

Central Line Bloodstream Infections in Coronary Care Unit

Zero central line blood stream infections in Coronary Care UNIT (CCU)

Dr. Ahmad Hakawi, Dr. Clara Viorica Demeter, Mrs. Mercy Joseph, Mr. Mahmoud Mukahal , Sonimol Chandy

Introduction

Central line associated blood stream infection (CLA BSI) cause considerable morbidity, mortality and health care costs. Approximately 90% of the catheter-related blood stream infections occur with catheters inserted in central veins. The attributable mortality for central line infections is 18%. The attributable cost per CLA BSI is estimated to be between 3,6700 and 29,000 \$.

Objective

- To decrease the rate of CLA BSI to less than 4 /1000 central line-days.
- Improve the central line insertion and management by re-enforcing central venous catheter bundles.

Methods

FOCUS- PDCA is a quality improvement model was used by the multidisciplinary team to identify problems and a root cause analysis tool performed to identify causes behind the increased rate of CLA BSI. The team implemented evidence based interventions then measure their impact on CLA BSI.

Results

The multidisciplinary efforts showed remarkable impact on the CLABSI reduction in the CCU, the rate decreased from 13.83 /1000 central line-days in 2010 to Zero by 2011 and remained Zero up to date despite of the similar utilization ratio.

FOCUS

Find an opportunity

Increased number of CLA BSI infection in the Coronary Care Unit.

Organize team to improve the process:

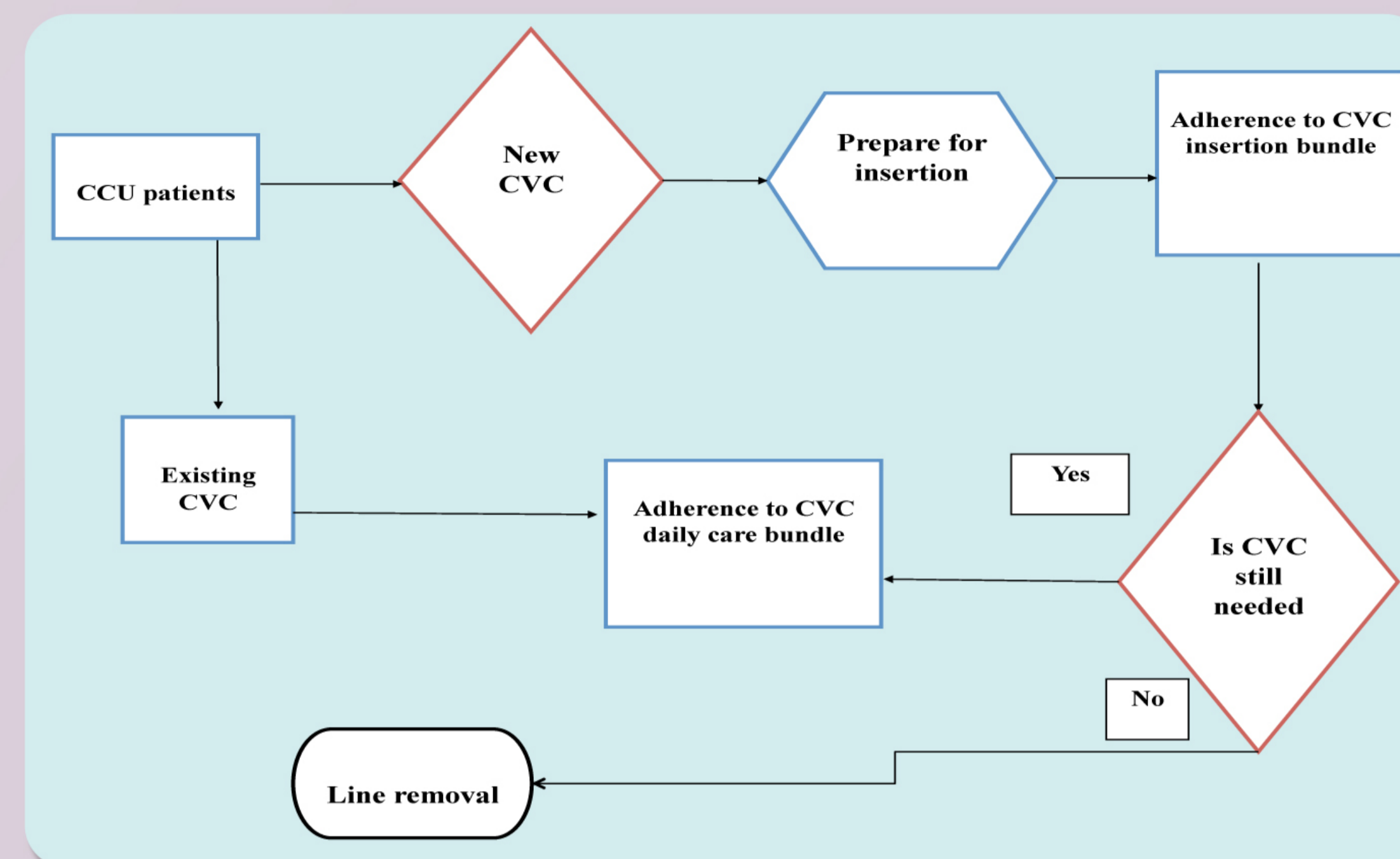
Infection control group was established under the guide and supervision of Infection Control Administration.

