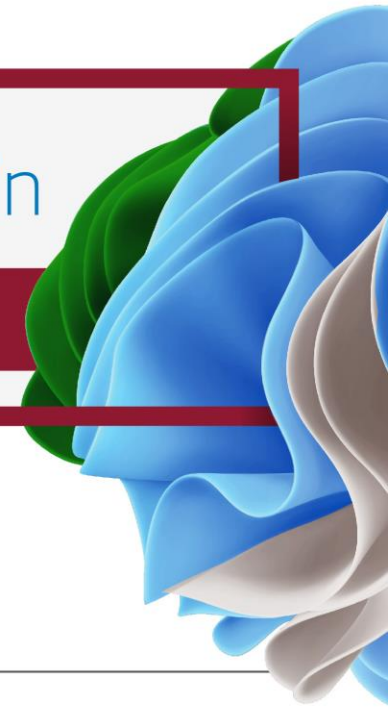
مؤسسة حمد الطبية
Hamad Medical Corporation
HEALTH • EDUCATION • RESEARCH صحة • تعليم • بحوث

In Collaboration with

Institute *for* Healthcare Improvement

Middle East Forum on Quality & Safety in Healthcare **2023**

16-19 March, Doha



Healthcare Resilience in Extraordinary Times

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Conflict of Interest

The speaker(s) or presenter(s) in this session has/have no conflict of interest or disclosure in relation to this presentation.

Learning Objectives

At the end of this session, participants will be able to:

1. Identify the role of antibiotic prophylaxis in surgical site infection prevention
2. Share experiences for quality improvement in surgical antibiotic prophylaxis
3. Understand the impact of multidimensional programs in the quality, safety, and efficiency of healthcare

Title

Improving compliance with antibiotic prophylaxis in selected surgical procedures.

Surgical site infections

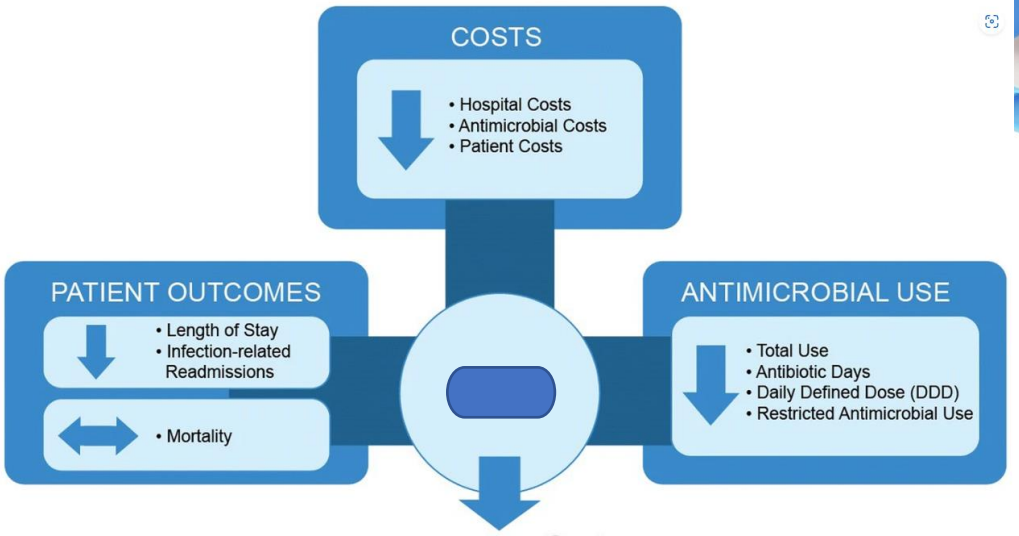
Surgical site infection (SSI) is one of the most frequently reported types of hospital-acquired infection (HAI)

20% of HAI

40% of HAI in surgical patients

Surgical site infections

SSI are a leading cause of perioperative morbidity and mortality and contribute substantially to the health care costs.



https://aricjournal.biomedcentral.com/articles/10.1186/s13756-019-0471-0/figures/3

Antibiotic prophylaxis in surgery

- Fundamental preventive practice for surgical site infections
- The prophylactic agent should target the most likely offending organisms specific to the operative site.
- Antibiotic prophylaxis should be administered within 60 minutes of the incision.
- The benefit from antibiotic prophylaxis is most likely lost once the incision is closed.
- There is no evidence to support continuing antibiotics until drains or tubes are removed.
- Indicated in clean contaminated surgical procedures and selected clean procedures

