Streamline the Workflow for Emergency Cardiac Chest Pain Patients to Provide Timelier Assessments

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BACKGROUND

The proportion of patients presented with chest pain was the top diagnosis at Accidental and Emergency (A & E) department. Disposition of these patients in Extended Diagnostic Treatment Unit (EDTU) and General Wards per month was 101 and 80 respectively. The average length of stay (ALOS) in EDTU as 24 hours at 95th percentile and 19.3 hours at 50th percentile. The ALOS in General Wards as 6.6 days at 95th percentile and 2.8 days at 50th percentile.

ECG and blood tests were administered on patients during their stay in EDTU, if non-diagnostic, it does not serve as sufficient discriminators for optimal decision making for A & E Physicians. Thus it is important to improve the ability to triage patients with acute coronary syndrome (ACS) more rapidly and accurately for optimal management of patients in A & E. The Value Stream Map for chest pain patients admitted to A & E before the improvement was as follow:

Figure 1
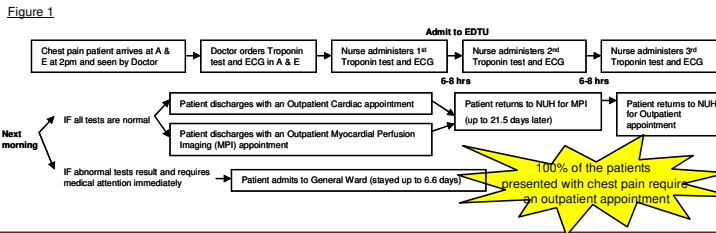
OBJECTIVES

1. Streamline the workflow for emergency Cardiac patients to provide timelier and adequate assessments to reduce avoidable admissions and length of stay for Cardiac chest pain patients.
2. Ensure that patients receive evidence-based care by initiating MPI tests early in EMD

METHODOLOGY

The approaches which were adopted to streamline the workflow for emergency Cardiac patients were as follows:

Go and See sessions in A & E, EDTU, Nuclear Lab and Diagnostic Cardiac Lab were organized to bring the team down to the front line to capture wastes in the process and observe patients' experience.

Value Stream Mapping was used to analyze the current state and designing a future state for better flow across multiple processes

Paradigm breaking exercise helped the team to think out of the box and come up with breakthrough solutions.

Principles in **Cell Concept** guided the team during solutioning. The team took references from the best practises from other countries and developed new workflows.

Rapid Experiments were conducted to quickly test the viability of the ideas in the real environment and generate new insights.

IMPLEMENTATION

1. Patients received a more conclusive clinical diagnosis of their heart condition as MPI was administered within 24 hours from the day patient was admitted with atypical chest pain at A & E.
2. Inclusion and exclusion criteria guides for the management of chest pain patients for A & E Doctors were created (Figure 2) to ensure a smoother workflow at A & E.
3. Radiographers created additional resource for A & E referrals and were able to perform MPI within 24 hours from the time patient was admitted (Figure 3 & 4).
4. Developed a more well coordinated and seamless workflow between A & E and Nuclear Laboratory on the management of chest pain patients. There was better patient experience as it reduced anxiety as a result of earlier MPI.
5. Overall, the improved workflow **reduces admission to the Ward, reduces re-admission to A & E, reduces number of Clinic visits, promote safe discharges and cost reduction to patients.**

Figure 2: Inclusion and exclusion criteria for EMD Doctors
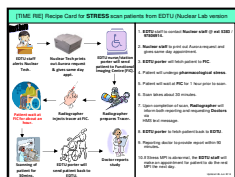Figure 3: Recipe Card for Acute Rest MPI
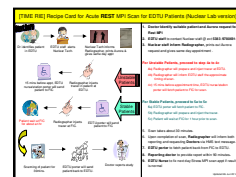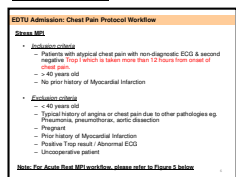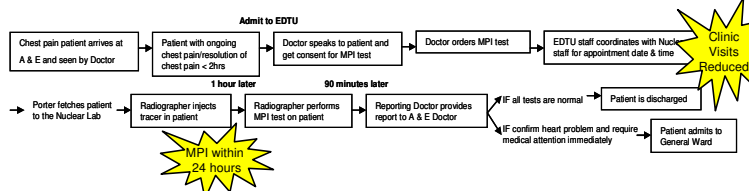Figure 4: Recipe Card for Stress MPI

Figure 5: Overall Workflow for Patients with Ongoing Chest Pain / Resolution of Chest Pain within 2hrs

RESULTS

The team achieved results which were beyond expectation.
1. Appointment wait time for Myocardial Perfusion Imaging (MPI) (Figure 6)
   - At 95th percentile: Reduced from **21.5 days to 1.2 day** (target 14 days)
   - At 50th percentile: Reduced from **11 days to 1 day** (target 5 days)

2. Before the project, all chest pain patients who were discharged from A & E would be given a Cardiac outpatient appointment. After the project, 75% were able to be discharged without the need for a Cardiac outpatient appointment. The team managed to **save 70 outpatient cardiac appointments** over 12 months (Figure 7).
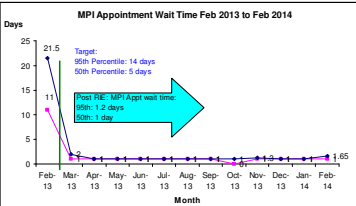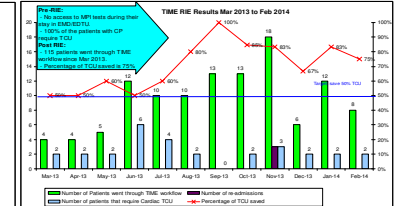
Figure 6: MPI Appointment Wait Time
Figure 7: Overall RIE Result Mar 2013 to Feb 2014

SUSTAINING THE GAINS & LESSONS LEARNT

Sustainability
- The team conducted regular review meetings for 12 months to follow-up on the progress, challenges, and review results.
- All key stakeholders were engaged during the meeting to provide feedback on a regular basis.
- Concerns and challenges faced were addressed promptly.

Key Success Factors
- Team leaders' constant updates to their respective Head of Department in A & E and Cardiac Department provided good support and assurance to the team's progress.
- The team was very clear that the solutions were patient centric and they all worked cohesively towards a common goal.
- Effective use of continuous improvement methodology.