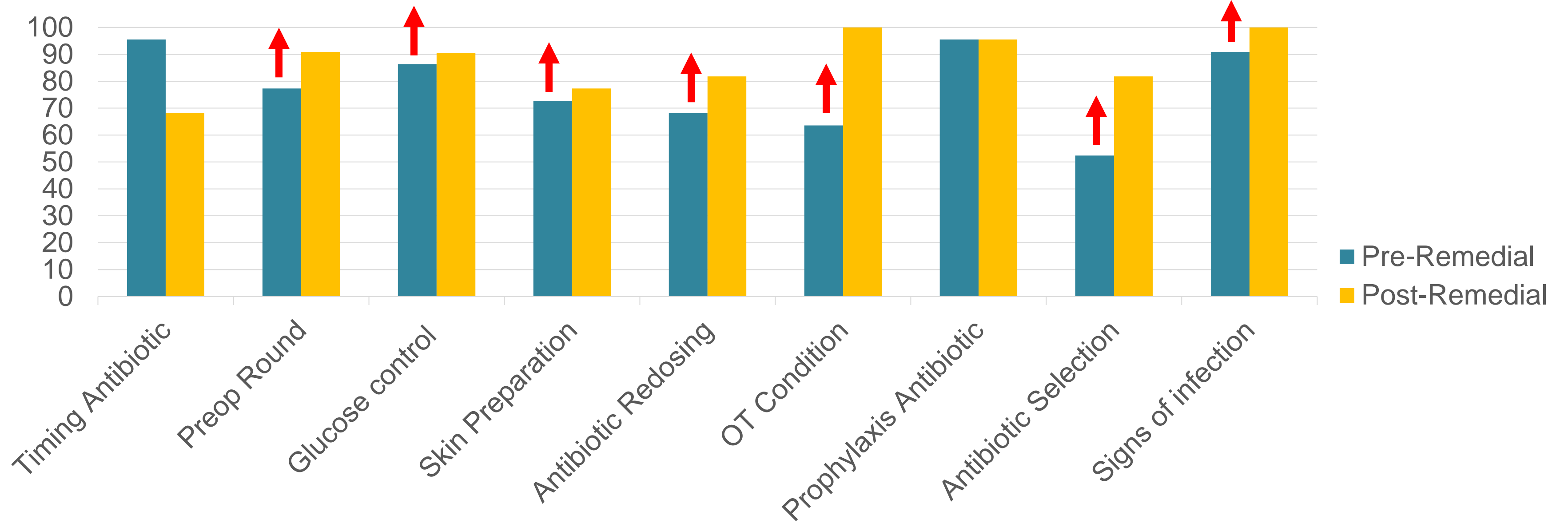
Factor	Strategies for Change
1. Soft tissue condition not optimized prior operation	✓ Perioperative checklist ✓ Online CME ✓ Informative banner
2. Unoptimized skin scrubbing technique	✓ Perioperative checklist ✓ Online CME ✓ Informative banner
3. Surgery done during high temperature & humidity in OT	✓ Perioperative checklist ✓ Online CME ✓ Informative banner ✓ Wind Blue
4. Lack of patient's knowledge on wound care	✓ Perioperative checklist ✓ Interactive videos ✓ Flyers