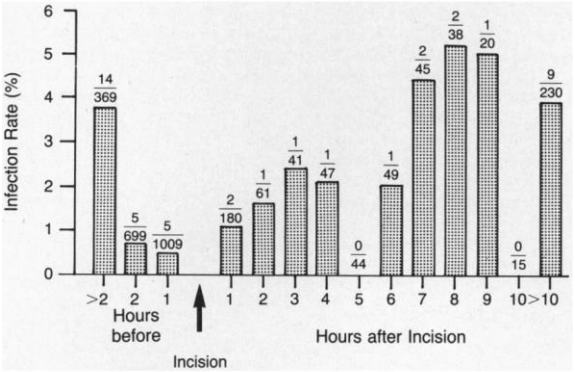
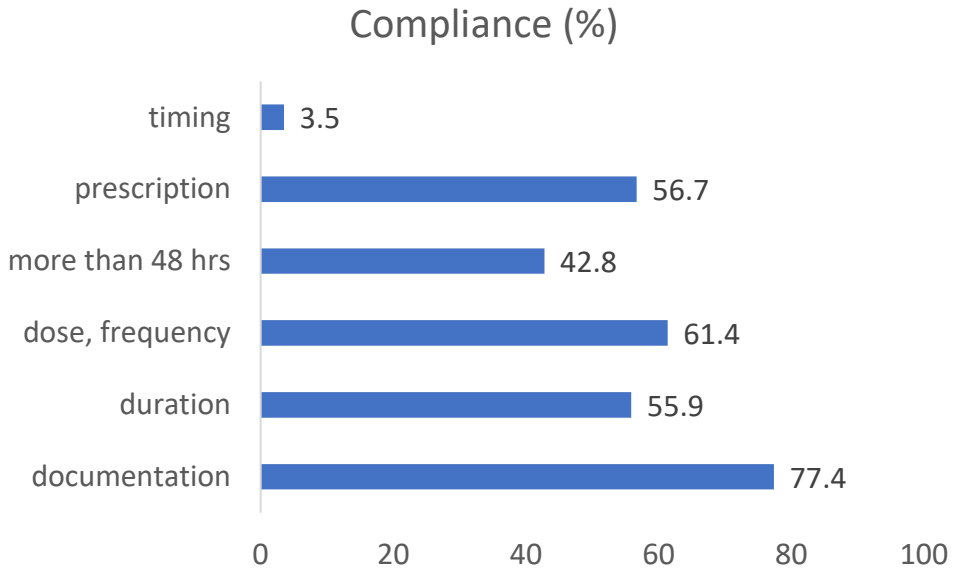
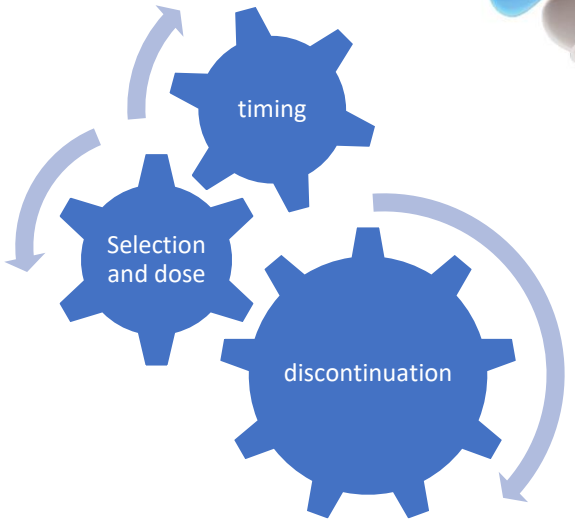


Figure 1. Rates of Surgical-Wound Infection Corresponding to the Temporal Relation between Antibiotic Administration and the Start of Surgery.

The Timing of Prophylactic Administration of Antibiotics and the Risk of Surgical-Wound Infection (nejm.org)

Compliance with antibiotic prophylaxis in surgery





SBN: 978-1-925948-78-3

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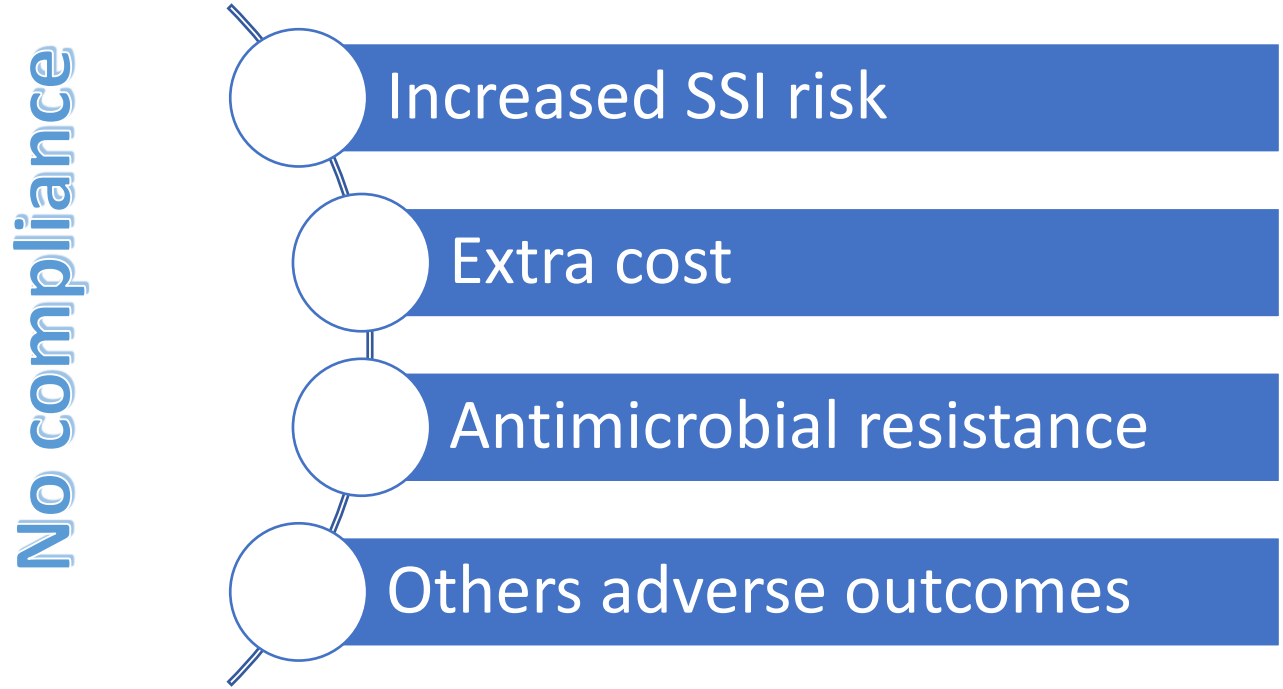
Compliance with antibiotic prophylaxis in surgery



Setting

- 75 beds hospital located in Western Qatar
- Member of Hamad Medical Corporation
- During COVID-19 pandemic was dedicated to provide exclusive care to COVID-19 patients
  - expanded to 385 beds including tent
  - surgical activity limited to Cesarean Section in COVID-19 patients and few other emergencies
  - Supported with staff hired during the pandemic

Resuming the surgical activity

- Resume the surgical activity according to the hospital's scope
- The finding of non-compliance with antibiotic prophylaxis with few differences among procedures

Key problems identified at baseline			
Procedures	Timing	Selection/Dose	Discontinuation
Cesarean section	ɣ		
Appendectomy		ɣ	ɣ
Hernia surgery			ɣ
Abdominoplasty			ɣ
ORIF	ɣ		
Cholecystectomy		ɣ	ɣ

86%

Problem statement

Antibiotic prophylaxis as a fundamental practice for SSI prevention

Surgical procedures limited to emergency procedures in COVID-19 positive cases.

