Project Title

Significant Process Improvement After Implementation of Point of Care Testing of Creatinine in Radiology

Project Lead and Members

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Project members: Shiny Jilse Lim Sian Foong, Glenise Ho, David Tan

Organisation(s) Involved

Ng Teng Fong General Hospital

Healthcare Family Group(s) Involved in this Project

Allied Health, Nursing

Applicable Specialty or Discipline

Medical & Laboratory Technology, Radiology

Project Period

Start date: Nov 2018

Completed date: Jul 2019

Aims

To reduce wait time from 2.1 hours to 1 hour for outpatients who arrive for CT/MRI scan without serum creatinine/eGFR results by July 2019.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

POCT creatinine project has improved workflow for CT/MRI scans by reducing the work load of nurses/PSAs, minimise inconvenience of patient and improve on the patient satisfaction.

Conclusion

See poster appended/ below

Project Category

Care & Process Redesign, Quality Improvement, Lean Methodology

Keywords

Point of Care Testing, Creatinine

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SIGNIFICANT PROCESS IMPROVEMENT AFTER IMPLEMENTATION OF POINT OF CARE TESTING OF CREATININE IN RADIOLOGY

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- ☐ SAFETY
- ☑ PRODUCTIVITY
- ☑ PATIENT EXPERIENCE
- ☐ QUALITY
- ☑ VALUE

Define Problem/Set Aim

Opportunity for Improvement:

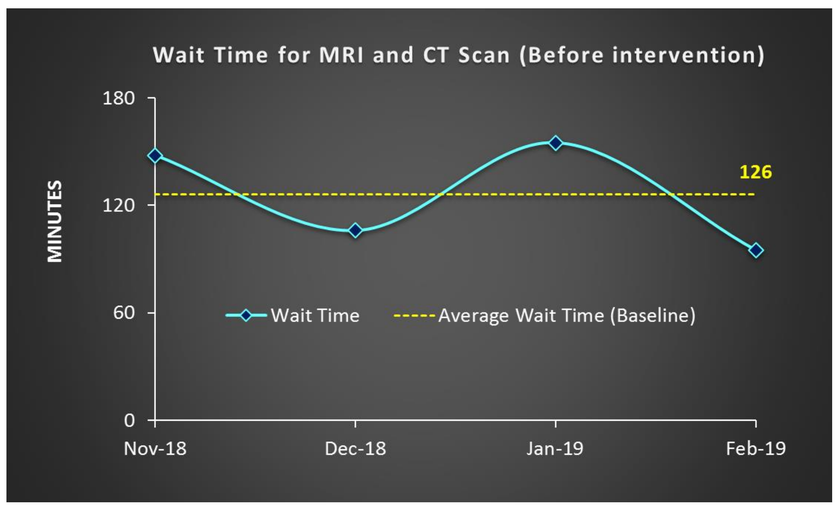
Outpatients who are at risk of contrast-induced acute kidney injury and nephrogenic systemic fibrosis must have their renal function assessed at least 30 days prior to Computed Tomography Scan (CT) and six months prior to Magnetic Resonance Imaging (MRI). Our data from November 2018 to February 2019 showed patients who present for CT/MRI scan without recent renal function assessment often have to wait for an average of 126 minutes (2.1 hours) for the relevant lab test result to be available for their CT or MRI scans.

Aim:

To reduce wait time from 2.1 hours to 1 hour for outpatients who arrive for CT/MRI scan without serum creatinine/eGFR results by July 2019.

Establish Measures

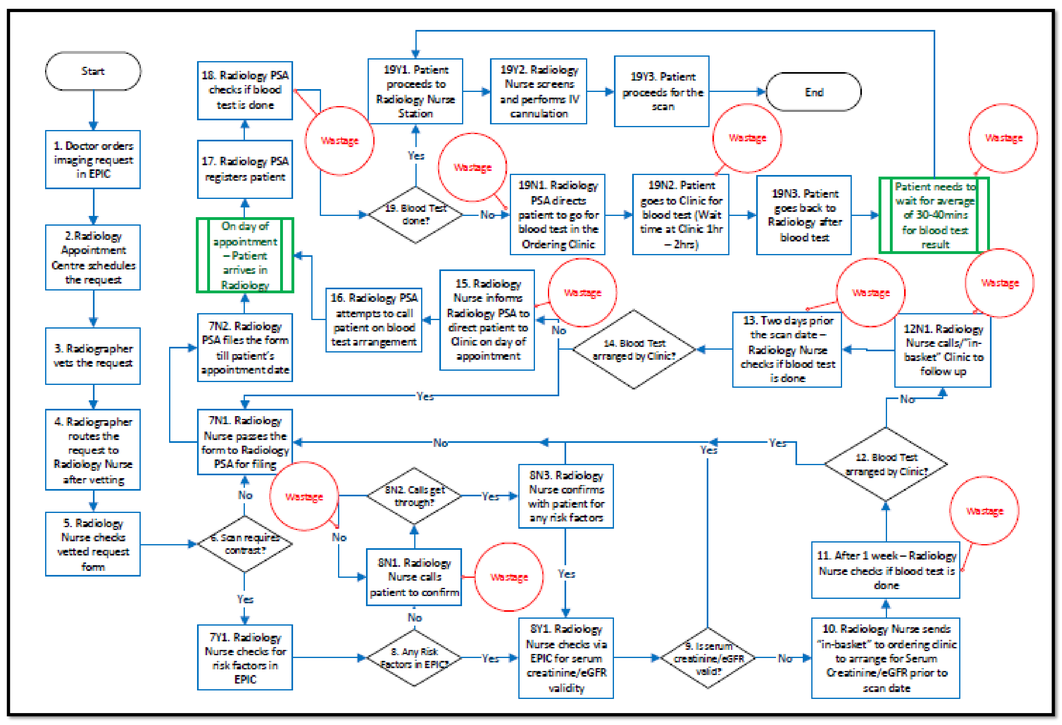
The team from Radiology & Laboratory used four months data from EPIC (Electronic Medical Record) to establish the baseline. Result shown that the average wait time prior to the intervention was 126 minutes (2.1 hours).