# Effects of Change



# Effects of Change: Knowledge of SSI Among Doctors

## Percentage of Knowledge on SSI Among Doctors (with correct answer)

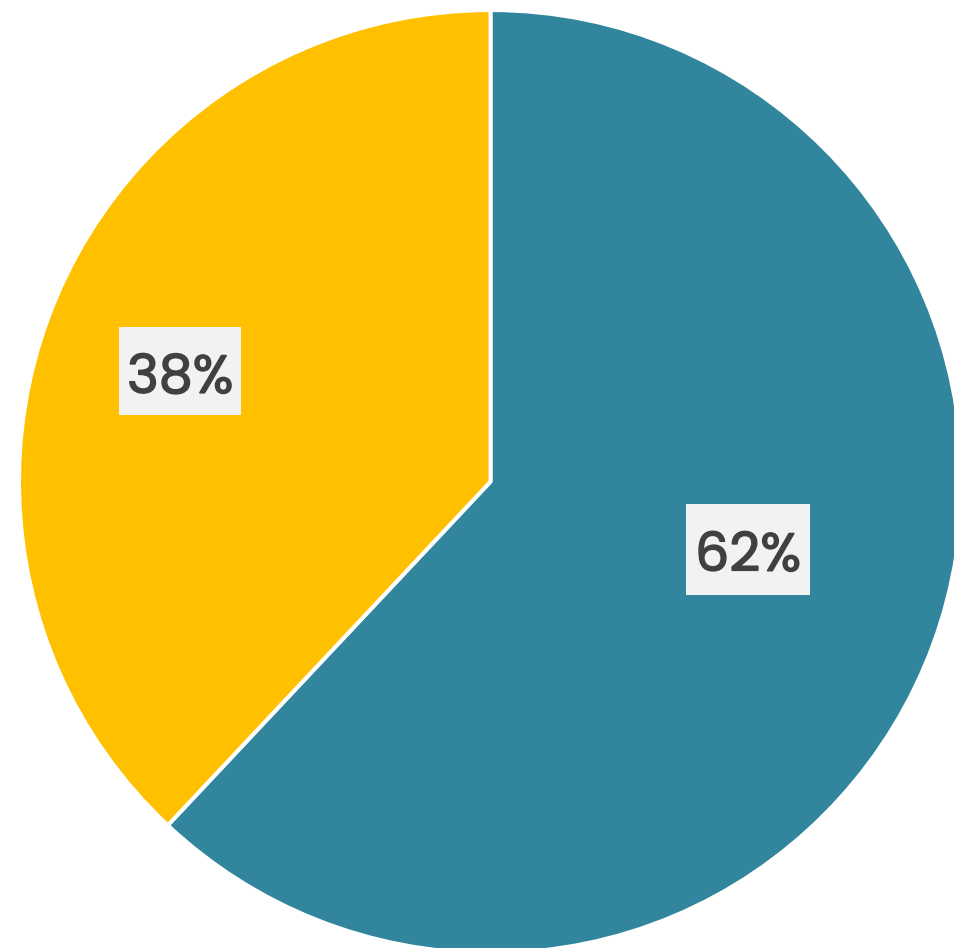




# Effects of Change: Knowledge of Wound Care Among Patients

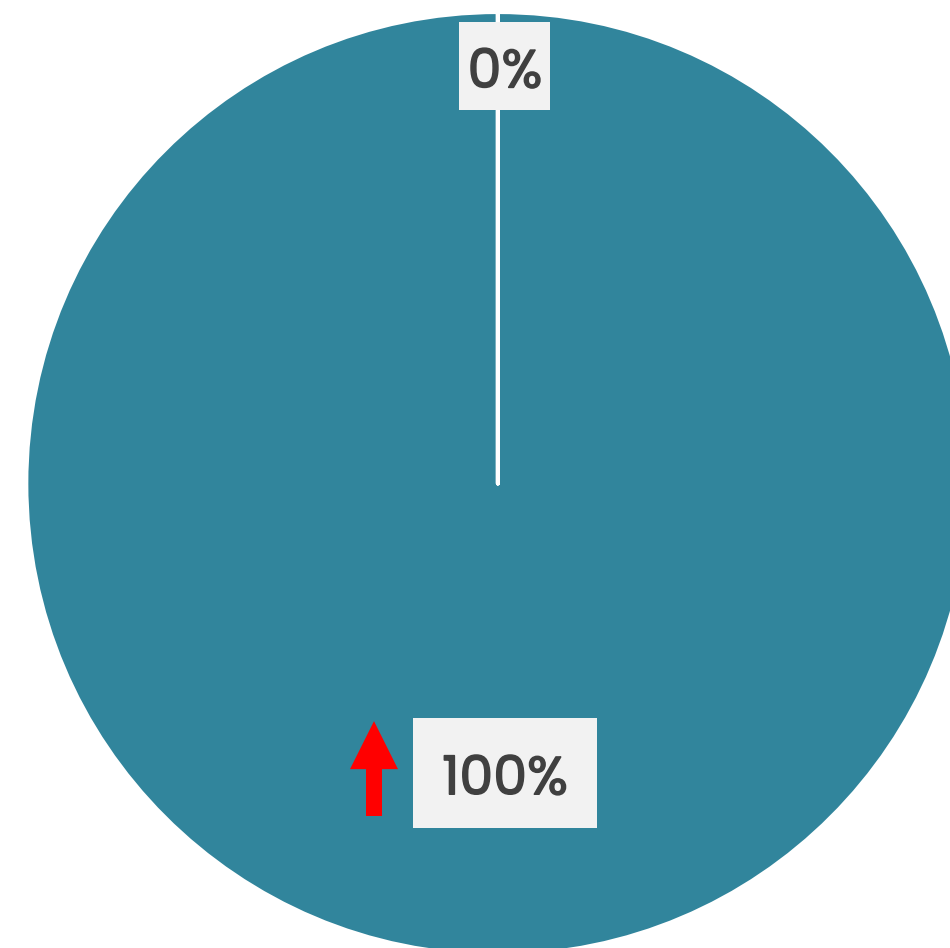
## Percentage of Knowledge on Wound Care Among Patients (with correct answer)

