

BATTLING THE BUGS: REDUCING EARLY CATHETER-RELATED BLOODSTREAM INFECTION IN HAEMODIALYSIS PATIENTS

Yeo See Cheng & Chan Siew Mie
Department of Renal Medicine & Renal Unit

Mission Statement

To reduce catheter related blood-stream infection (BSI) in haemodialysis (HD) patients with newly inserted tunnelled dialysis catheter (TDC) by 80% over six-month period in Ward 9A and 11A

Team Members

	Name	Designation	Department
Team Leaders	Yeo See Cheng	Consultant	Renal Medicine
	Chan Siew Mie	Senior Nurse Manager	Renal Unit
Team Members	Timothy Koh	Consultant	Renal Medicine
	Benjamin Khoo	Senior Resident	Renal Medicine
	Jiang Nan	Nurse Clinician	Ward 9A
	Ooi Swee Ling	Assistant Nurse Clinician	Renal Unit
	Pua Uei	Senior Consultant	Radiology
	Gabrielle Chia	Senior Staff Nurse	Infection Control
Sponsor	Koh Zhi Min	Executive	CSI
	Adrian Liew	Head of Department	Renal Medicine

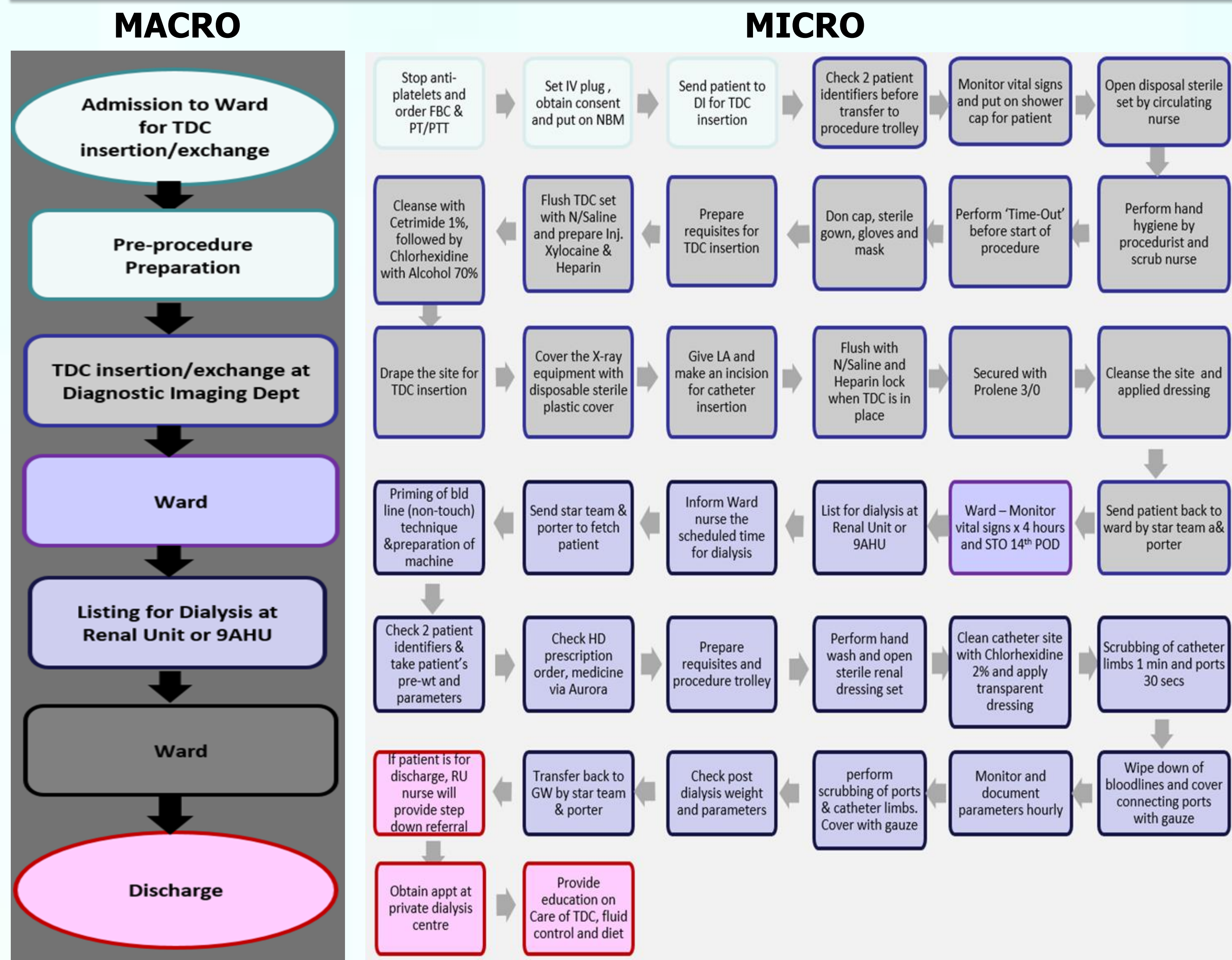
Evidence for a Problem Worth Solving

Dialysis catheter-related BSI is a leading complication in HD patients, associated with increased risk of mortality, additional invasive procedures, additional hospitalisation and/or increase in length of stay.