When resuming the surgical activity was observed non-compliance with antibiotic prophylaxis in selected surgical procedures.

Rationale

Surgical site infection (SSI) constituted a critical patient and safety issue that could be prevented in up to 84% of cases by the implementation of a multifaced prevention program.

The antibiotic prophylaxis constituted a fundamental practice for SSI prevention, including the timing of antibiotic administration, the selection of antibiotic and doses required and the timely discontinuation, based in evidence-based guidelines.

The Policy CL 7197(Hamad Medical Corporation) guide the rational use of antibiotic in a wide range of surgical procedures.

Aim

Increase the compliance for antibiotic prophylaxis from 86% at baseline to 95% by December 2022

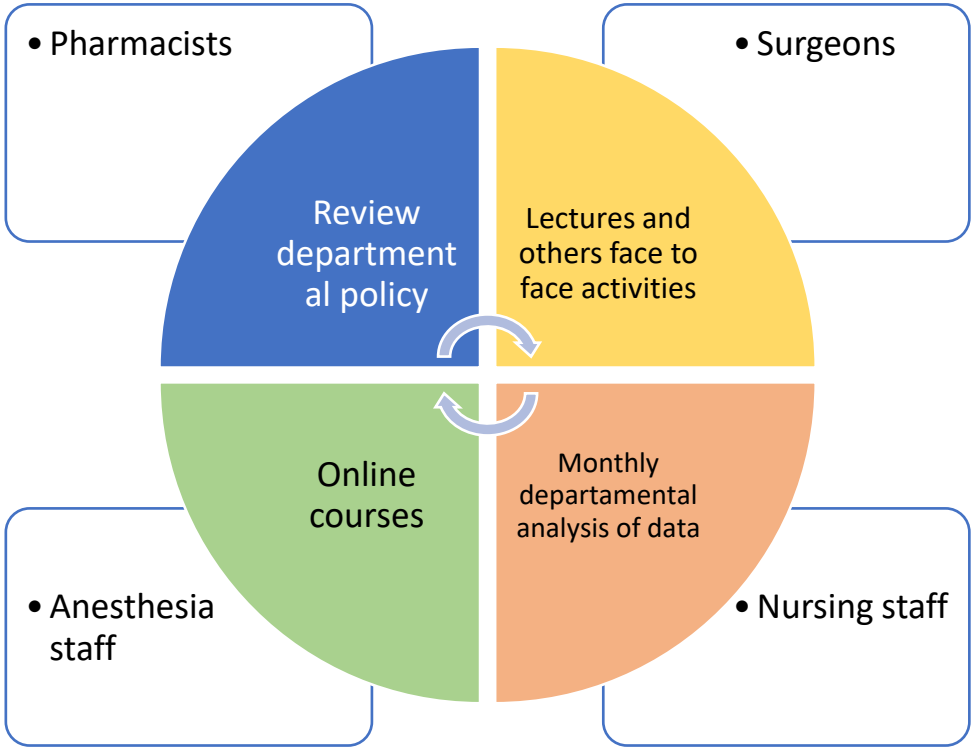
Intervention

1. Education
2. Pharmacy intervention
3. Monitoring
4. Feedback
5. Anesthesia staff responsibilities
6. Department Champions

Baseline
- Jan-Apr 2022

Intervention
- May Dec 2022

Education/Trainings



Pharmacy intervention

- Ongoing review
- Feeback to prescriber
- Coordination among clinical pharmacist and anesthesia staff

Monitoring compliance

- Monthly monitoring of compliance
- Consumption data collected
- Data collection embedded to the surveillance of HAI

Feedback

- Monthly feedback of compliance
- To surgical department and leaders
- To QPS: PCI, Farmacotherapeutic.

Anesthesia staff

- Responsible of administer prophylaxis

Champions

- Monitoring compliance
- Analysis

- QI Project measures: Outcome
  - Compliance with antibiotic prophylaxis
    - Timing
    - Selection and dose
    - Discontinuation

$$\text{compliance} = \frac{No.\ cases\ with\ compliance\ according\ to\ policy}{number\ of\ surgical\ procedures} \text{x 100 procedures}$$

- QI Project measures: Balance
  - Consumption of antibiotics
    - Included all the doses administered
    - Measure as Daily Define Doses (DDD) per 100 procedures
    - WHO methodology: [WHOCC - ATC/DDD Index]

$$\text{consumption} = \frac{number\ of\ DDD}{number\ of\ surgical\ procedures} \text{x 100 procedures}$$