### PRE-REMEDIAL



- Correct answer
- Incorrect answer

### POST-REMEDIAL

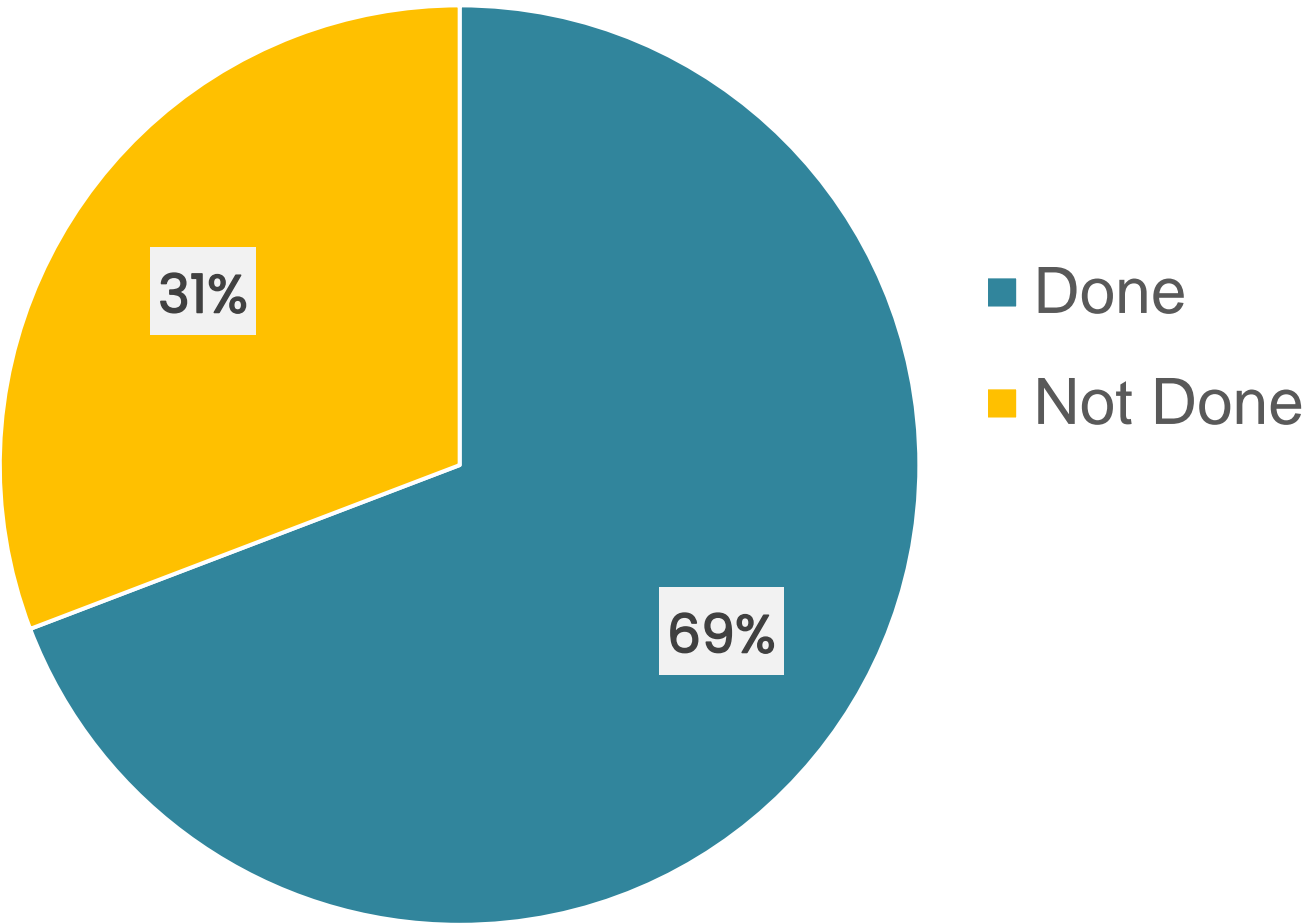


- Correct answer
- Incorrect answer

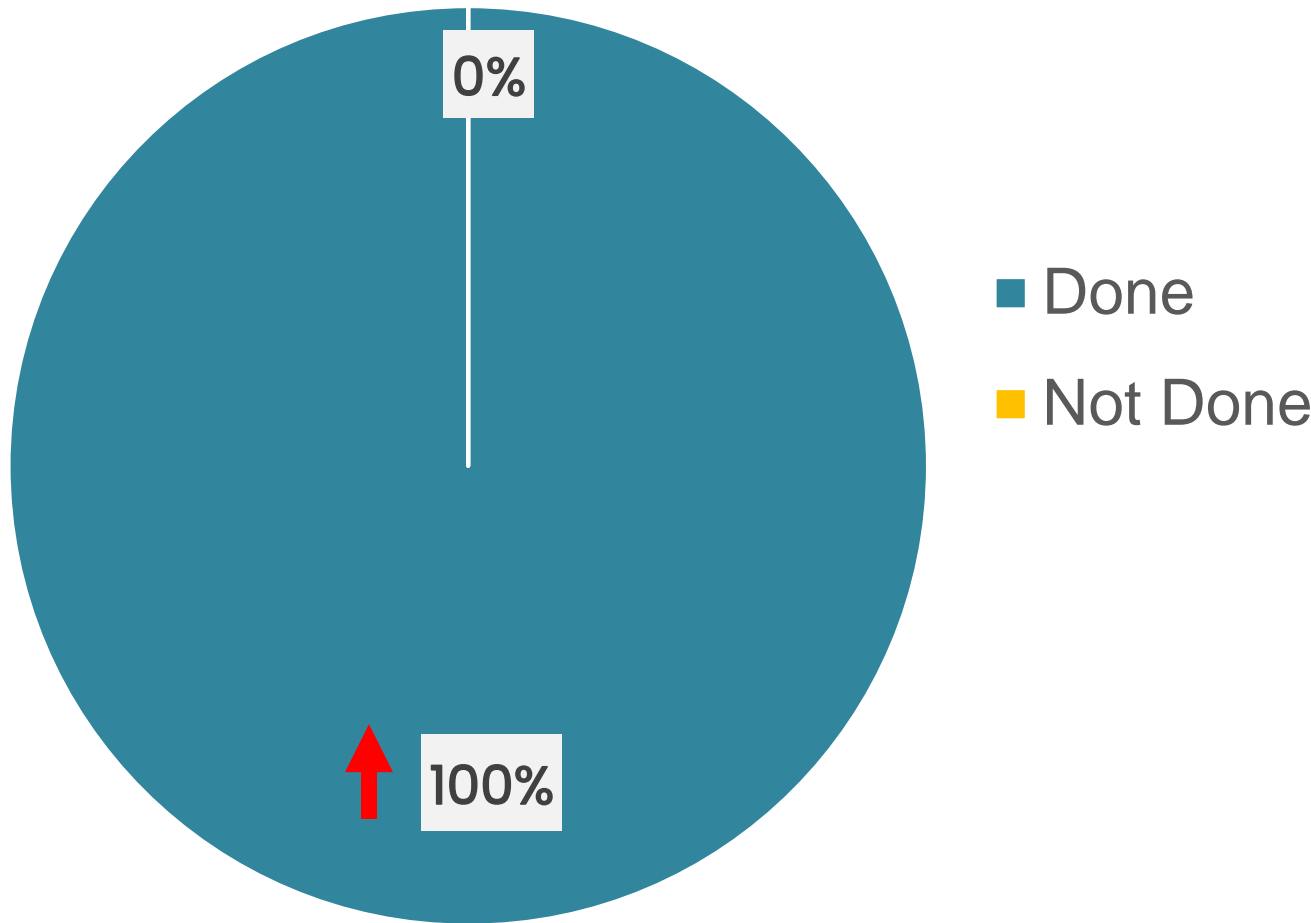
# Effects of Change: Pre-Op Skin Assessment Done During Pre-OP Round

