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Patient Safety Research Introductory Course
Session 7

Translating Evidence to Safer Care

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Overview

- To provide understand and provide strategies on how research findings can be translated into practice.

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Components

1. In the IHI model for Improvement, what does PDSA stand for?

a. Process, Delivery, Study, Activation

b. Plan, Do, Study, Act

c. Position, Deploy, Steady, Aim

d. Patient, Doctor, Student, Administrator

2. In forming a quality improvement team, which of the following members does NOT necessarily need to be represented

a. Leaders of the health care organization

b. Physicians

c. Technical expertise with the clinical problem

d. Day-to-day leadership of units

3. After summarizing the evidence for effective interventions, what steps are need to translate evidence to safer care?

a. Identify local barriers to implementing the intervention
b. Measure performance
c. Ensure all patients get the intervention
d. All of the above

4. What is true about identifying local barriers to implementing interventions?

a. Intervention is part of a work process
b. It can be helpful to "walk-through" the steps to implement the intervention
c. Compliance can be improved by targeting failure points in implementation
d. All of the above

5. The 4 "Es" of implementing an intervention include

a. Educate, Estimate, Eradicate, Evaluate
b. Estimate, Educate, Execute, Eradicate
c. Engage, Educate, Execute, Evaluate
d. None of the above

Introduction

- Despite good evidence, difficult to get into practice changes that improve safety
- Knowledge translation needs to occur within systems of care

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Integrated Approach to Translating Evidence to Practice

- A focus on systems (how we organise work) rather than care of individual patients
- Engagement of local interdisciplinary teams to assume ownership of the improvement project
- Creation of centralised support for the technical work
- Encouraging local adaptation of the intervention
- Creating a collaborative culture within the local unit and larger system.

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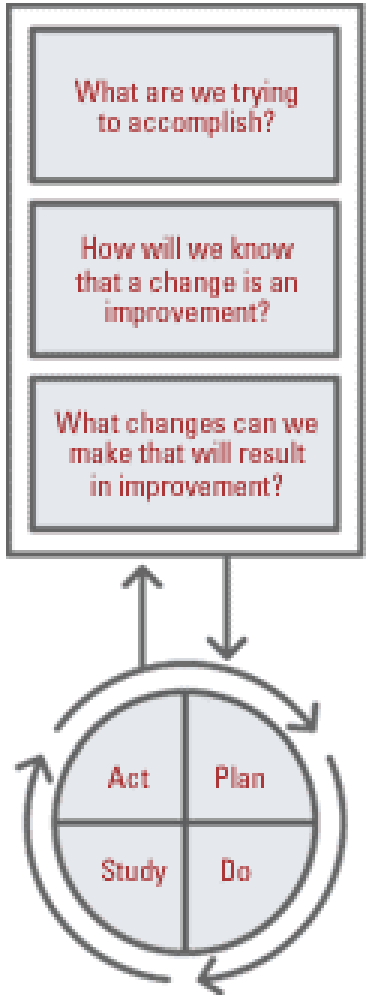
Institute for Healthcare Improvement (IHI) Model for Improvement



Forming the Team

- Effective teams include members representing three different kinds of expertise within the organization
  - system leadership
  - technical expertise
  - day-to-day leadership

  - There may be one or more individuals on the team with each kind of expertise, or one individual may have expertise in more than one area, but all three areas should be represented in order to drive improvement successfully

