Towards Zero Tolerance for Catheter-Related Bloodstream Infection (CRBSI): Combining Hospital-wide and Targeted Strategies

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Introduction

- CRBSI:
  - serious healthcare-associated event with high mortality and sinister complications
  - largely preventable, with many lives and much cost saved, by evidence-based best practice from line insertion to daily care "Central Line Bundle"
- A strategic hospital-wide CRBSI prevention program, with the support of a clinical leader and engagement of stakeholders of targeted clinical units, was designed and launched by phases at PMH
- Objective: To reduce the overall number of CRBSI episodes associated with central lines per year, and hence CRBSI rate, with focuses on the units of high central line usage.

Methods

1. Surveillance:
   a) Set up electronic ward-based surveillance "eWard" on the usage of central lines (catheter days) in 2007.
   b) Identify the source of any bacteremia by clinical case review.
2. Pilot program (2008), adopt "Central Line Bundle"* at ICU → adult Renal Unit →other major central line users.

   *Line Insertion:
   - Hand hygiene
   - Maximal barrier precautions
   - Chlorhexidine skin antisepsis
   - Optimal catheter site selection, avoid using the femoral vein

   *Line care:
   - Daily review of line necessity
   - Daily assessment of catheter site condition
3. Hospital-wide program (2010):
   1. standardize clinical equipment, produce manual, central line insertion checklist, daily assessment form, photo guides, training video, standard reporting.
   2. enlist support from a clinical leader (ICU) to share experience with all other units and to help offer training.
4. Targeted approach: Regular meetings with stakeholders of individual major central line user to analyze the outcome and look for room for improvement.

Central Line Bundle: photo guide

2a. Prepare the Trolley
- Disinfect trolley with 70% alcohol

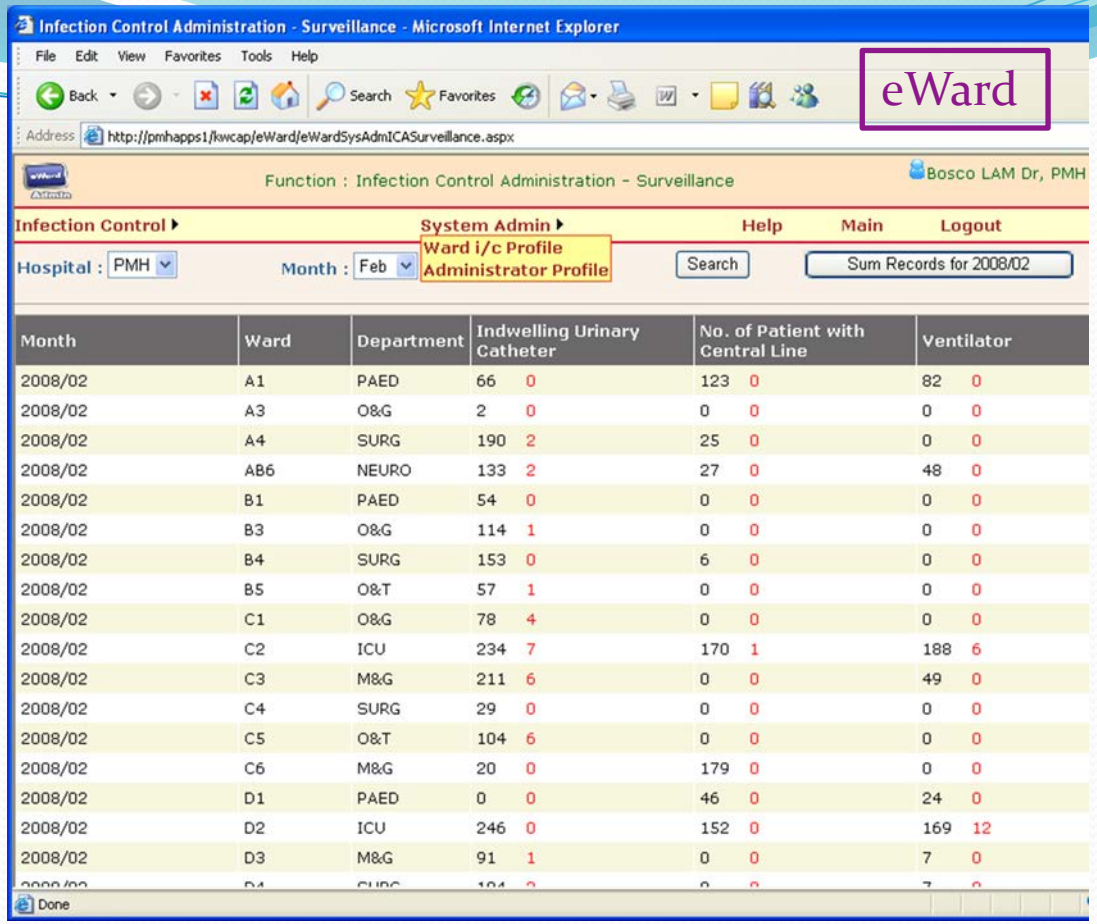
2b. Prepare the Equipment
- 2% Chlorhexidine in 70% Alcohol
- Suture set
- Sterile disposable drape (150 x 100 cm)
- Sterile towel
- Suitable central venous catheter + 1 more stand by