## Percentage of Pre-Op Skin Assessment Done During Pre-OP Round

### PRE-REMEDIAL

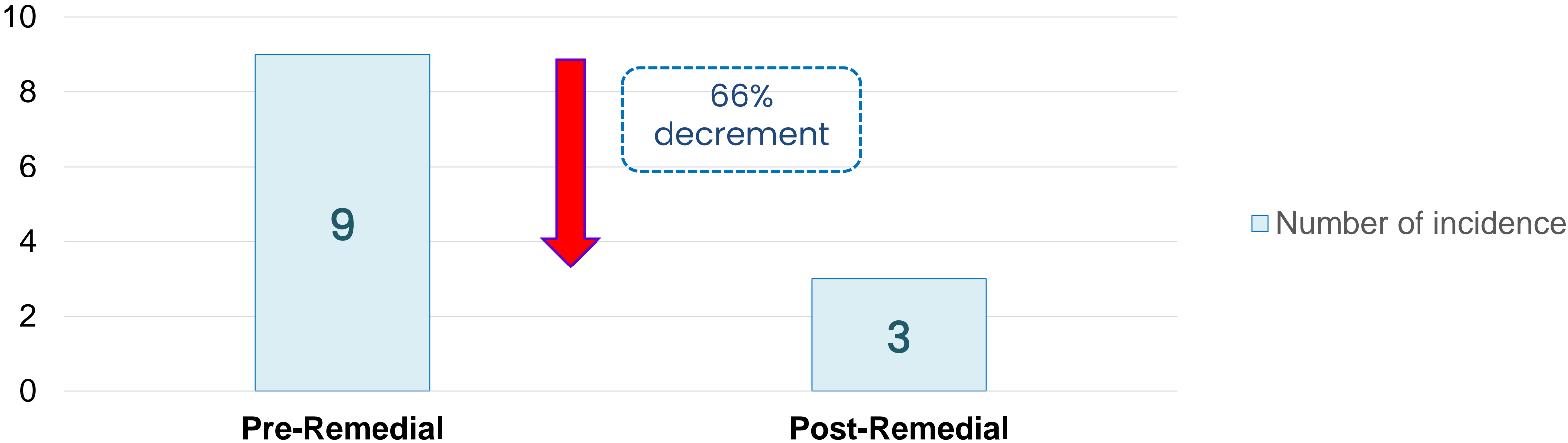


### POST-REMEDIAL



# Effects of Change: Incidence of High OT Temperature & Humidity within 6 months

## Number of incidence of High OT Temperature & Humidity





# Effects of Change: Model of Good Care

No.	Process	Criteria	Standard	Pre-Remedial	Post-Remedial
1	Prepare patient for operation	<ul style="list-style-type: none"> <li>All patients should be fit and optimized for surgery:               <ul style="list-style-type: none"> <li>- General condition</li> <li>- Blood results</li> </ul> </li> <li>All patients must have written consent for surgery</li> </ul>	100%	100%	100%
2	Pre-op round	<ul style="list-style-type: none"> <li>Pre-op skin assessment must be done 12 hours prior surgery               <ul style="list-style-type: none"> <li>- All patients on POP need to be bivalve</li> <li>- Skin must be free from severe bruise, swelling or skin infection</li> </ul> </li> </ul>	100%	69.2%	100%
3	Prescribe prophylaxis antibiotics	<ul style="list-style-type: none"> <li>All patients must be prescribed with prophylaxis antibiotics according to antibiotic guidelines</li> </ul>	100%	100%	100%



# Effects of Change: Model of Good Care

No.	Process	Criteria	Standard	Pre-Remedial	Post-Remedial
4	Ensure normal operation theatre (OT) temperature and humidity	<ul style="list-style-type: none"> <li>All operation theatre should fulfill the following conditions:               <ul style="list-style-type: none"> <li>Temperature range: 18 - 22 degree Celsius</li> <li>Humidity range: 55 - 60%</li> </ul> </li> </ul>	100%	97%	99.4%
5	Skin scrubbing	<ul style="list-style-type: none"> <li>All patients should have a standard skin scrubbing technique i.e. using chlorhexidine + povidone solution</li> </ul>	100%	0%	100%
6	Wound education to patient prior to discharge	<ul style="list-style-type: none"> <li>All patients will be given education flyers on wound care</li> </ul>	100%	0%	100%