Team

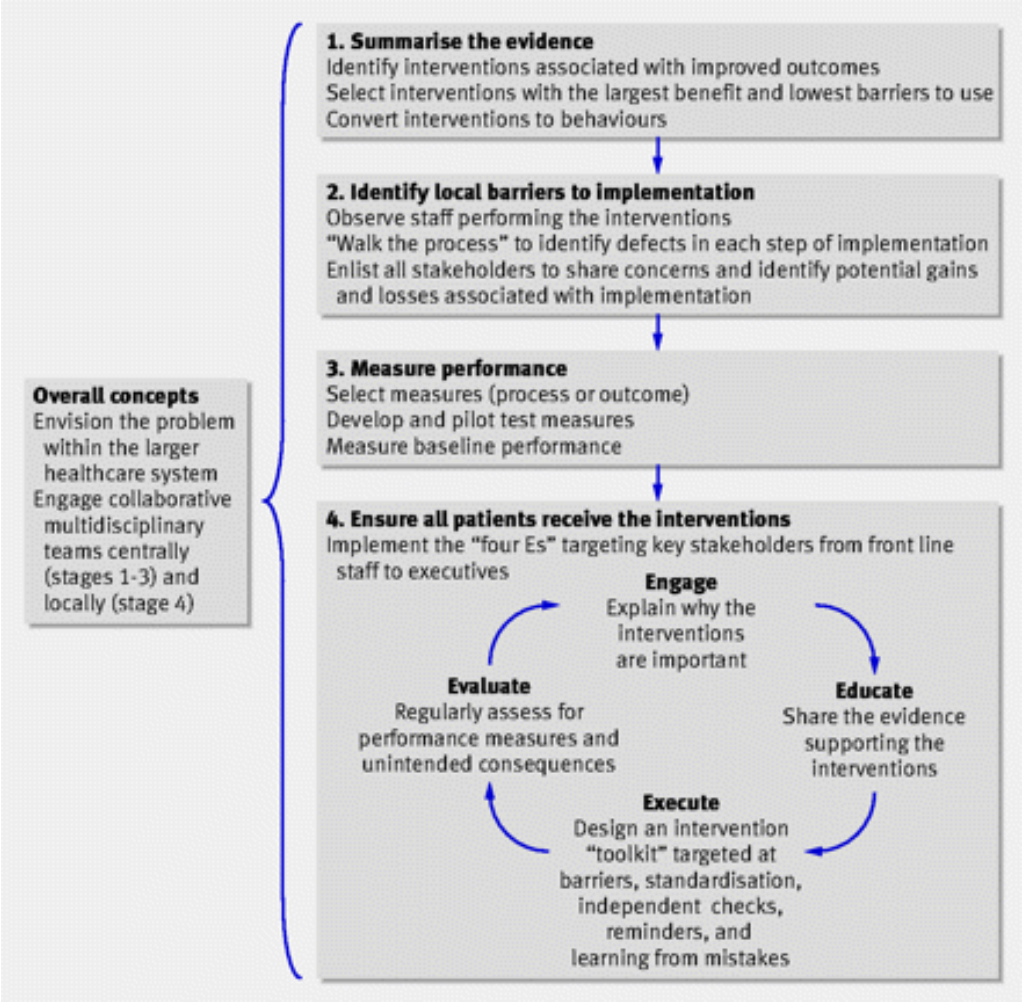
- Aim: Reduce adverse drug events (ADEs) on all medical and surgical units by 75 percent within 11 months.

Team:
Team Leader: ___, MD, Chair, Pharmacy and Therapeutics Committee, Patient Safety Officer
Technical Expertise: ____, RPh, Director, Clinical Pharmacist
Day-to-Day Leadership: ____, RN, Manager, Medical/Surgical Nursing
Additional Team Members: Risk Manager, Quality Improvement Specialist, Staff Nurse, Staff Education, and Information Technology

Setting Aims

- Reduce adverse drug events (ADEs) in critical care by 75 percent within 1 year.
- Improve medication reconciliation at transition points by 75 percent within 1 year.
- Achieve > 95 percent compliance with on-time prophylactic antibiotic administration within 1 year.

Strategy for Translating Evidence to Practice



Pronovost, BMJ 2008

Summarize the Evidence

- For interventions to improve a specific outcome
- Interdisciplinary team of researchers and clinicians reviews literature using to identify interventions with
  - greatest benefit
  - lowest barriers to use
- Agree on the top interventions (maximum of seven) and convert them into behaviors

Identify Local Barriers to Implementation

- The intervention will be part of a work process
- What is the context surrounding this work?
- Walk through steps with clinician to observe what is required to implement intervention
  - Where are the failure points?
  - What could be done to improve compliance?