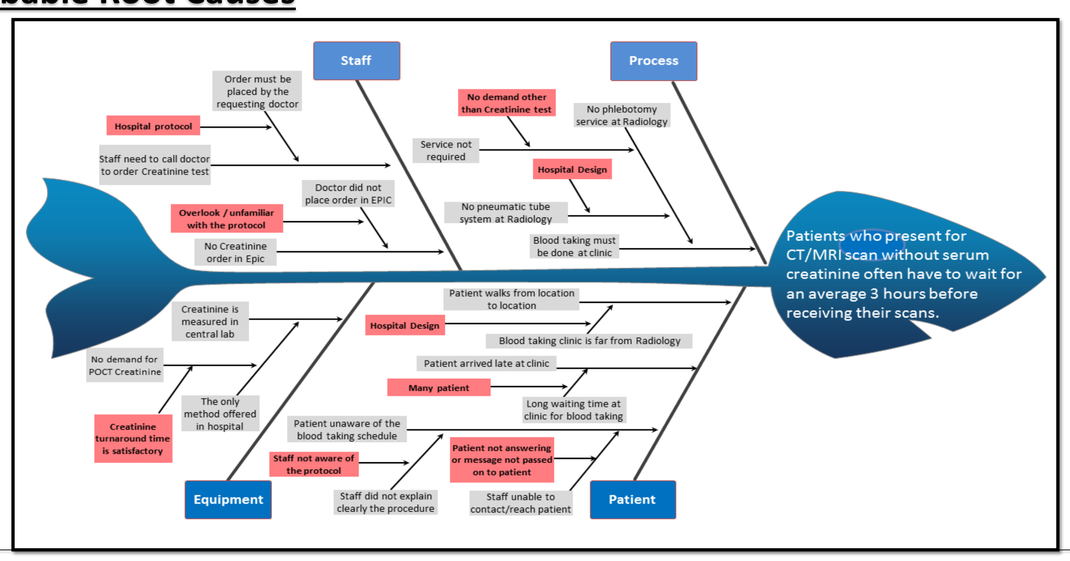
Analyse Problem

Radiology mapped out the current process and constructed a fishbone diagram to analyse the problem.

Current Process:



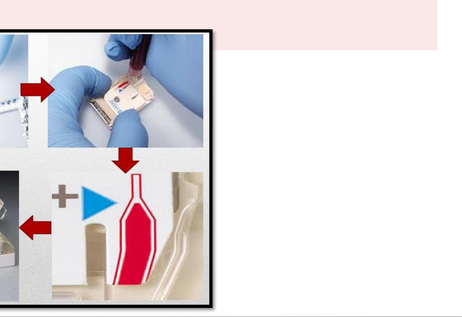
Probable Root Causes



Select Changes

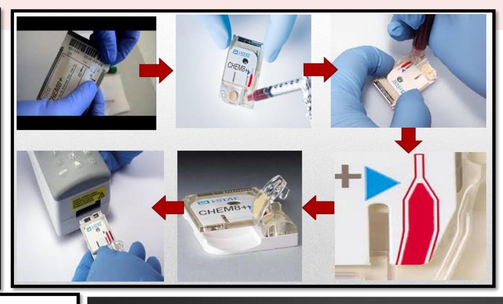
What are the probable solutions?