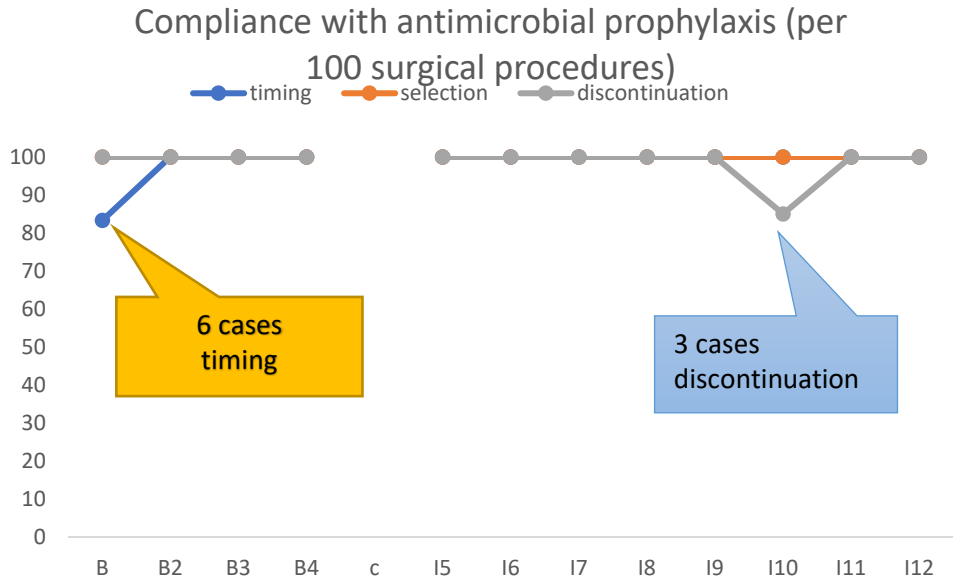
- QI Project indicators: Balance
  - Cost of antibiotic
    - According to HMC prices
    - In Qatari Riyal per 100 procedures

$$= \frac{cost\ of\ antibiotics\ (QR)}{number\ of\ procedures} \text{x 100 procedures}$$

Results

Procedure-Period		
procedure	baseline	intervention
CS	49	188
App	71	197
Hernia	6	69
ORIF	30	128
Abdom	8	40
Cholec	21	49
Total	185	671

Cesarean Section



Timing-

- from 87.8% during baseline (6 cases, Jan 2022) to 100% in intervention period

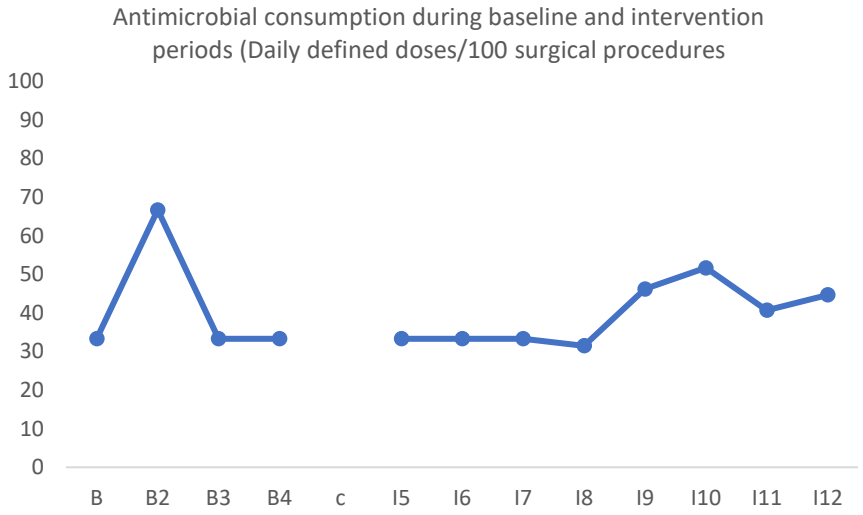
Selection-

- no change (100% compliance in both periods)

Discontinuation-

- 100% compliance during baseline and 97.8% during the intervention (3 cases, Oct 2022)

Cesarean Section



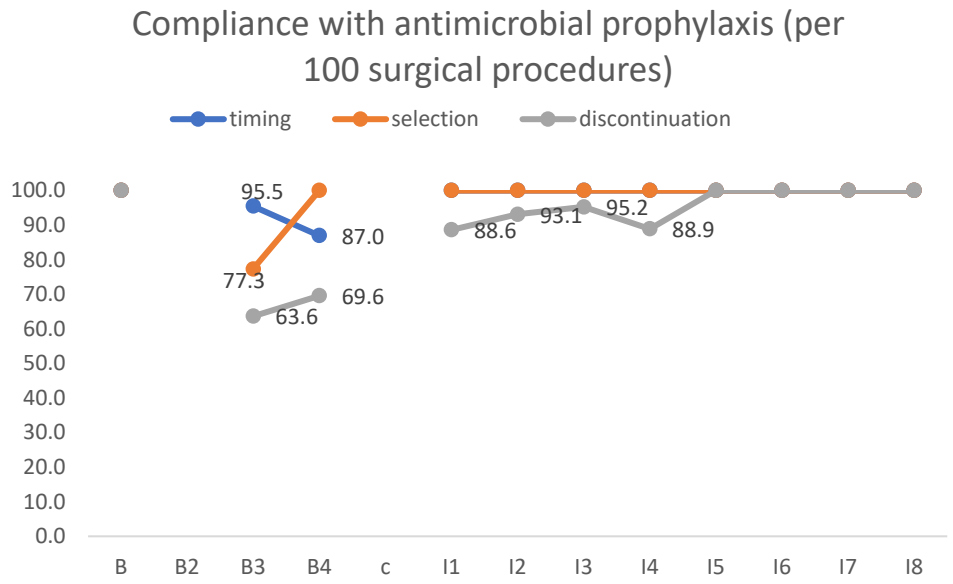
Baseline: 34.0 DDD/100 procedures
Intervention: 37.4 DDD/100 procedures

Consumption- increased 17% in relation to non-compliance with discontinuation and additional doses in obese patients