Understanding Context

- To help understand the context in which the intervention will be implemented, ask all stakeholders why it is difficult or easy for them to comply with recommended practices
- Listen carefully and learn what staff may gain or lose from implementing the intervention

Measure Performance

- Need performance measures to evaluate
  - How often patients actually receive the recommended therapy (process measures)
  - Whether patient outcomes improve (outcome measures)
  - Outcome measures are preferred if valid and feasible

Measures

- Teams use quantitative measures to determine if a specific change actually leads to an improvement.
- Many sequential, observable tests
- Gather "just enough" data to learn and complete another cycle
- "Small tests of significant changes" accelerates the rate of improvement

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Ensure All Patients Receive the Intervention

- Final and most complex stage is to ensure that all patients reliably receive the intervention
- Interventions must fit each hospital's current system, including local culture and resources
- 4 "Es"
  - Engage
  - Educate
  - Execute
  - Evaluate

Engage

- Share real life stories of patients
- Estimate the harm attributable to omitting the intervention in their unit or hospital given their baseline data
- Informed each unit of its annual number of infections and patient deaths attributed to the infections

Educate

- All levels of staff
- Original scientific literature supporting the proposed interventions
- Concise summaries
- Checklist of the evidence

Execute

- Designed an implementation "toolkit" based on identified barriers to implementation
- Based on 3 principles for redesigning care
  - standardize care processes
  - create independent checks (such as checklists)
  - learn from mistakes

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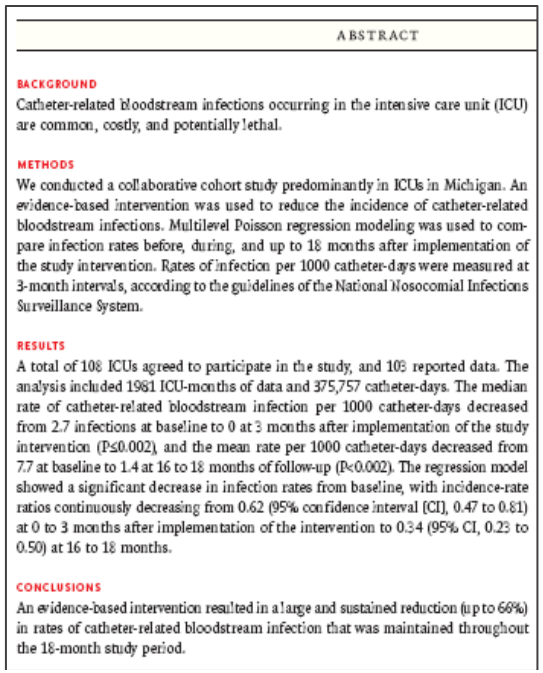
Pronovost P, et. al. An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU. The New England Journal of Medicine, 2006, 355:2725-32

- Link to Abstract (HTML)

Link to Full Text (PDF)



ABSTRACT

BACKGROUND

Catheter-related bloodstream infections occurring in the intensive care unit (ICU) are common, costly, and potentially lethal.

METHODS

We conducted a collaborative cohort study predominantly in ICUs in Michigan. An evidence-based intervention was used to reduce the incidence of catheter-related bloodstream infections. Multilevel Poisson regression modeling was used to compare infection rates before, during, and up to 18 months after implementation of the study intervention. Rates of infection per 1000 catheter-days were measured at 3-month intervals, according to the guidelines of the National Nosocomial Infections Surveillance System.

