

Redesigning Endoscopy: Optimizing Processes and Patient Satisfaction



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1. PROBLEM Statement

The former Mount Elizabeth Hospital (MEH) endoscopy facility faces significant operational challenges, including capacity constraints, inefficient workflows, outdated infrastructure, and discomfort for both staff and patients, all of which contribute to delays, reduced efficiency, and a compromised patient experience.

2. BACKGROUND Information

The project was implemented in the Endoscopy Department at MEH, as part of MEH Project Renaissance, commencing in 2022 and culminating in the relocation to an upgraded facility in June 2024. Through regular stakeholders’ engagement and feedback sessions, the multidisciplinary team ensured that the project aligned with clinical and operational needs.

3. AIM Statement & TARGET

1. To improve the operational efficiency in Endoscopy Centre within 3 months of relocation.
2. To increase the Net Promoter Score (NPS) by 20% within 3 months of relocating Endoscopy Centre.

4. MEASURE & INDICATOR

1. **Measure:** Improvement in Turnaround Time (TAT) of Procedure Room
Indicator: 20% reduction in procedure room TAT
2. **Measure:** Reduction in Manual Labour for Nurses
Indicator: 10 hrs reduction in manual labour per month
3. **Measure:** Patient Experience Feedback
Indicator: 20% increase in NPS

5. CHANGE STRATEGY

Patient-Centered Architectural Design:

1. **Facility Expansion:** Floor area increased from 8,100 sqft to 18,030 sqft, optimizing space and workflow.
2. **Procedure Room Capacity:** Increased from 6 to 7 rooms, reducing wait times and enhancing access to care; includes a negative pressure and isolation room for safer specialized procedures (e.g. ERCP, EBUS).
3. **Bed Capacity:** 38 recovery rooms (up from 30), including 17 double-bed rooms, 1 isolation room, and 3 single rooms, improving comfort, privacy, and infection control.
4. **Infection Control:** Clean vs. dirty corridors reduce cross-contamination; isolation rooms ensure safer environments for infectious or immunocompromised patients.
5. **Flexible Spaces:** Isolation room supports bronchoscopy during peak times, ensuring uninterrupted care and reducing delays and anxiety.
6. **Recovery Room Partition:** Optimizes space while maintaining patient privacy.

Automation, IT & Robotics Innovation

1. **Autonomous Scope Delivery Robot:** Automates scope transport between procedure rooms and the reprocessing room, enhancing staff efficiency.
2. **Standardized Philips Patient Monitors:** Simplify equipment use, automate data transcription into the Electronic Health Record (EndoSys), and enable customizable reminders for timely patient monitoring, increasing efficiency and reducing errors.
3. **Dirty Utility Face Recognition:** Improves hygiene by eliminating physical contact, reducing cross-contamination risks in infection-prone areas. It also increases efficiency by allowing quicker access through hands-free operation.
4. **Digital Ward Census Display:** Improves resource management, patient flows and communication within the ward.

Artificial Intelligence and Digitalization

1. **SmartPeep A.I. Fall Prevention System:** Provides real-time alerts to nursing staff when high fall-risk patients attempt to leave the bed or experience a fall.
2. **Digital Nurse Organization Chart:** Promotes communication and trust. Also provides patients with a clear understanding of their care team.

6. RESULTS

- After 6 months of relocation of Endoscopy Centre:
1. The number of procedure rooms that were turned over in under 20 minutes increased by almost 54%, from 52% (n=3069) from Jan-Jun 2024, to 83% (n=3545) from Jul-Dec 2024.
 2. A monthly average of approximately 21 nursing man-hours were saved following the implementation of the Autonomous Scope Delivery Robot.
 3. Average NPS increased by 47%, from an average score of 35.3 (Jun–Dec 2023) to 51.9 (Jun–Dec 2024).

7. LESSONS LEARNT

1. **Stakeholder Engagement:** Involving staff from multidisciplinary teams early on facilitated smoother adoption of changes.
2. **Phased Rollout:** Incremental implementation minimized disruptions to patient care.
3. **Technology Integration:** Regular and early training programs were crucial for successful integration of new technologies.