Baseline: 302.8 QR/100 procedures
Intervention: 365.5 QR/100 procedures

Cost – increased 18.6% during the intervention

Appendectomy



Timing
-from 90.1% at baseline to 100% during intervention

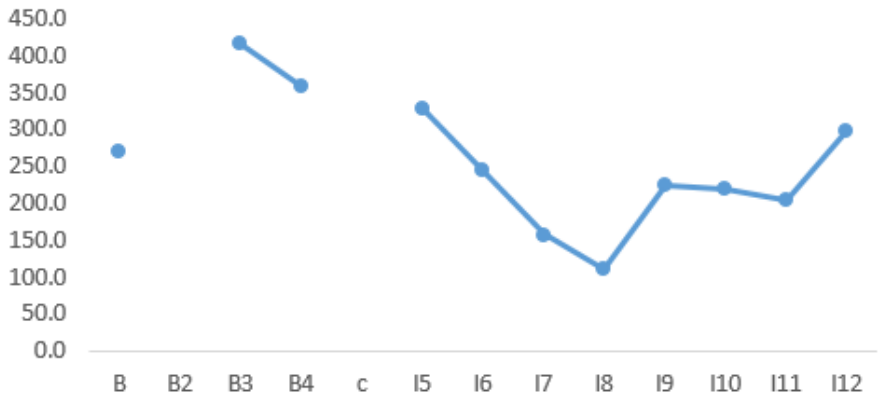
Selection
- from 93.0% at baseline to 100% during intervention

Discontinuation
- 69.0% at baseline to 95.4% during intervention

The improper discontinuation of antibiotic prophylaxis in non-complicated cases constituted the key factor for additional intervention

Appendectomy

Antimicrobial consumption during baseline and intervention periods
(Daily defined doses/100 surgical procedures



Baseline: 750.9 DDD/100 procedures
Intervention: 527.8 DDD/100 procedures

Consumption- reduce by 29.7% in relation to improved compliance with discontinuation

Baseline: 6803.7 QR/100 procedures
Intervention: 4918.3 QR/100 procedures

Cost – reduced by 27% in relation to improved compliance with discontinuation

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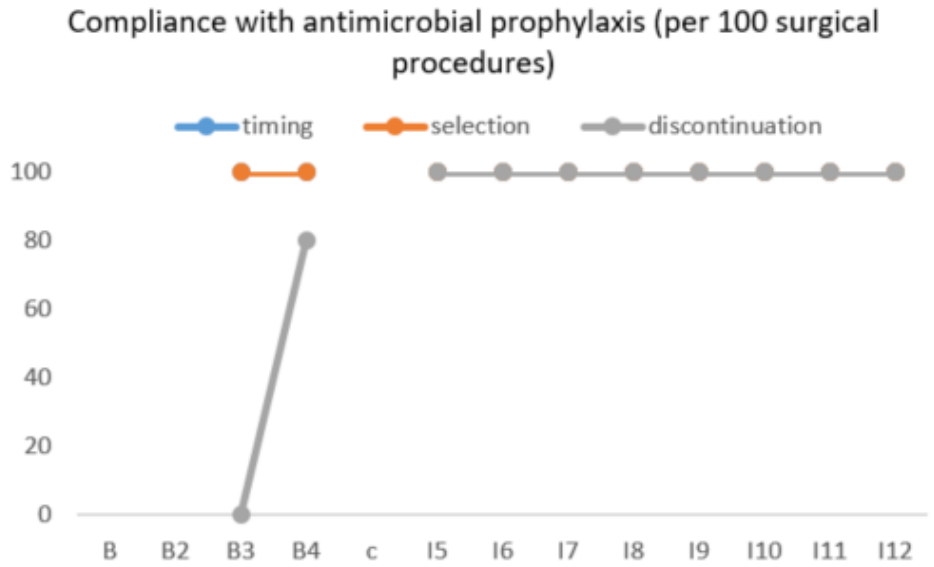
Hernia surgery



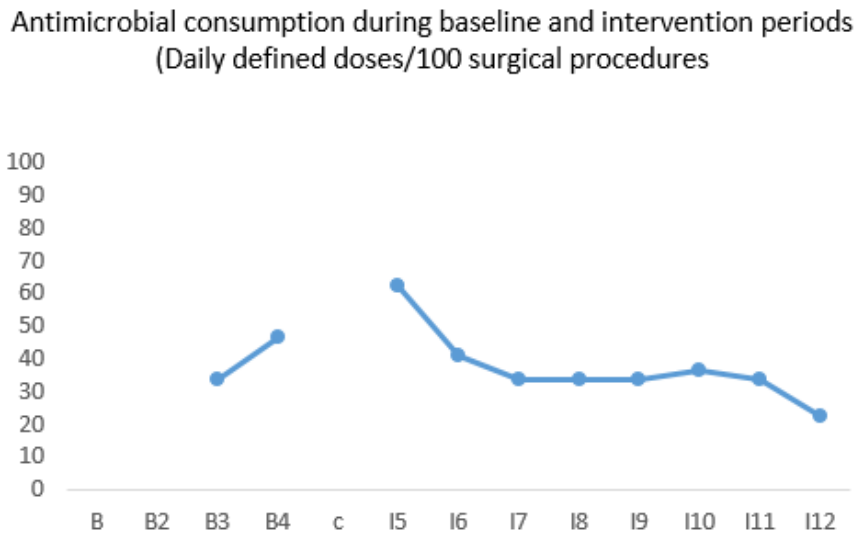
Timing-100% compliance during both periods