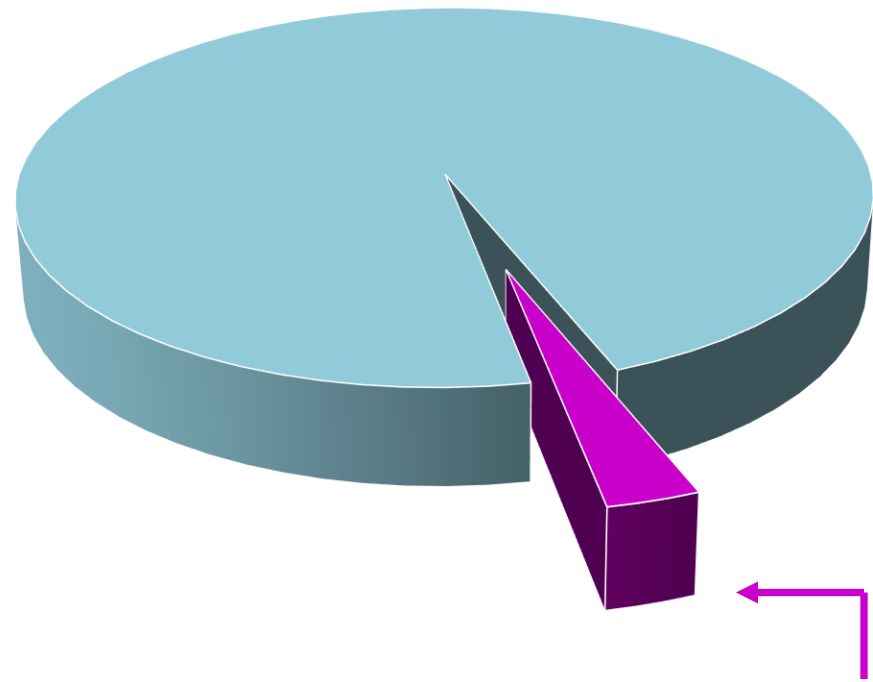


# Effects of Change:

Incidence of SSI within 6 months

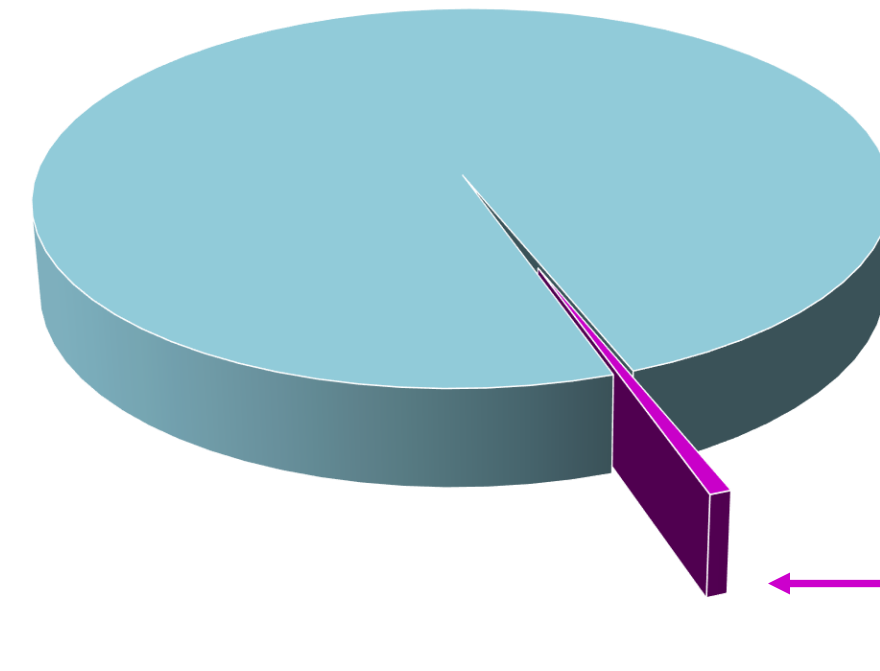
Percentage of SSI cases in Orthopaedic Department HNSZ

