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Urology Cystoscopes "Milkrun"

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Background

Between 2016 and 2018, Urology Centre performed an average of 3491 flexible cystoscopy yearly. As the centre independently reprocessed their own flexible cystoscopes (scopes) before and after each procedure performed, it resulted in:

1. Limitation in turnaround time

Whenever the scope and/or AER machine were down, procedures had to be greatly reduced or postponed, disrupting the supply chain and service flow.

2. Inadequate reprocessing

Space constraints within Urology Centre posed as a challenge towards the physical separation of "clean" and "dirty" areas. The centre was not an ideal site for scope reprocessing.

The Integrated Endoscope Reprocessing Committee was formed in 2016, and Inpatient and Lung Endoscopy Centre (ILEC) was designated to centrally reprocess the scopes of Urology Centre. ILEC was strategically chosen due to the close proximity to Urology Centre and its capacity to keep up with a short turnaround time of 30mins of each scope procedure. Renovation of ILEC was completed in April 2019 and a workgroup comprising of diverse expertise was setup in October 2019 to review the "milkrun".

Aims

The main objectives of the workgroup are to ensure and develop:

1. A **seamless turnaround** of scopes between Urology Centre and ILEC with minimal disruptions to the procedures.
2. An **integrated, safe and efficient reprocessing system** in compliance to international standards.

Methodology

Step 1: Baseline time and motion analysis was carried out to determine the planning parameters in order to ensure that the procedures and reprocessing will be carried out safely and smoothly.

- Procedure Duration (Prep, Procedure, Room cleaning): 40mins
- Scope Reprocessing Duration: 45mins (2 scopes per AER machine)
- Transportation Duration to/fro ILEC: 20mins

Step 2: Entire process was mapped out to identify constraints.

- 4 scopes in inventory
- 1 Automated Endoscope Reprocessor (AER) – processes 2 scopes at a time
- Up to 3 months downtime for a scope repair
- Up to 3 days downtime if AER machine is down
- "Clean" scope needs to be used within 1hr after removal from drying cabinets
- "Dirty" scope needs to be sent to ILEC for reprocessing within 30mins to prevent formation of biofilm, which makes reprocessing more challenging
- Sufficient scopes for use after office hour

Step 3: Prioritisation matrix was established to rank the proposed solutions.

Criteria* / Weightage / Solutions	Cost Effectiveness (0.2)	Process Efficiency (0.4)	Space Saving (0.4)	Weighted Score	Rank
Purchase more scopes + accessories	3	2	3	2.6	1
Purchase more AER machines + incur recurring OPEX	1	2	1	1.4	2

** Rank score 1 to 3, with 1 being the least favourable and 3 being the most favourable*

Step 4: Optimisation analysis was performed to determine the optimal number of scopes required for the "milkrun".

- After multiple simulations, it was derived that 12 scopes will be required to ensure continuity of service – procedure, reprocessing and even during downtime
- Potential daily scope workload was deduced to be 28 (14 per procedure room)

No. of scopes	12																		
Timeline	0730	0745	0800	0815	0830	0845	0900	0915	0930	0945	1000	1015	1030	1045	1100	1115	1130	1145	1200
ILEC - AER 1 (45mins)	2			2			2			2 (Dirty)			2 (Dirty)				2 (Dirty)		
ILEC - AER 2 (45mins)	2			2			2 (Dirty)			2 (Dirty)									2
HCA's trip To /froEC				X			X			X	X		X			X		X	
Uro Centre - Clean, unused Scopes				4	2		4		2	4	2		2		0	2	0	0	
Uro Centre - Scopes in Use@ Prostate/ Cysto Rooms (30mins)				0	2		2		2	2	2		2		2	2	2	0	
Uro centre - Dirty Scopes (pending sending)				0	0				2	0	0		0		2	0	0	0	
ILEC - Inventory (incldues in AER & Drying Cabinets)	12	12	12	8	8		6		6	6	8		8		8	8	10	12	
TOTAL	12	12	12	12	12	0	12	0	12	12	12	0	12	0	12	12	12	12	0

2 scope procedures can be done every 30mins

Step 5: Structured training, e-competency & assessment were conducted for the staff