Selection- 100% compliance during both periods

Discontinuation- from 66.7% at baseline to 100% during intervention

The improper discontinuation of antibiotic prophylaxis was observed in two cases

Hernia Surgery



Baseline: 38.9 DDD/100 procedures
Intervention: 36.7 DDD/100 procedures

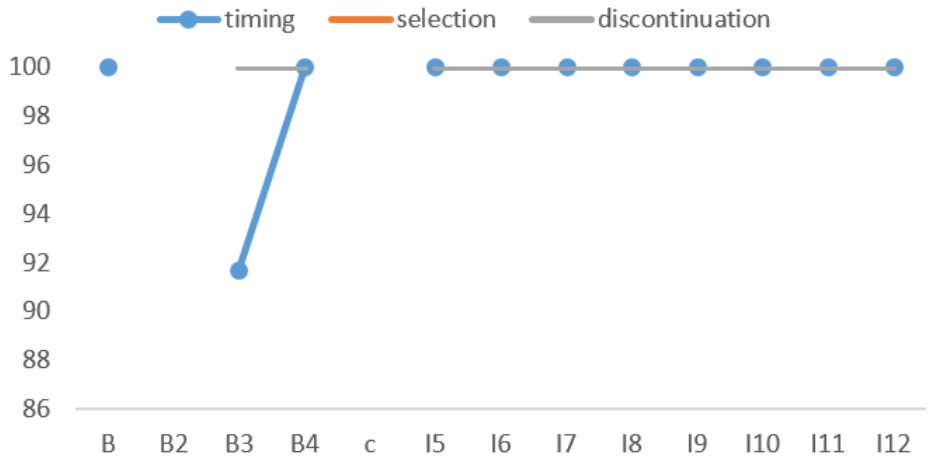
Consumption- reduce by 5.6% in relation to improved compliance with discontinuation

Baseline: 402.7 QR/100 procedures
Intervention: 332.6 QR/100 procedures

Cost – reduced by 27.7% in relation to improved compliance with discontinuation

Open reduction and internal fixation (ORIF)

Compliance with antimicrobial prophylaxis (per 100 surgical procedures)



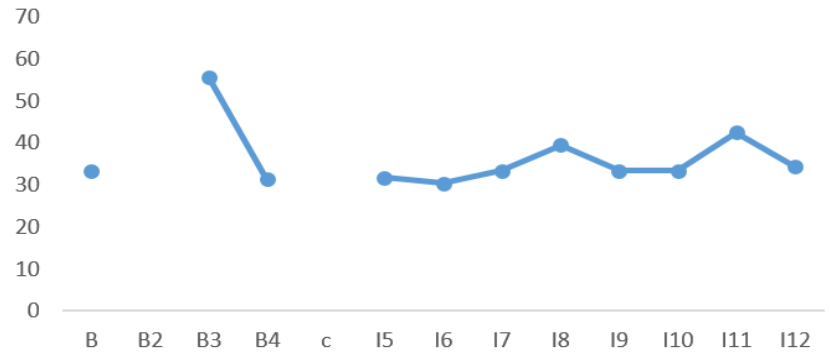
Timing-
- from 96% (1 case) at baseline to 100% during intervention

Selection
- 100% compliance during both periods

Discontinuation
- 100% compliance during both periods

ORIF

Antimicrobial consumption during baseline and intervention periods
(Daily defined doses/100 surgical procedures



Baseline: 41.1 DDD/100 procedures
Intervention: 34.6 DDD/100 procedures

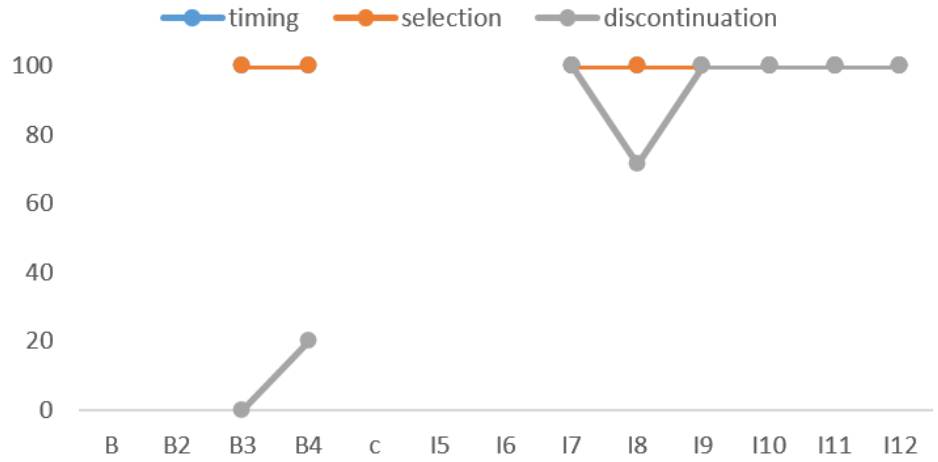
Consumption- reduced by 15.8%
Variation in consumption and cost related to additional doses in longer procedures

Baseline: 372.5 QR/100 procedures
Intervention: 83.6 QR/100 procedures

Cost – reduced by 77.6%
Variation in consumption and cost related to additional doses in longer procedures

Abdominoplasty

Compliance with antimicrobial prophylaxis (per 100 surgical procedures)



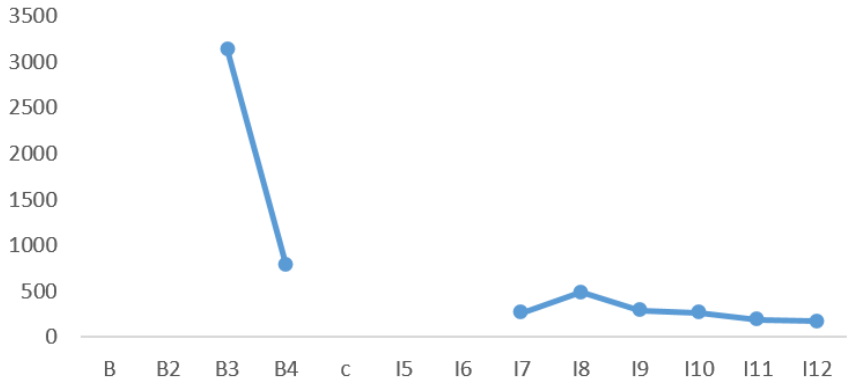
Timing
-100% compliance during both periods