PRE-REMEDIAL



$$\frac{13}{434} \times 100 = 2.995\%$$

POST-REMEDIAL



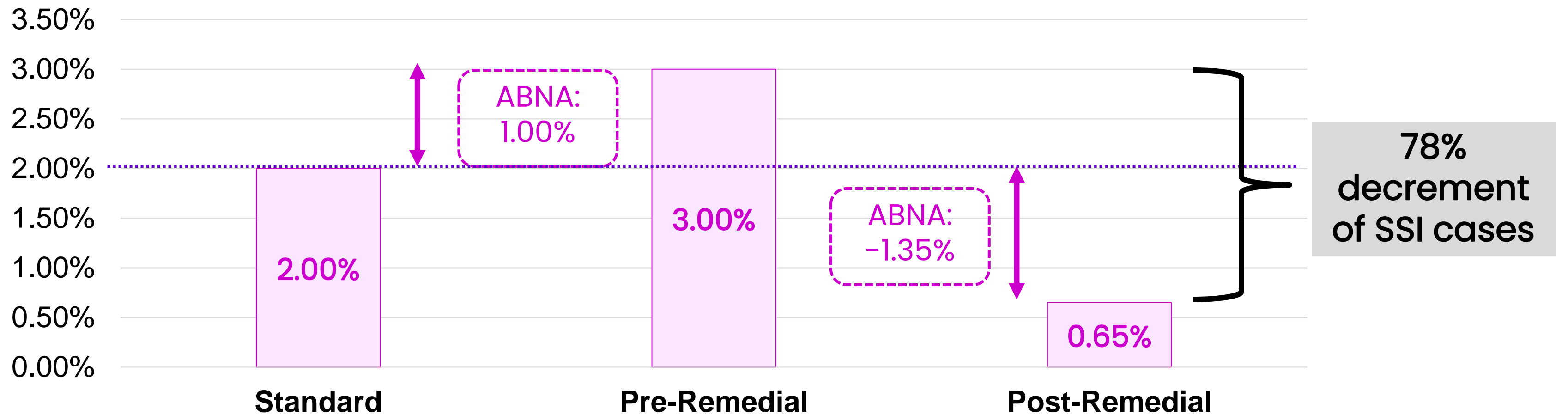
$$\frac{3}{461} \times 100 = 0.65\%$$



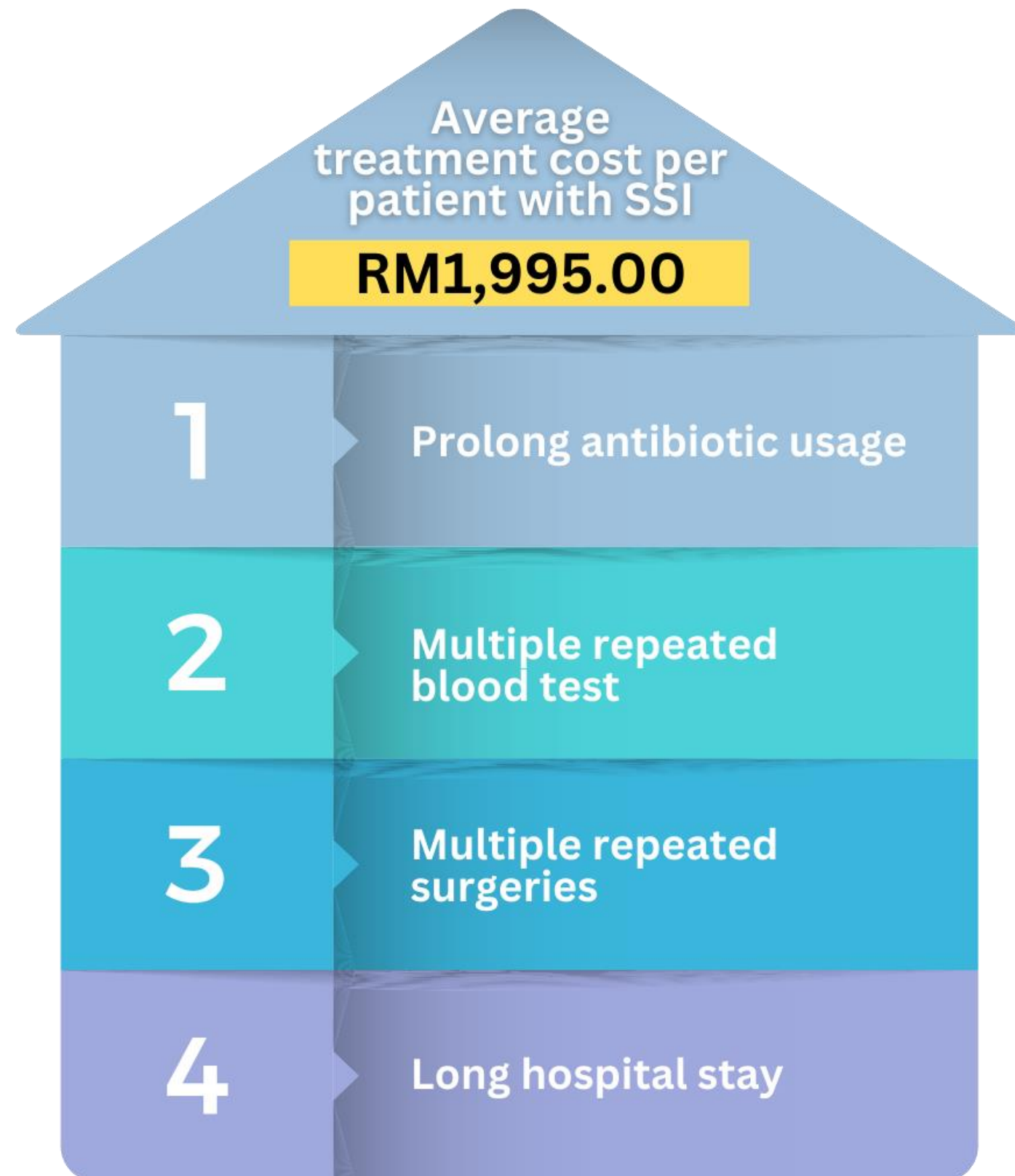


# Achievable Benefit Not Achieved (ABNA)

## Percentage of Surgical Site Infection in Orthopaedic Department, HSNZ



# Effects of Change: Estimated Expenditure Comparison



## PRE-REMEDIAL



**RM 25,935**

(RM 1,995 x 13 patients)

## POST-REMEDIAL



**RM 5,985**

(RM 1,995 x 3 patients)