RESULTS

A total of 108 ICUs agreed to participate in the study, and 103 reported data. The analysis included 1981 ICU-months of data and 375,757 catheter-days. The median rate of catheter-related bloodstream infection per 1000 catheter-days decreased from 2.7 infections at baseline to 0 at 3 months after implementation of the study intervention ($P \leq 0.002$), and the mean rate per 1000 catheter-days decreased from 7.7 at baseline to 1.4 at 16 to 18 months of follow-up ($P < 0.002$). The regression model showed a significant decrease in infection rates from baseline, with incidence-rate ratios continuously decreasing from 0.62 (95% confidence interval [CI], 0.47 to 0.81) at 0 to 3 months after implementation of the intervention to 0.34 (95% CI, 0.23 to 0.50) at 16 to 18 months.

CONCLUSIONS

An evidence-based intervention resulted in a large and sustained reduction (up to 66%) in rates of catheter-related bloodstream infection that was maintained throughout the 18-month study period.

The NEW ENGLAND JOURNAL of MEDICINE

DECEMBER 28, 2006

An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU

Peter Pronovost, M.D., Ph.D., Dale Needham, M.D., Ph.D., Sean Berenholtz, M.D., David Sinopoli, M.P.H., M.B.A., Haitao Chu, M.D., Ph.D., Sara Cosgrove, M.D., Bryan Sexton, Ph.D., Robert Hyzy, M.D., Robert Welsh, M.D., Gary Roth, M.D., Joseph Bander, M.D., John Kepros, M.D., and Christine Goeschel, R.N., M.P.A.

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Translating Evidence to Practice

- Summarize the evidence
- Identify local barriers to implementing the intervention
- Measure performance
- Ensure all patients get the intervention

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Summarize the Evidence for Preventing Central Line Infection: 5 "Best Practices"

- Remove Unnecessary Lines
- Hand Hygiene
- Use of Maximal Barrier Precautions
- Chlorhexidine for Skin Antisepsis
- Avoid femoral lines

MMWR. 2002;51:RR-10

Central Line Cart

- Observed insertion of central lines
- Clinicians gathered equipment essential for complying with recommended practice (sterile gloves, full sterile drape, etc) from up to eight different locations!
- To make compliance easier for clinicians introduced a central line cart storing all the necessary supplies.

Identify and Address Local Barriers

- Nurses reluctant to question or challenge doctors who failed to follow recommended practice
- Physicians did not like being questioned by nurses in front of patients or other staff
- Clinicians agreed with the recommended practices, but cultural barriers prevented reliable delivery
- To address barriers, implemented a comprehensive safety programme that includes methods to improve culture, teamwork, and communication

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Comprehensive Unit Based Safety Program (CUSP)

- 1. Safety Culture Assessment
- 2. Science of Safety Training
- 3. Staff Identify Safety Hazards
- 4. Senior Executive Partnership
- 5. Learn from Safety Defects/Apply Tools to Improve
- 6. Reassess Safety Culture

ICUs also implemented

- A daily goals sheet to improve clinician-to-clinician communication within the ICU
- An intervention to reduce the incidence of ventilator-associated pneumonia
- A comprehensive unit-based safety program to improve the safety culture

Measures Performance

- Chose infection rates (an outcome measure) because
  - Centers for Disease Control provides standardised, scientifically rigorous definitions
  - Hospitals already collect data on infections
- Could not develop a valid and feasible measure of compliance with evidence based practices for central line insertion because lines are placed randomly
  - Coordination of independent observation difficult
  - Self reported compliance likely to overestimate performance

4 E's

- Engage
- Educate
- Execute
- Evaluate

Execute: Converted 5 evidence based behaviors to a Checklist

- Before the procedure, did they:
  - Wash hands
  - Sterilize procedure site with chlorhexadine
  - Drape entire patient in a sterile fashion
- During the procedure, did they:
  - Use sterile gloves, mask and sterile gown
  - Maintain a sterile field
- Did all personnel assisting with procedure follow the above precautions