Selection
-100% compliance during both periods

Discontinuation
- from 12.5% (1 case) at baseline to 95% during intervention

Abdominoplasty

Antimicrobial consumption during baseline and intervention periods (Daily defined doses/100 surgical procedures



Baseline: 1670.8 DDD/100 procedures
Intervention: 275.4 DDD/100 procedures

Consumption- reduced by 83.5% related to appropriate discontinuation

Baseline: 6372.5 QR/100 procedures
Intervention: 369.5 QR/100 procedures

Cost – reduced by 93.8% related to appropriate discontinuation

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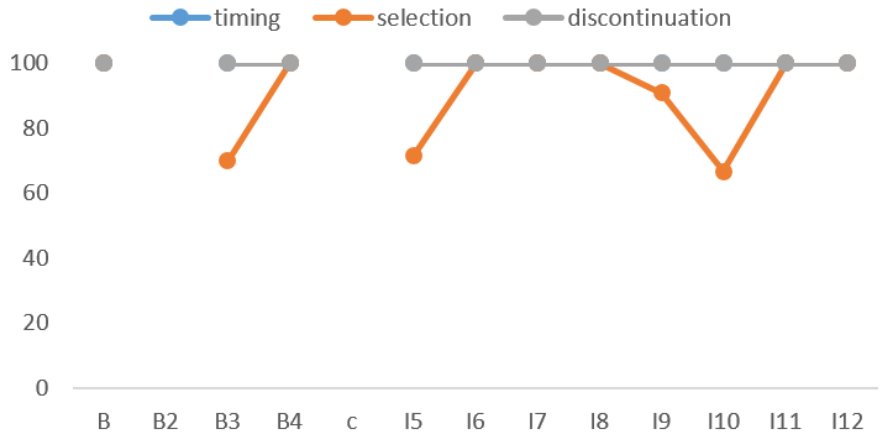
Cholecystectomy

Compliance with antimicrobial prophylaxis (per 100 surgical procedures)



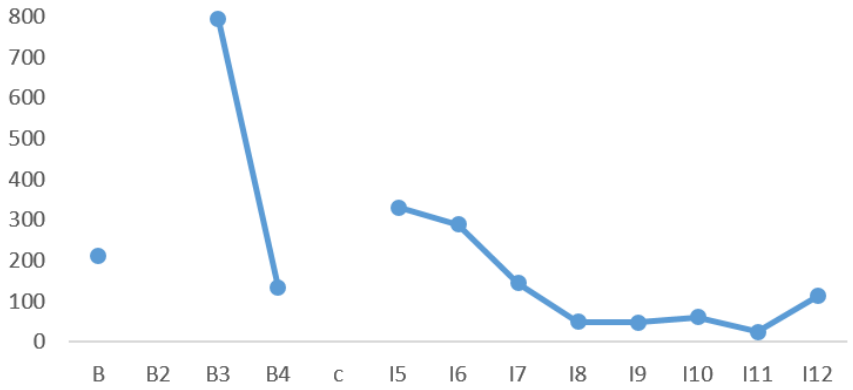
Timing
-100% compliance during both periods

Selection
- from 85.7 at baseline to 89.8% during intervention.

Discontinuation
- 100% compliance during both periods

Cholecistectomy

Antimicrobial consumption during baseline and intervention periods
(Daily defined doses/100 surgical procedures



Baseline: 455.6 DDD/100 procedures
Intervention: 146.6 DDD/100 procedures

Consumption- reduced by 55.6% related to accurate evaluation of cases and limited prophylaxis according policy

Baseline: 7201.2 QR/100 procedures
Intervention: 5726.1 QR/100 procedures

Cost – reduced by 20.5% related to accurate evaluation of cases and limited prophylaxis according policy

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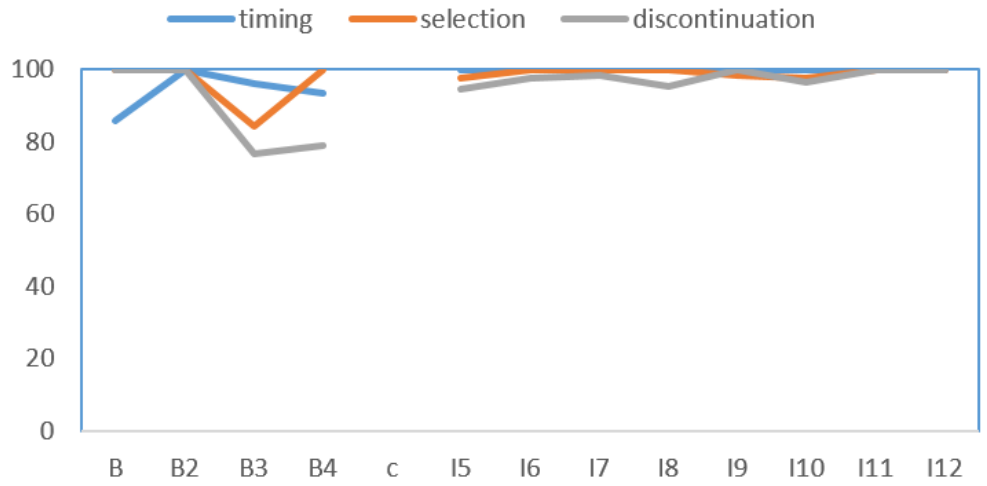
Total