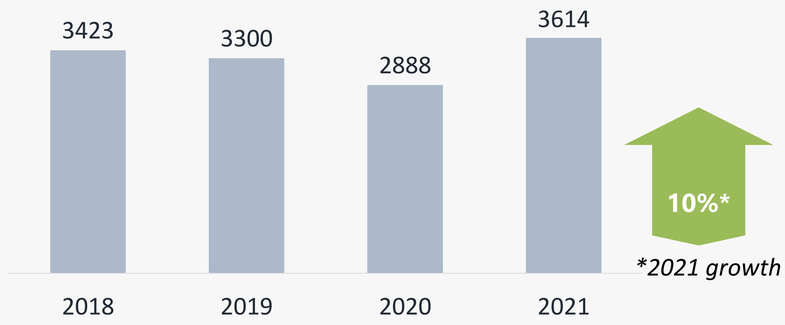
- Training was conducted by ILEC to ensure that staff and doctors of Urology Centre are competent in the handling of scopes.
- Trained senior nurse manager was assigned to have oversight over procedure rooms
- It has become a nursing requirement to complete yearly e-competency test for compliance to reprocessing standards.

Staff training conducted to ensure nurses' competency

Results

✓ **Increased patient workload**

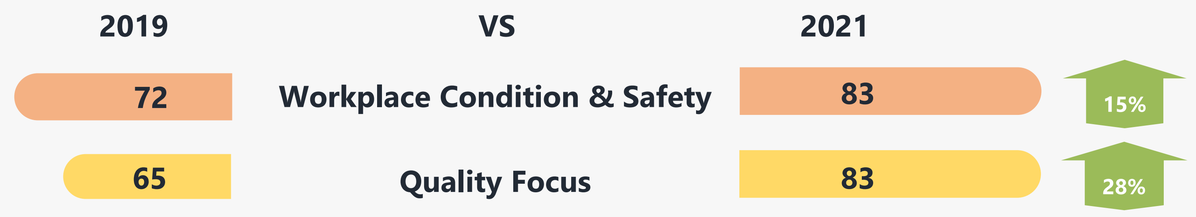
With the implementation of the integrated reprocessing workflow, the efficiency of scope turnaround has significantly improved. This translates to an increase in patient workload. To cater to the growing needs of Urology services, there is also much room for growth (93%) till the procedure workload reaches maximum capacity.



**2021 growth rate in comparison to 2019*

✓ **Improved staff satisfaction towards safe working environment**

Based on the SingHealth Employee Engagement Survey (EES) 2021 results, staff of Urology Centre has rated higher for "Workplace Condition & Safety" and "Quality Focus" as compared to 2019. Nurses are contented that they can focus on improving quality of care in a clinical setting and better delivery of service excellence to our patients.



✓ **Manpower & time savings**

Urology Centre nurses have been freed up to perform clinical work. The improved workflow has resulted to 1 staff nurse FTE of manpower savings.

✓ **Cost savings**

With centralized reprocessing, the disinfectants required to reprocess the scopes (e.g. Rapicide) have been removed from Urology Centre. Local regulatory requirement for SPF License and CCTV monitoring to store the solutions in the premise has been eliminated.

With more scopes to turnaround as well as formalised training in place, the number of scope repair has reduced by about 25%, where the repair/replacement cost of a scope may go up to $15000.

✓ **Right skillsets have been accurately utilised**

✓ **Compliance to international endoscope reprocessing standards & infection control**

✓ **Aligned with the hospital's strategic goals**

(1) Patient Safety
(2) Infection Prevention
(3) Safer Work Environment
(4) Strict Compliance to Established Policies & Procedures

Conclusion

Since Jan 2021, Urology Centre has officially handed the scope reprocessing over to ILEC. The project has successfully resulted in an increase in procedure workload with minimal disruption to scope procedures and reprocessing "milkrun". The results achieved – manpower, time and cost savings are long-term yields. The combined efforts and buy-ins from different stakeholders have been vital to streamline and optimize the reprocessing workflow, which emphasizes patient care, safety, and sustainability, in line with hospital's strategic goals. There has since been monthly review with stakeholders for refinement of process workflow in Urology Centre and ILEC to ensure continuous optimization of scarce resources.