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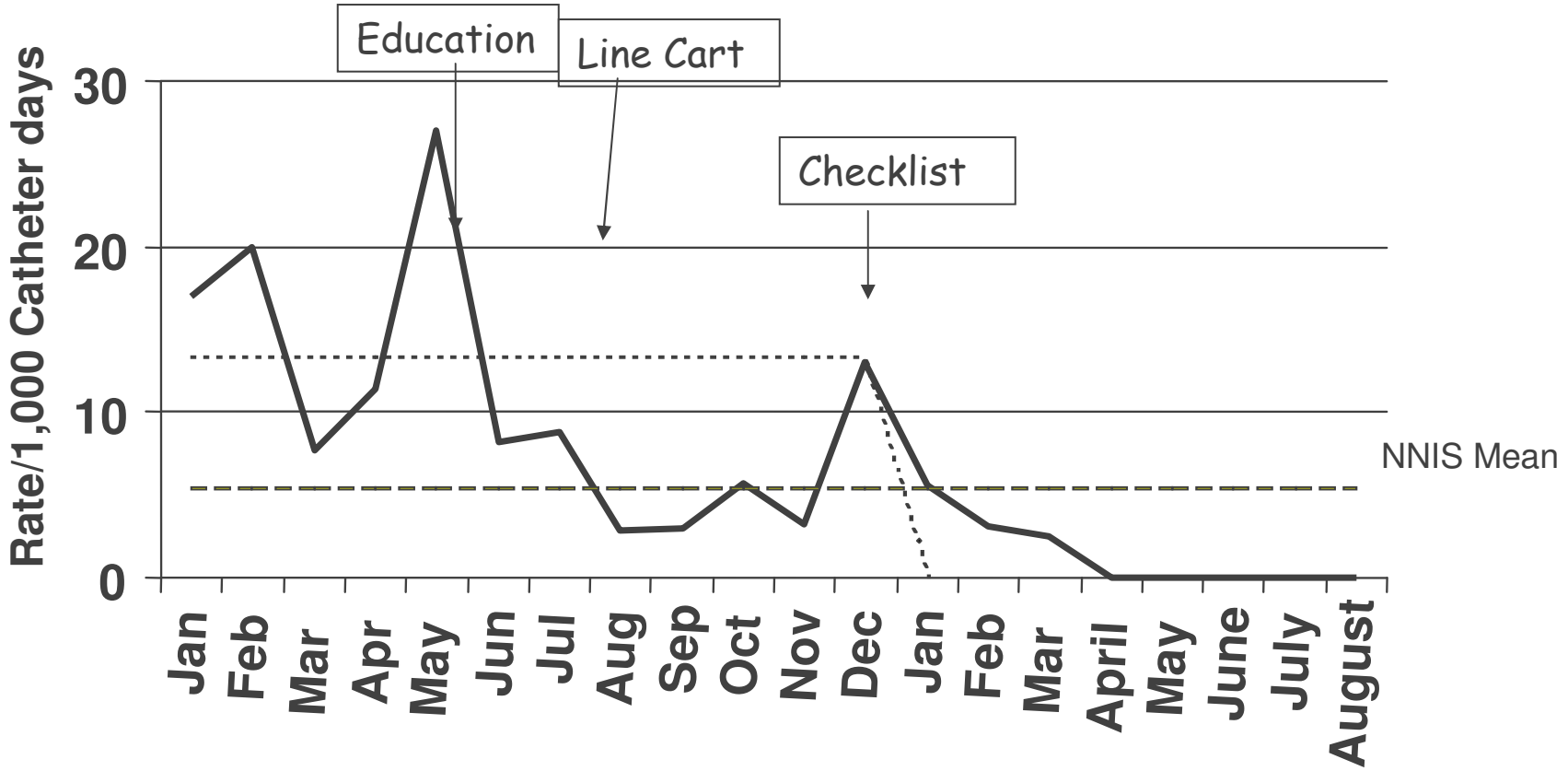
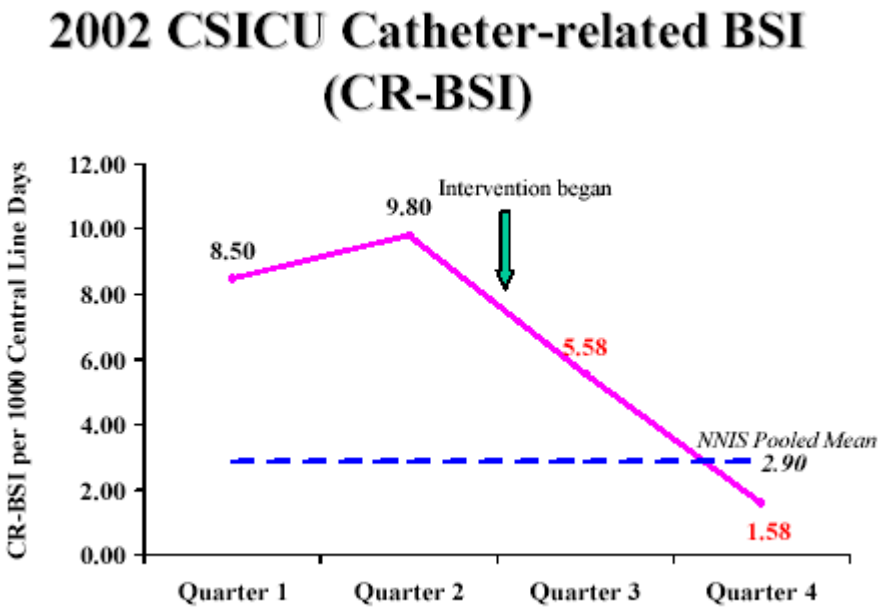
Evaluate: ICU catheter-related blood stream infections