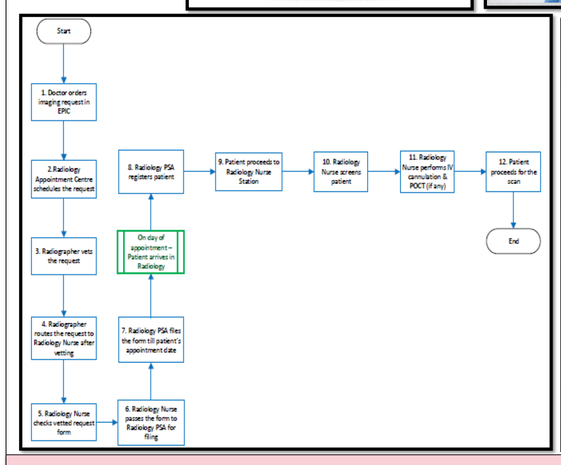
Root Cause	Potential Solutions
Bedside creatinine testing is not available.	1. Explore POCT Creatinine at Outpatient Radiology 2. POCT machine is available in Emergency Department for use during Mass Casualty Incidence. Explore possibility to share resources.
Onsite phlebotomy service is not available.	2. Explore having phlebotomy service at Outpatient Radiology 3. Explore building a pneumatic tube line to Outpatient Radiology
Laboratory test must be placed by requesting/ attending doctors.	4. Explore hospital policy to grant ordering right to Radiology nurses
Blood taking clinic is far from Outpatient Radiology	5. Explore alternate clinics that has phlebotomy service and near to Outpatient Radiology
Blood taking clinic is busy with patient	5. Explore alternate clinics that has phlebotomy service and less crowded

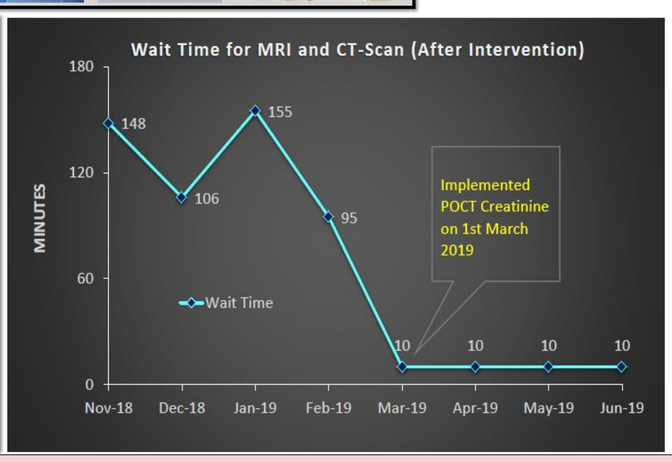


Test & Implement Changes

CYCLE	1
PLAN	To implement POCT Creatinine at Outpatient Radiology for patients who are at risk for contrast induced acute kidney injury and nephrogenic systemic fibrosis from 1st March 2019.
DO	Tapped on POCT machines from Emergency Department to implement the POCT Creatinine project. Implemented POCT Creatinine as planned from 1st March 2019. Received positive feedback from both staff and patients.
STUDY	The first 3 months' post-implementation results (1st March 2019 to 30th June 2019) show remarkable reduction in wait time from average 2 hours (pre-intervention) to 10 minutes (post-implementation). The new workflow was simplified from 22 steps to 12 steps.
ACT	The implementation is successful. To proof this result is consistent overtime, the team will monitor the performance of the 1st intervention for another 6 months before revisit/consider other potential interventions.







Spread Change/ Learning Points

Spread of Change

The changes were communicated to:

- Service Operation leaders, SOCs and JMC nurse leaders through emails
- SOC nurses through in-service dialogue

Learning Points/ Benefits of this implementation

Patients:

Patient	Before implementation	After implementation
Total time in hospital	Longer (3to 4 hours for 15 – 60 minutes scan)	Shorter (cut down 80%)
Fasting time	Extend fasting time due to several reasons	Minimized chances of extending fasting time
Injection / venepuncture	Minimum of TWO punctures (1 for Blood test; 1 for contrast injection cannulation)	Only ONE puncture (cannulation for contrast injection & POCT can be doen simultaneously)
Blood loss	Minimum of 1cc	< 1cc
Receives calls from hospital prior scan	1 or More	NA
Unnecessary blood test	Yes	Minimize

Hospital Staff:

Radiology Nurses / PSA	Before	After
Calling patient	1 or more	Not required
In-Basket message/ clinic nurse to arrange blood test	Twice or more	Not required
Follow up with clinic to arrange blood test	Required	Not required
Follow up with patient for risk factor	Required	Not required

- Prior to intervention, a full renal panel (consist of 6 tests) were ordered for ~68% patients instead of just serum Creatinine, which is the main test to determine eGFR and to assess patient's risk for contrast induced acute kidney injury and nephrogenic systemic fibrosis. With POCT Creatinine, patient is not subjected to unnecessary blood tests and that gives a savings of SGD19.70 per patient.

- POCT creatinine project had improve workflow for CT / MRI scan by reducing the work load of nurses/PSAs, minimize inconvenience of patient and improve on the patient satisfactory.

Ng Teng Fong General Hospital
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Members of the NUHS