**Cost Saving:**  
**RM 19,950**



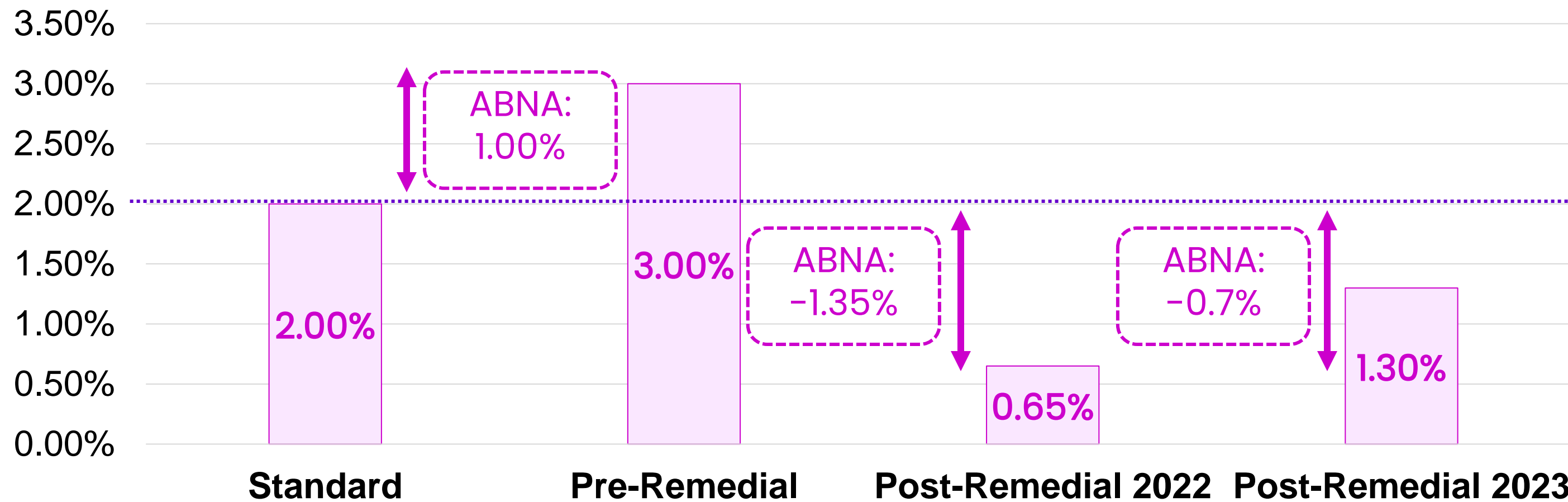
# Sustainability





# Achievable Benefit Not Achieved (ABNA)

## Percentage of Surgical Site Infection in Orthopaedic Department, HSNZ



# Satisfactory Survey

## Satisfactory survey form in using perioperative checklist (n=18)

1. Does the perioperative checklist **EASE** your daily work process?



94.4%



5.6%

2. Does the perioperative checklist is **READILY ACCESSIBLE** to all orthopedic staff?



88.8%



11.2%

3. Do you feel the perioperative checklist form is **USER FRIENDLY**?



94.4%



5.6%

4. Do you feel the perioperative checklist helps In **REDUCING RISK** of SSI?



83.3%



16.7%



YES



NO

# The Next Step





# The Next Steps

1

The designed perioperative checklist is being implemented to hospital cluster in Terengganu including Hospital Kemaman and Hospital Besut



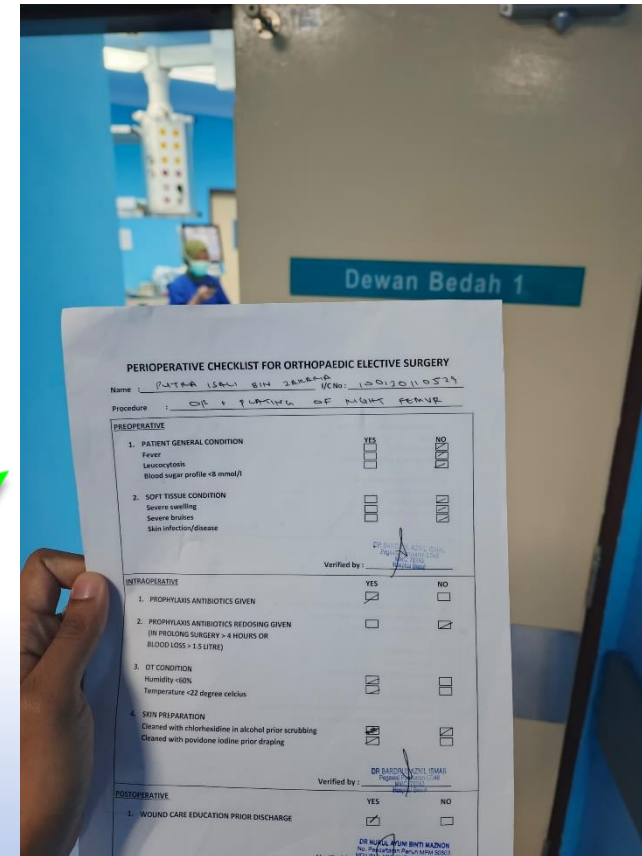
Hospital Kemaman



# The Next Steps

1

The designed perioperative checklist is being implemented to hospital cluster in Terengganu including Hospital Kemaman and Hospital Besut



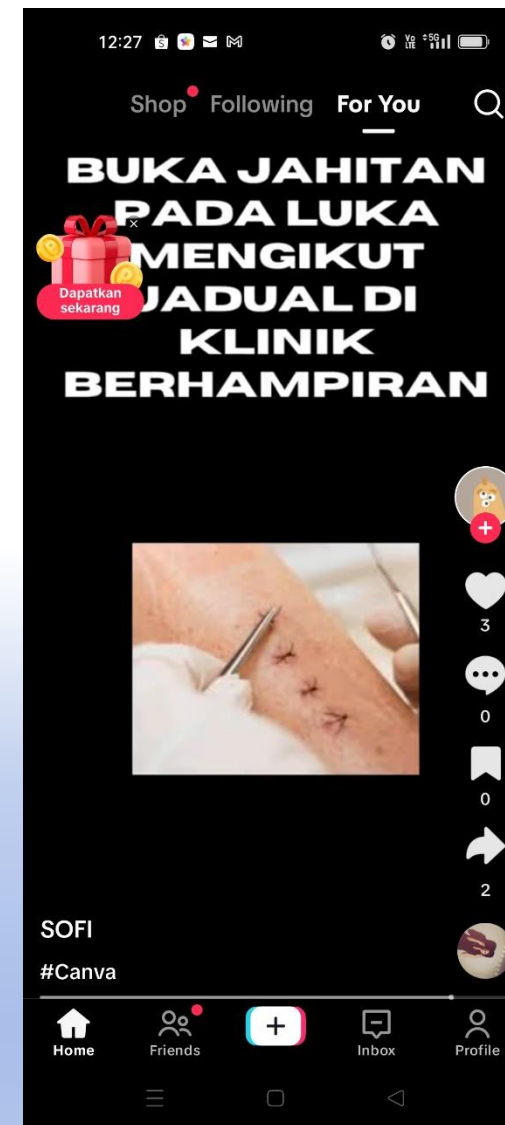
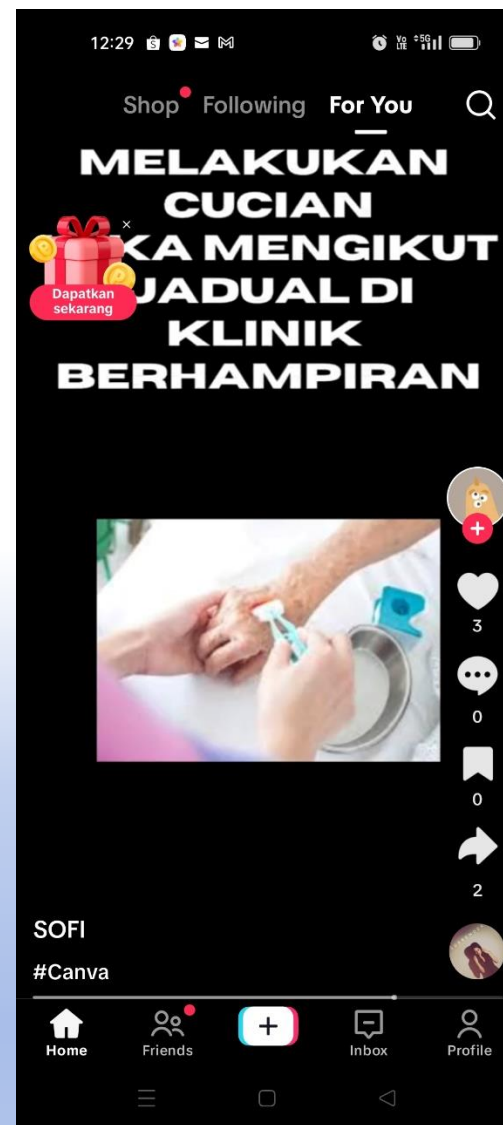
Hospital Besut

