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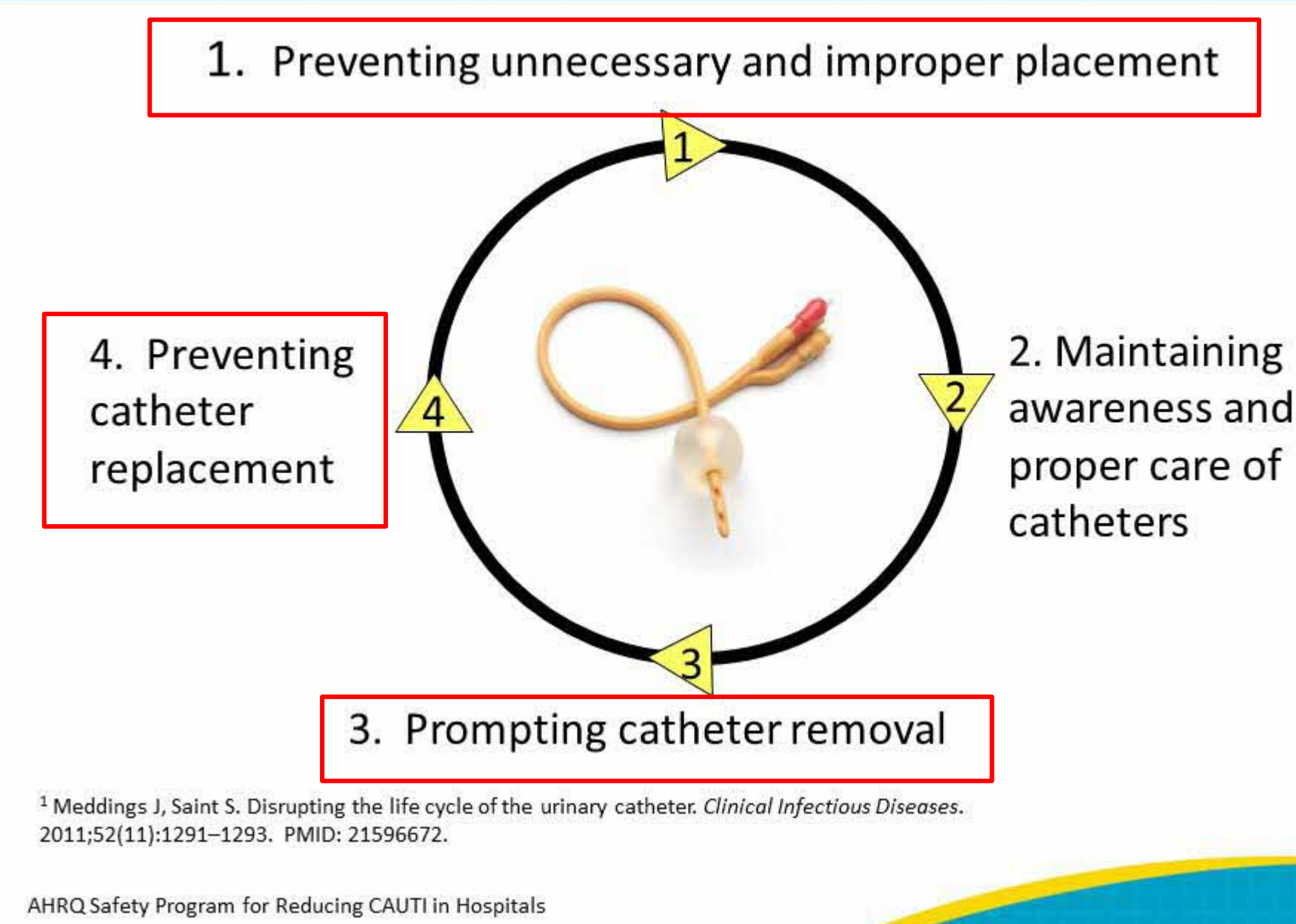
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## Mission Statement

To reduce catheter utilisation ratio and rate of CAUTI per 1000 catheter days by 10% over a period of three months (post-intervention) in three pilot wards with the highest catheter usage.