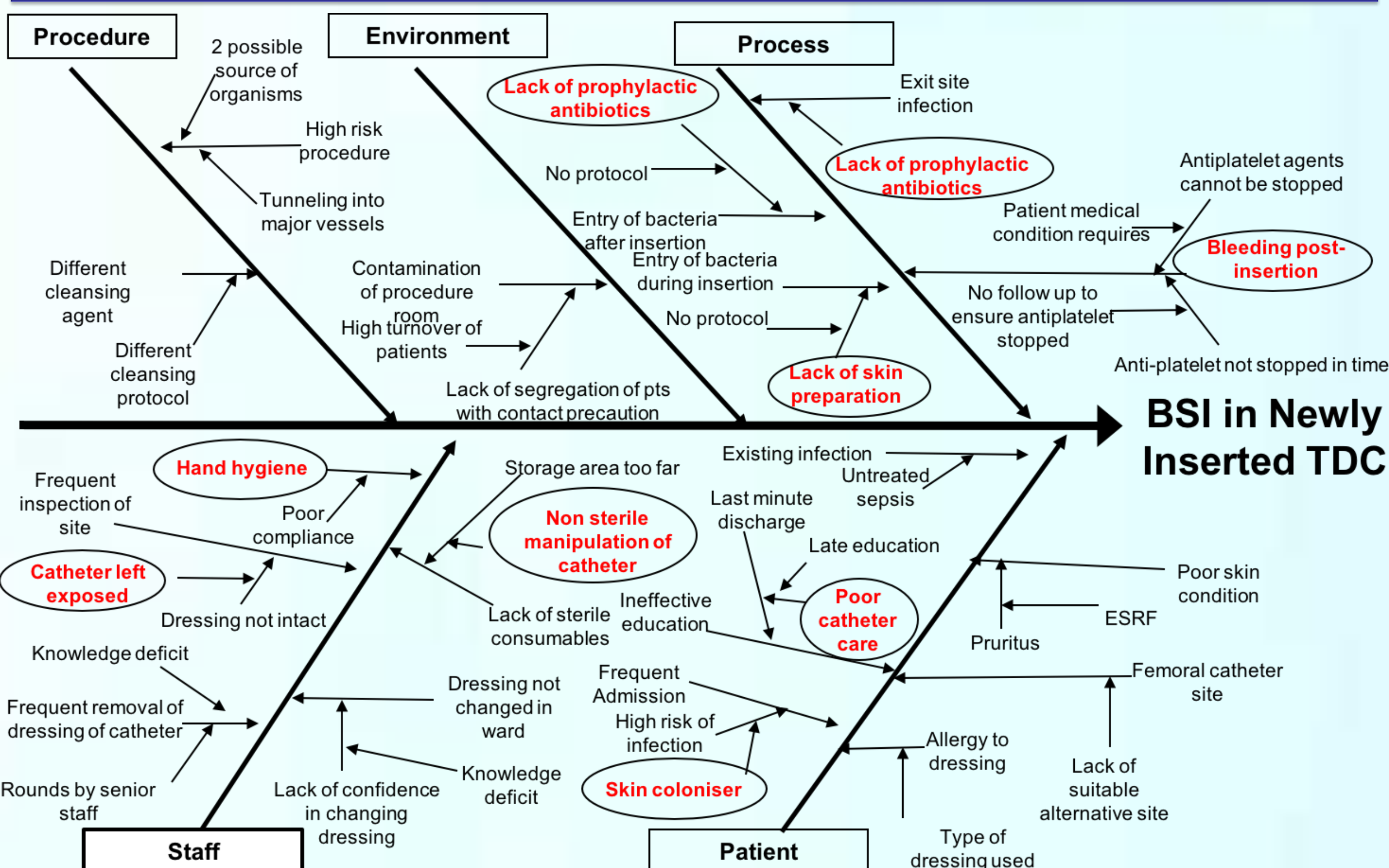
Current Performance of a Process

In 2014 and 2015, there were an annual average of 11.5 episodes of catheter-related BSI in HD patients that occurs after a newly inserted TDC in TTSH – a rate of 1.9 infections per 100 catheters inserted i.e. 1.9% of newly inserted TDC were infected.