3. Perform Hand Hygiene
- Apply hand rub / wash hands

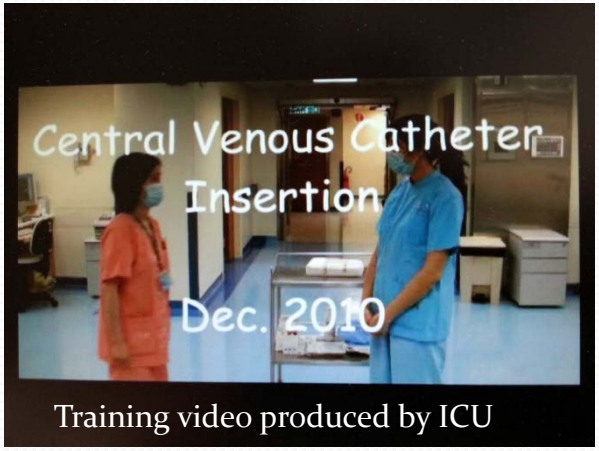
4. Apply Maximal Barrier Precaution for the Staff
- Wear sterile gown
- Wear sterile gloves

* Holding or clamping the tail end of the guidewire during the procedure.

6. Designate Sterile Field
- Place sterile towel around the puncture site first
- Use sterile disposable drape to **cover patient** with a small opening for the designated puncture site
- Maintain aseptic technique at all times
- Change sterile gloves if contaminated