## Hypothesis

### Evidence-Based Guidelines and CAUTI Prevention<sup>1</sup>



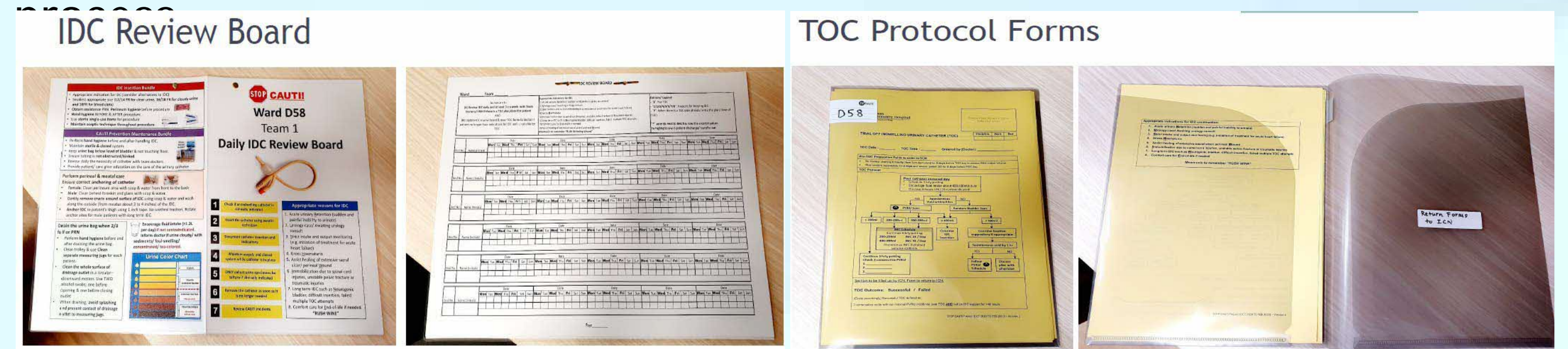
Early removal of urinary catheters is an effective strategy to prevent catheter-associated urinary tract infection (CAUTI) <sup>(1)</sup>. We hypothesized that a **standardized Trial-Off-Catheter (TOC) protocol** would reduce catheter utilisation and CAUTI rates in a community hospital setting.

## Design of a Trial-Off-Catheter (TOC) protocol

Literature reviews on best practices of TOC protocols (2,4,5,6)

CAUTI prevention workgroup (Multi-disciplinary team reviews)

Indwelling Catheter (IDC) review board and Trial-Off-Catheter (TOC) protocol were created to address the need for a structured and standardized process in **reviewing appropriateness to continue IDC and removal of IDC**. Multiple PDSA cycles were used designing.



## Implementation

- Three wards with high catheter usage were selected as pilot wards.
- Roadshows were then conducted for all HCWs at the three pilot wards.
- The Indwelling Catheter (IDC) review board and Trial-Off-Catheter (TOC) protocol were implemented in the 3 pilot wards over two months (intervention period)

## Literature Review

A standardized TOC protocol

- Reduces variation in practices among physicians/ nurses with different levels of experience with TOC. A protocolized care process ensure efficient utilization of resources to achieve the desired clinical outcomes for patients <sup>(2)</sup>.
- Provides a guide to resolve common issues such as hydration/ constipation to optimised successful catheter removal and reduce the catheter time <sup>(2)</sup>.
- Allows adequate opportunities for patients during rehabilitative phase to trial off IDC before catheters are placed permanently. This is especially relevant among cases of failure to remove catheter during hospital stay at the acute phase of illness <sup>(3)</sup>.

## Process Measures

Throughout 2-months of implementation and 3-months post intervention, weekly audits were conducted by the Infection Control Nurse to early identify problems and ensure proper implementation of interventions.