Compliance with antimicrobial prophylaxis (per 100 surgical procedures)



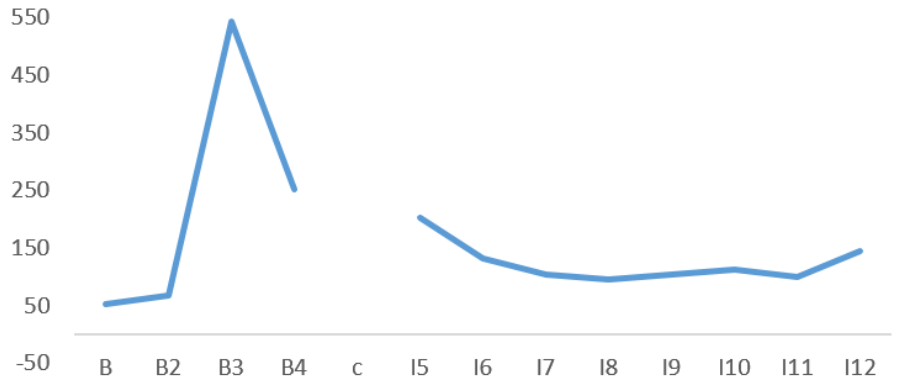
Timing
- from 92.4% at baseline to 100% during intervention

Selection
- from 95.7% at baseline to 99.2% during intervention.

Discontinuation
- from 83.2% at baseline to 97.7% during intervention

Total

Antimicrobial consumption during baseline and intervention periods (Daily defined doses/100 surgical procedures



Baseline: 284.9 DDD/100 procedures
Intervention: 127 DDD/100 procedures

Consumption- reduced by 55.4%

Baseline: 4502.2 QR/100 procedures
Intervention: 2695.1 QR/100 procedures

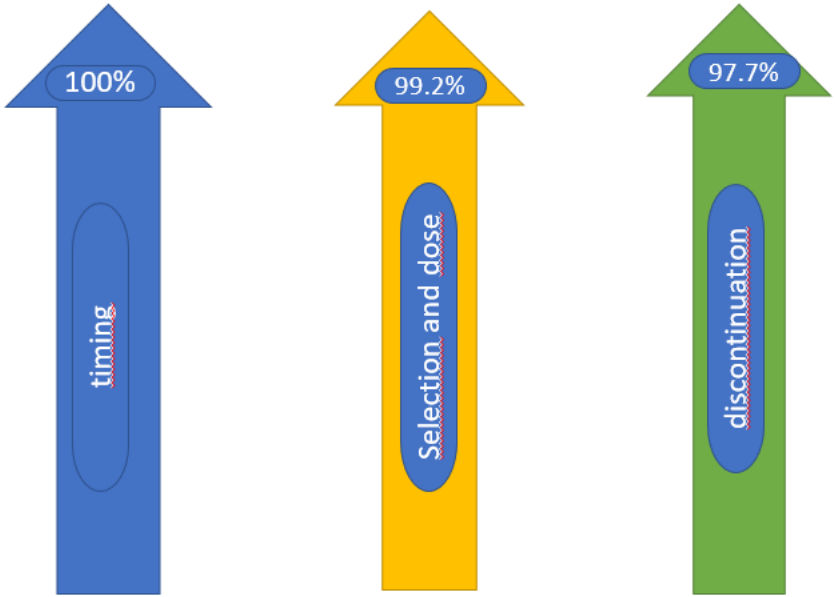
Cost – reduced by 40.1%

Selected antibiotics

Antimicrobial consumption/cost	Baseline	Intervention	change
Cefazolin			
DDD/100 procedures	34.4	31.4	-8.7
QR/100 procedures	311.8	284.5	-8.7
Cefuroxime			
DDD/100 procedures	62.5	38.1	-38.9
QR/100 procedures	4027.92	1608.88	-60.1
Metronidazol			
DDD/100 procedures	93.51	44.53	-52.4
QR/100 procedures	1317.80	412.83	-68.7

Outcome indicators

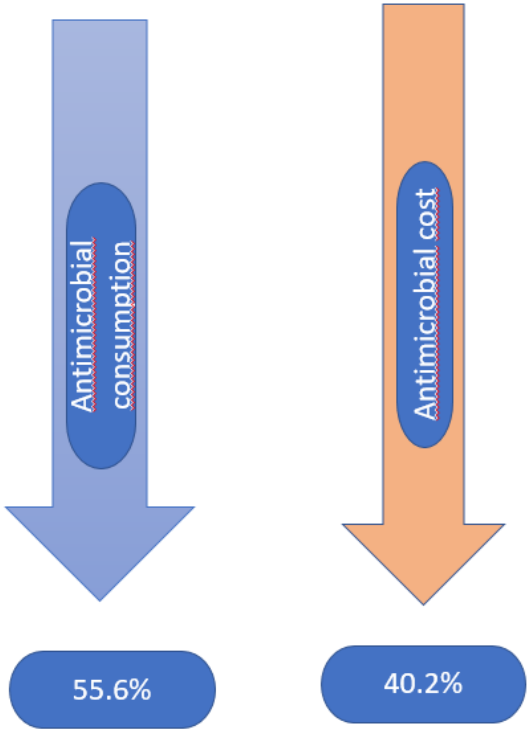
Goal achieved



Impact

- Prevention SSI
- Reduced exposure to antibiotic-adverse effects
- Prevention of MDR

Balance measures



Impact
- Efficiency of healthcare

What next?

- Various actions focused in in achieving sustainability
- Integration of monitoring and feedback to the surveillance of HAI
- Draft guidance to do
- Evaluate others procedures or indications of antibiotics

Thank you