Members of Infection Control Group:

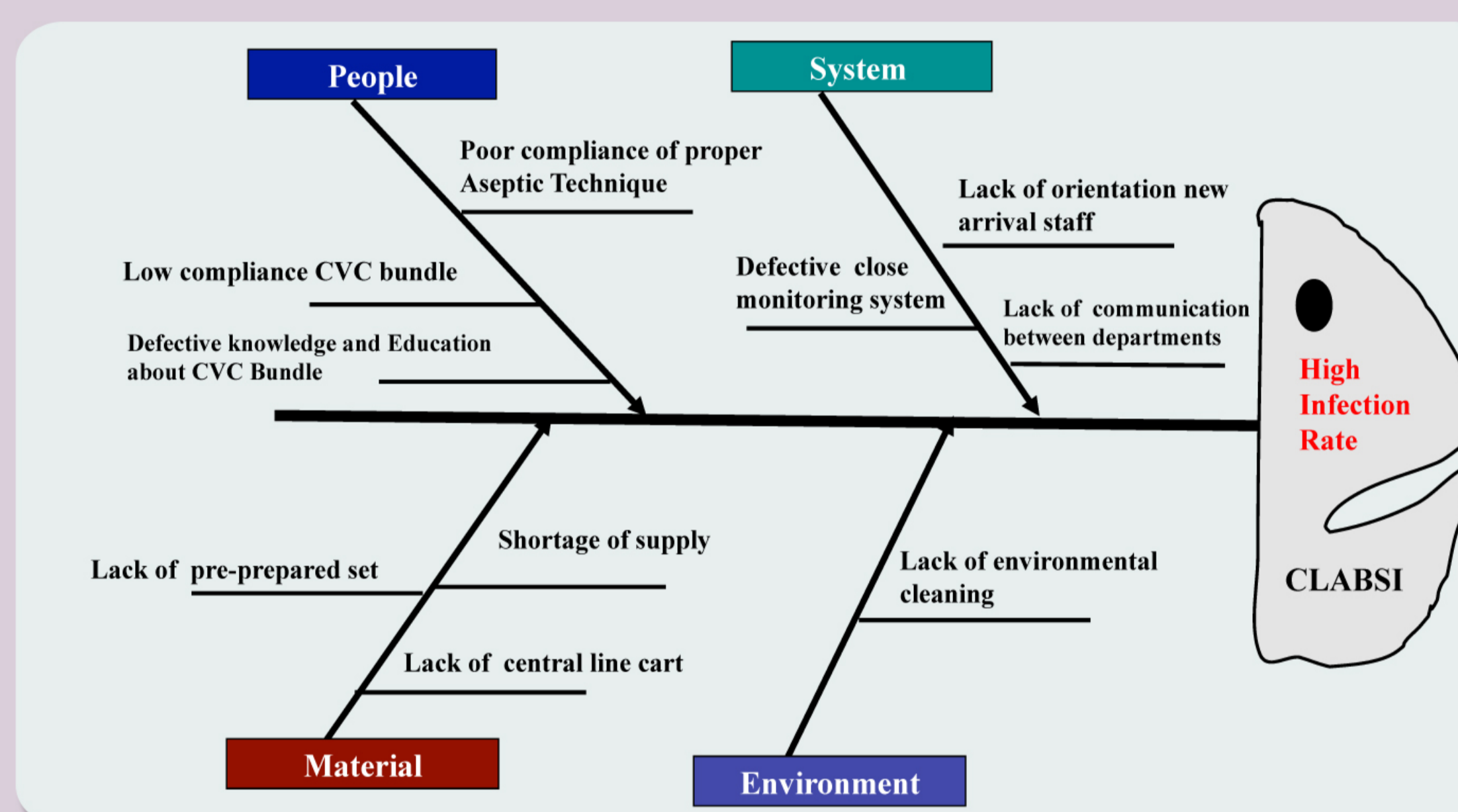
Infection Control Administration: Dr. Ahmad Hakawi, Dr. Clara Viorica Demeter, Mrs. Mercy Joseph, Mr. Mahmoud Mukahal, Mr. Edwin Briones, Mrs. Sonimol Chandy.