Process measures	SN	Definition of Process
IDC reviewed appropriately, %	1	Nurses review IDC daily for appropriate indications for IDC/ review PRN if there is a TOC plan or date & TOC protocol ordered for patient <sup>(1 point)</sup>
Appropriate usage of TOC protocol, %	2	Nurse issues the TOC Protocol to doctor if patient does not meet the appropriate indications for IDC to continue <sup>(1 point)</sup>
Compliance with TOC protocol, %	3	"Pre-TOC Preparation", bladder charting and bowel clearance <sup>(1 point)</sup>
	4	Scheduled 3 hourly potting and encourage fluid intake about 400-600mls over the next 6 hours UNLESS contraindicated <sup>(2 points)</sup>
	5	Nurse performs random bladder scan when NPU or PVRU after PU/BO, within 6 hours after TOC and inform result to doctor <sup>(1 point)</sup>

### Successful TOC :

- 3 consecutive voids with no/ minimal PVRU (<200mls) post TOC, and
- Patient is not on IDC support for >48 hrs

### (All completed TOC forms to be returned to ICN)

Cases where clinicians decide to deviate from protocol, will be excluded from outcome measure.

## Pre & Post Intervention Measures

Outcome measures	Pre-intervention period (Baseline)				Implementation period	Post-intervention period				Differences	
	(Jul 2020 - Sep 2020)					Oct 2020 - Nov 2020	(Dec 2020 - Feb 2021)				
	Sub Acute	Sub Acute	Rehab	Total			Sub Acute	Sub Acute	Rehab		Total
	D58	D98	D97		D58	D98	D97				
No. of CAUTI events	0	2	0	2		0	1	0	1	↓ 1	
No. of urinary catheter days	145	282	251	678		194	239	176	609	↓ 69	
No. of inpatient days	2061	1881	2369	6311		1555	2474	2671	6700	↑ 389	
Rate of CAUTI per 1000 urinary catheter days	0.0	7.1	0.0	2.9		0.0	4.2	0.0	1.6	↓ 45%	
Ratio of Urinary catheter utilisation	0.07	0.15	0.11	0.11		0.12	0.10	0.07	0.09	↓ 18%	
Percentage of successful TOC	83%	67%	25%	64%		67%	81%	80%	77%	↑ 13%	
Percentage of IDC reviewed appropriately	20%	46%	50%	42%		95%	93%	83%	91%	↑ 49%	

**Time Savings:** Over three months post-implementation of TOC protocol, 69 catheter days were reduced. For every catheter day reduced, nurses will also save approximately 1 man-hour per day in caring for patient with IDC. Extrapolating this, in a 1 year period, the nursing team can approximately save 276 man-hours.

### Savings in Nursing Staff Man-hours

Nursing Activities in caring for patient with IDC	Approximate time saved for each catheter day reduced/Day	Catheter days saved within 3 months	Approximate time saved for each catheter day reduced/Year
Draining of the Urine bag, include documentation at least once per shift	0.5 Hr	69	(0.5 Hr x 69 days) x 4 = 138 Hrs
Performing perineal-meatal care, include documentation at least once per shift/ after bowel movement	0.5 Hr		(0.5 Hr x 69 days) x 4 = 138 Hrs
<b>TOTAL</b>	<b>1 Hr</b>		<b>276 Hrs</b>

**Results:** Three months post-intervention, three pilot wards' overall catheter utilisation ratio was reduced by 18% and rate of CAUTI per 1000 catheter days reduced by 45%. Out of 35 TOC protocols carried out, there was zero CAUTI event related to the use of protocol and 77% successful catheter removal was achieved. This is an improvement by 13% from baseline data. The percentage of IDC reviewed appropriately by nurses/ doctors have also increased by 49% from baseline 42% to 91%.

## Conclusion

Project aim achieved. As part of a multimodal CAUTI prevention strategy, implementation of a TOC protocol for early removal of urinary catheter can effectively reduce catheter utilisation and CAUTI rates.

## Sustainability & Spread

With positive results seen and support from various stakeholders, the TOC protocol was spread to remaining Yishun Community Hospital wards.

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