Evaluate and Feedback



Your To Do List

- Establish team; include executive
- Pick area and outcome
- Measure performance
- Implement intervention
  - Protocol, independent check, failure modes
- Document improvements

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Safety Challenge

- 234 M surgeries globally
- Death 0.4-0.8%
- Complications 3-16%
- 1 million deaths
- 7 million disabling complications

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Ten Objectives of Safe Surgery Saves Lives

1. Correct patient / correct site
2. Prevent harm from anaesthetics
3. Prepare for airway emergencies
4. Prepare for high blood loss
5. Avoid allergies
6. Minimize surgical site infections
7. Prevent retention of instruments/ sponges
8. Accurately secure and identify specimens
9. Effectively communicate critical information
10. Establish surveillance of capacity/ volume/ results

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SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▶▶▶▶▶▶▶▶▶ Before skin incision ▶▶▶▶▶▶▶▶▶▶▶▶▶ Before patient leaves operating room

SIGN IN

☐ **PATIENT HAS CONFIRMED**
- IDENTITY
- SITE
- PROCEDURE
- CONSENT

☐ **SITE MARKED/NOT APPLICABLE**

☐ **ANAESTHESIA SAFETY CHECK COMPLETED**

☐ **PULSE OXIMETER ON PATIENT AND FUNCTIONING**

DOES PATIENT HAVE A:

KNOWN ALLERGY?
☐ NO
☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
☐ NO
☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?
☐ NO
☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

☐ **CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE**

☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM**
- PATIENT
- SITE
- PROCEDURE

ANTICIPATED CRITICAL EVENTS

☐ **SURGEON REVIEWS:** WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?

☐ **ANAESTHESIA TEAM REVIEWS:** ARE THERE ANY PATIENT-SPECIFIC CONCERNS?

☐ **NURSING TEAM REVIEWS:** HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
☐ YES
☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
☐ YES
☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

☐ **THE NAME OF THE PROCEDURE RECORDED**

☐ **THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT** (OR NOT APPLICABLE)

☐ **HOW THE SPECIMEN IS LABELLED** (INCLUDING PATIENT NAME)

☐ **WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED**

☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT**

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Concluding remarks

- Understanding context, evidence, culture change, rigorous measurement, evaluation and feedback needed
- Sustainability also important

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b. Estimate, Educate, Execute, Eradicate
c. Engage, Educate, Execute, Evaluate
d. None of the above

Interactive

- Participants identify local barriers to implementation of safe surgery guidelines

Questions?

Thank You

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