CCU: Dr. M. Koudieh,, Rujinah B. Jasmin Subnabi Tharamal, Virgie Amita

Clarify the knowledge of the current process



Understand sources of process variation



Select a strategy for process improvement

1. Re-enforce central line insertion and management bundles

| Insertion | Daily care |
|---|---|
| 1 Hand hygiene before catheter insertion | 1 Daily revision of central line for possibility of removal |
| 2 Personal protective equipment | 2 Daily inspection of the line for sign of infections |
| 3 Barrier precautions-patient covered by long drape | 3 Hand hygiene before accessing the line |
| 4 Pre-prepared set available for use | 4 Hub swabbed with alcohol before access |
| 5 Chlorhexidine used as skin antiseptic | 5 Cap changed whenever the line is accessed |
| 6 Time allowed for antiseptic to dry | |
| 7 Sterile field maintained during insertion | |
| 8 Level of training of the inserter | |
| •Consultant | |
| •Assistant consultant | |
| •Senior resident | |
| •Junior resident | |

2. Enhance Staff education and feedback

| Place | Topic | Time |
|----------|--|--------------------|
| Bed side | Hand hygiene | January -September |
| workshop | Central line insertion and management bundle | January -September |

PDCA

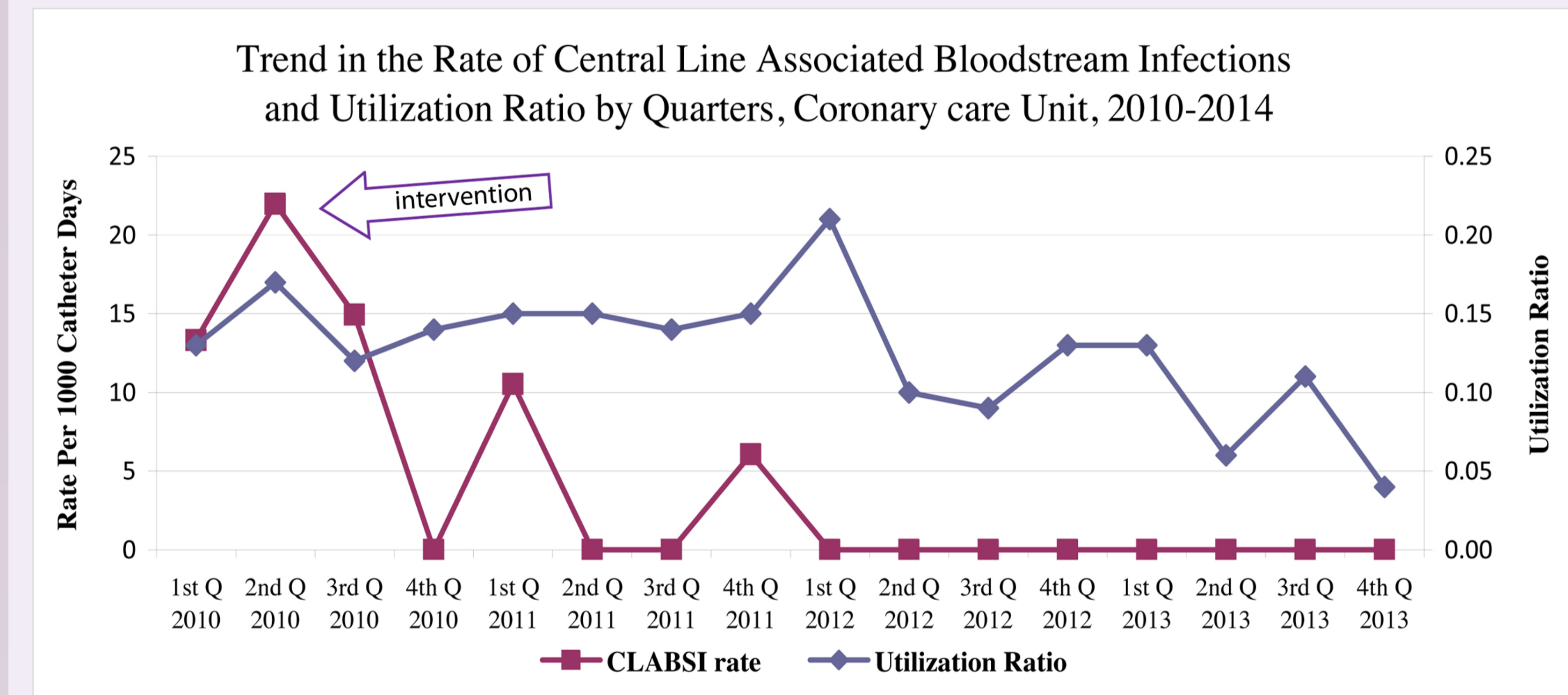
Plan the improvement

- Decide about bundle's components
- Identify process and outcome indicators
- Design, test, edit and distribute forms for data collection
- Perform Daily rounds to observe compliance with specific bundle components
- Establish the education program for staff: topic, place, timeline
- Select infection control advocate officers
- Prepare Infection Control Bulletin
- Schedule for Infection Control group meeting

Do the improvement and monitor the result

- Identify and report patients with CLA BSI
- Count number of patient-days and central line days
- Measure Rate of CLA BSI(outcome indicator)
- Measure Utilization rate (process indicator)
- Measure compliance rate with each component of Central line insertion and maintenance bundle(process indicator)
- Identify areas with potential for improvement

Check and study the results



Act on continuous improvements

- Focus for implementation of bundle in deficient areas
- Inform staff bout their achievements
- Keep excellent communication and feedback with members of Infection Control group and CCU staff

Conclusions:

FOCUS-PDCA improvement methodology and multidisciplinary efforts for the implementation of Central line associated blood stream infection prevention program such as insertion and maintenance bundle, improvement in hand hygiene practices, staff education and feedback had resulted in significant long term reduction of CLA BSI (Zero) in Coronary Care Unit.