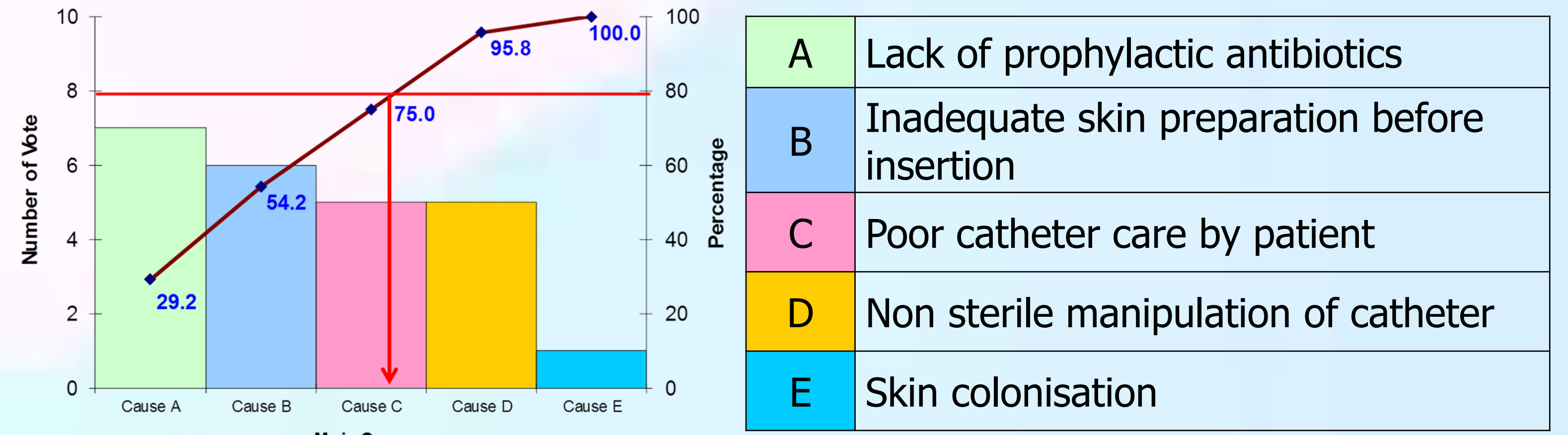
Flow Chart of Process



Cause and Effect Diagram



Pareto Chart



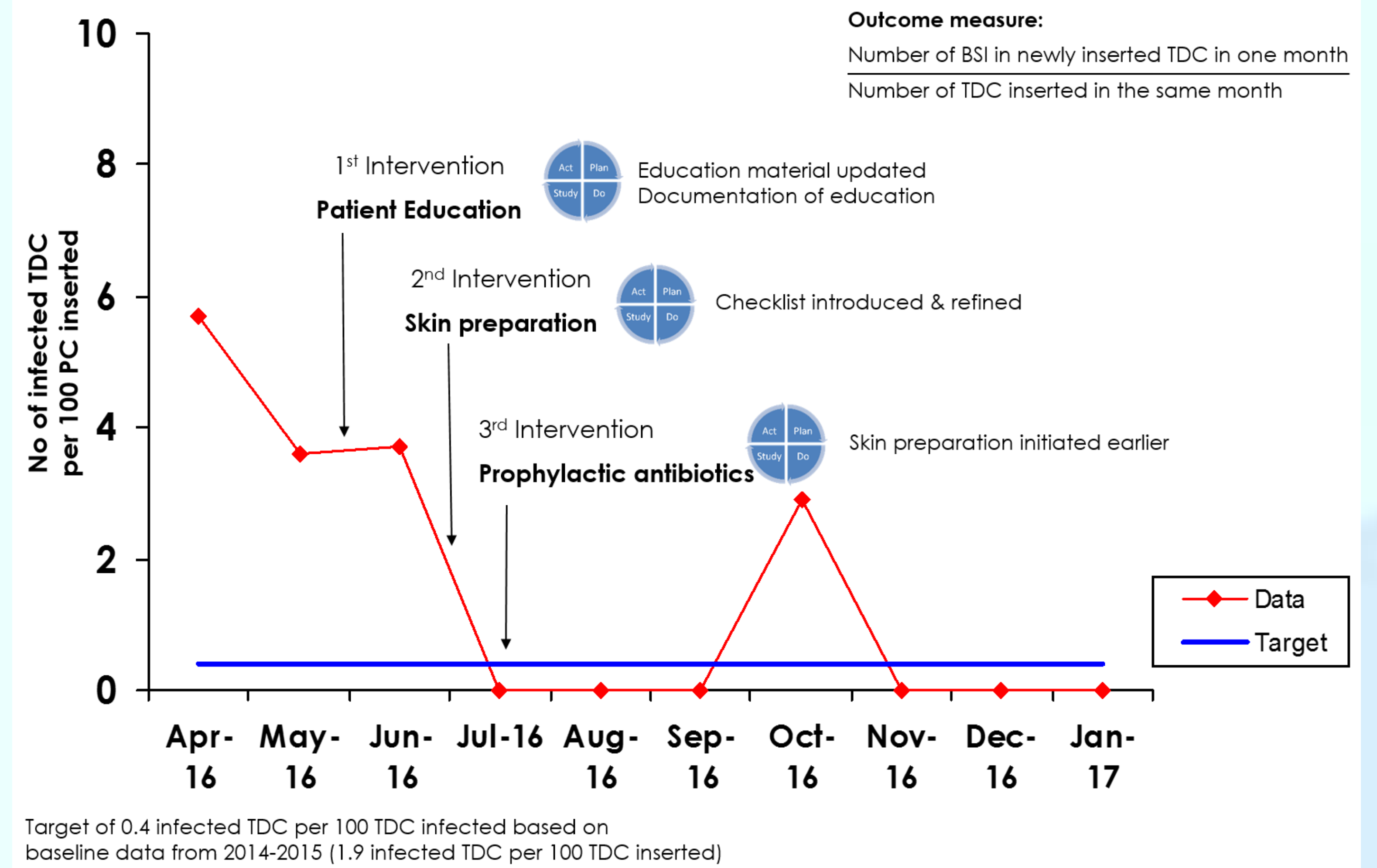
Implementation

CAUSE	INTERVENTION
Lack of prophylactic antibiotics	<ul style="list-style-type: none"> Prophylactic IV antibiotics before insertion Topical gentamicin to newly inserted TDC exit site
Inadequate skin preparation before insertion	<ul style="list-style-type: none"> Chlorhexidine wash to skin before insertion of TDC Nasal decolonisation for MRSA carriers
Poor TDC care by patient	<ul style="list-style-type: none"> Education on care of TDC <i>before</i> TDC insertion Education message reinforced in Ward 9A/11A and Renal unit <i>after</i> insertion Synchronised education message from Renal unit and Ward 9A/11A Education material to show pictures for clarity

Results

Pre intervention: 4 cases between April and June 2016

Post intervention: Only 1 case from July 2016 to January 2017



Cost Savings

Each episode of catheter-related MRSA bacteraemia is estimated to have a direct increased cost of \$5,645.81 to the patient (increased length of stay, additional procedures and treatment). Given that the interventions implemented cost \$53.52 per patient and assuming 50 interventions are necessary to prevent one episode of bacteraemia (historical infection rate of 1.9% and 600 new catheter insertions per year), the cost savings per episode of catheter-related BSI avoided is \$2,969.81 and the annual cost savings is estimated to be \$34,152.82.

The actual additional marginal healthcare cost of TDC-related BSI is likely higher (reported ~USD\$30,000 per episode of MRSA infection) and it is expected that the overall healthcare cost savings is substantial.

Strategies to Sustain

- Improve reliability of applying required processes / interventions:
1. Refine & simplify standardised protocol & checklist for interventions
 2. Process measure to document reliability of applying interventions
 3. Introduce forced function to ensure adherence

Identify interventions that are key to improving outcome measures