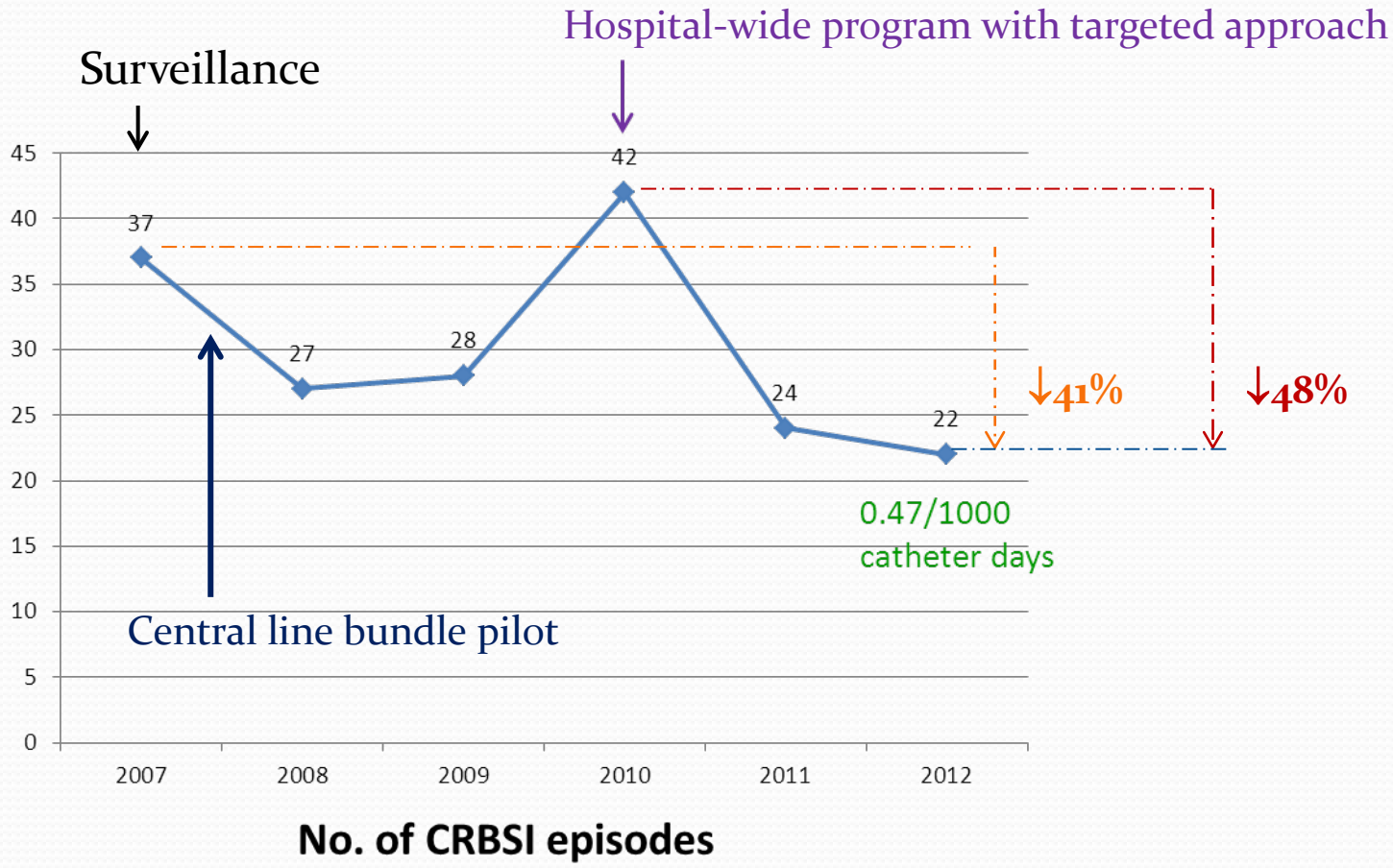


Month	Ward	Department	Indwelling Urinary Catheter		No. of Patient with Central Line		Ventilator	
2008/02	A1	PAED	66	0	123	0	82	0
2008/02	A3	O&G	2	0	0	0	0	0
2008/02	A4	SURG	190	2	25	0	0	0
2008/02	AB6	NEURO	133	2	27	0	48	0
2008/02	B1	PAED	54	0	0	0	0	0
2008/02	B3	O&G	114	1	0	0	0	0
2008/02	B4	SURG	153	0	6	0	0	0
2008/02	B5	O&T	57	1	0	0	0	0
2008/02	C1	O&G	78	4	0	0	0	0
2008/02	C2	ICU	234	7	170	1	188	6
2008/02	C3	M&G	211	6	0	0	49	0
2008/02	C4	SURG	29	0	0	0	0	0
2008/02	C5	O&T	104	6	0	0	0	0
2008/02	C6	M&G	20	0	179	0	0	0
2008/02	D1	PAED	0	0	46	0	24	0
2008/02	D2	ICU	246	0	152	0	169	12
2008/02	D3	M&G	91	1	0	0	7	0



Training video produced by ICU

Result



Conclusion: Clinical leader's support and engagement from stakeholders was essential in making great reduction in CRBSI rates possible and hence gearing the way ahead towards zero tolerance to CRBSI.