# The Next Steps

2

The education series has been enhanced to staff and patient via social media ; facebook, Tik Tok

Facebook



TIKTOK



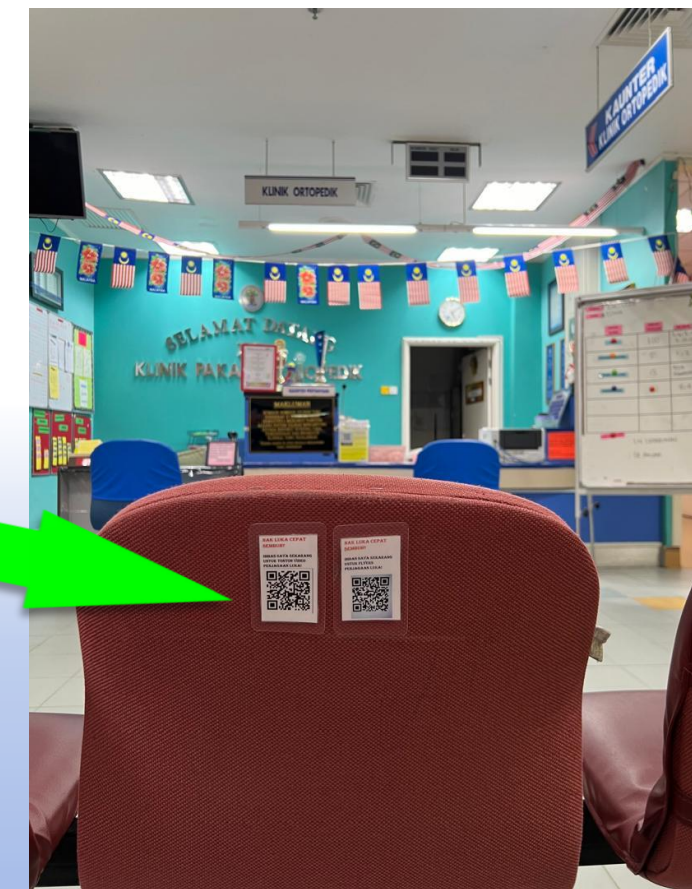
# The Next Steps

3

QR code for flyers and illustrative video has been created and placed to the bedside in ward and clinic to make it more accessible



Bedside ward



Clinic

# The Next Steps

4

Continuing to monitor the work process through regular audit

5

To share the remedial actions and experiences with other hospitals in the country and to expand the study to national level



HSNZ



HKM & HOSBES



ALL HOSPITALS IN COUNTRY

# Conclusion

1

**Pre-remedial data showed that almost 3% incidence** of surgical site infection in orthopedic elective surgery in HSNZ

2

**The contributing factors to this problem** includes unoptimized soft tissue condition and skin scrubbing technique prior surgery, lack of patient's knowledge and unoptimized OT temperature and humidity

3

**Strategies formulated** include perioperative checklist, upgraded temperature and humidity monitoring tool, educational series to staff and patient through CME, flyers, banner and interactive video

4



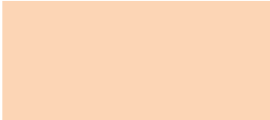











**Post-remedial, percentage of SSI incidence successfully reduced from 3% to 0.65% with cost saving up to RM 19,950**



# GANTT CHART

 Planned

 Actual

Time	Person in charge	Jun 2020	July 2020	August 2020	September 2020	October 2020 till March 2022	April 2022	May 2022
Committee establishment	Group Leader	 						
Brainstorming and problem selection	All members		 					
Verification study & problem analysis	All members			 	 			
Remedial action implementation	All members					 		
Re-evaluation study	All members						 	
Discussion/ presentation	All members							 

# References

1. Singh R, Singla P, Chaudhary U. [Surgical Site Infection: Classification, Risk factors, Pathogenesis and Preventive Management](#). *International Journal of Pharma Research and Health Sciences*. 2014; 2(3): 203-214.
2. Oh AL, Goh LM, Nik Azim NA, Tee CS, Shehab Phung CW. [Antibiotic usage in surgical prophylaxis: a prospective surveillance of surgical wards at a tertiary hospital in Malaysia](#). *J Infect Dev Ctries*. 2014; 8(2): 193-201. doi: 10.3855/jidc.3076
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6. Fan Y, Wei Z, Wang W, et al. [The incidence and distribution of surgical site infection in mainland China: a meta-analysis of 84 prospective observational studies](#). *Sci Rep*. 2014; 4: 6783. doi: 10.1038/srep06783

12<sup>th</sup> QA Convention

# Thank You

## For Your Attention

