Project Title

To reduce Radiology 'time to scan' without buying more machines

Project Lead and Members

Project Lead: Dr Magaret Lee Yee Wah

Project Members: Sefanie Yick Shun Chan, Dr Steven Wong Bak Siew

Organisation(s) Involved

Sengkang General Hospital

Healthcare Family Group(s) Involved in this Project

Healthcare Administration, Medical

Applicable Specialty or Discipline

Radiology

Project Period

Start date: Jan 2020

Completed date: Jul 2021

Aims

To develop an efficient way to triage the outpatient MRI scan requests to ensure patients can obtain MRI appointment on a timely basis to ensure patient safety

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

Communication is the key to success. Listening to the stakeholders and effectively communicating that the issue is understood and offering a solution to address the issue from the stakeholder's perspective is important. The stakeholders who provide feedback (good or bad) are only going to make your work quality better.

Conclusion

See poster appended/ below

Additional Information

The project has been adopted since Jan 2020 in SengKang General Hospital. It was scaled up to SingHealth cluster wide implementation on 15 July 2022 in SGH, CGH, SKH, KKH, NHCS, NCCS.

The results of the initial project were presented to SKH Medical board in Q4 2021. The plan was originally for SKH hospital wide IT infrastructure change.

This project was then shared with cluster Radiological Science Singhealth (RSS), involved in organising Radiology into a shared service at cluster level. RSS then received Cluster Group level support on this initiative for cluster wide implementation. Cluster Radiology Heads of department, Group CMIO, Radiographers, scheduling staff cluster wide, RIS PACS workgroup were extensively engaged and consulted. Cluster wide training for Specialist Outpatient Clinics (SOC) and hospital operations teams were completed. Training slides (on PowerpointTM) documenting the changes were disseminated to all doctors on day of implementation.

The end users of this implementation include Radiographers, Radiology scheduling staff, SOC operational personnel, nursing and doctors cluster wide.

The change management strategy involves presenting the solution at multiple platforms and at each platform, the information on the PowerpointTM presentation were presented from the angle that addresses the issues the audience face. A detailed explanation of its intent and discussion on any changes to existing workflow was discussed. Training slides were provided to SOC and doctors prior to implementation.

Project Category

Care & Process Redesign, Value Based Care, Patient Satisfaction, Operational Management, Resource Allocation, Productivity, Access to Care, Waiting Time, Quality Improvement, Workflow Redesign

Keywords

Radiology, MRI Scan, Preferred Imaging Date, Triage, Time to Scan, Department of Radiology (DoR)

Name and Email of Project Contact Person(s)

Name: Dr Margaret Lee Yee Wah

Email: Margaret.lee.y.w@singhealth.com.sg

Can SKH Department of Radiology reduce MRI outpatient 'time to scan' without buying more machines?

Dr Lee Yee Wah Margaret, Dr Stefanie Yick Shun Chan, Dr Steven Wong, Department of Radiology, SengKang General Hospital

Background

Magnetic Resonance Imaging (MRI) is an important tool for diagnostic work up. SKH opened in Aug 2018 with 260 beds and limited outpatient services. The Department of Radiology (DoR) was equipped with 2 MRI scanners initially. As the hospital gradually ramped up to the planned 1000 acute beds and incorporated an increased and comprehensive range of medical specialties, MRI scan requests increased inevitably. MRI slots per day are finite. It is important that patients are scanned in a timely manner in order to start appropriate treatment early. This is known as the 'time to scan' and as with Radiological radiation principles, should be as low as reasonably possible.

As SKH opens to full capacity, the demand for outpatient MRI scans will quickly exceed supply sooner than new MRI scanners can be installed.

Therefore, SKH DoR looked to develop an efficient way to triage the outpatient MRI scan requests to ensure patients can obtain MRI appointments on a timely basis to ensure patient safety.

Current State

To request for an outpatient MRI scan, our clinicians will provide clinical indication and specify the priority of the scan. Typically, the clinical indication allows DoR to protocol the scan in order to answer the clinical question. The priority of scan will indicate how urgently the scan is required. The categories are:

P1-Stat
P2-Urgent
P3-Early
P4-Routine
P5-Before next visit

However, there are variabilities in the definition of these priorities. For example, a scan indicated as P4 may require the scan be done anywhere from within 1 month to 1 year. This results in a resource mismatch such that some urgent scans may not be scheduled within the clinician's or patient's expectation.

Root Cause Analysis

Fishbone diagram was used in our root cause analysis.

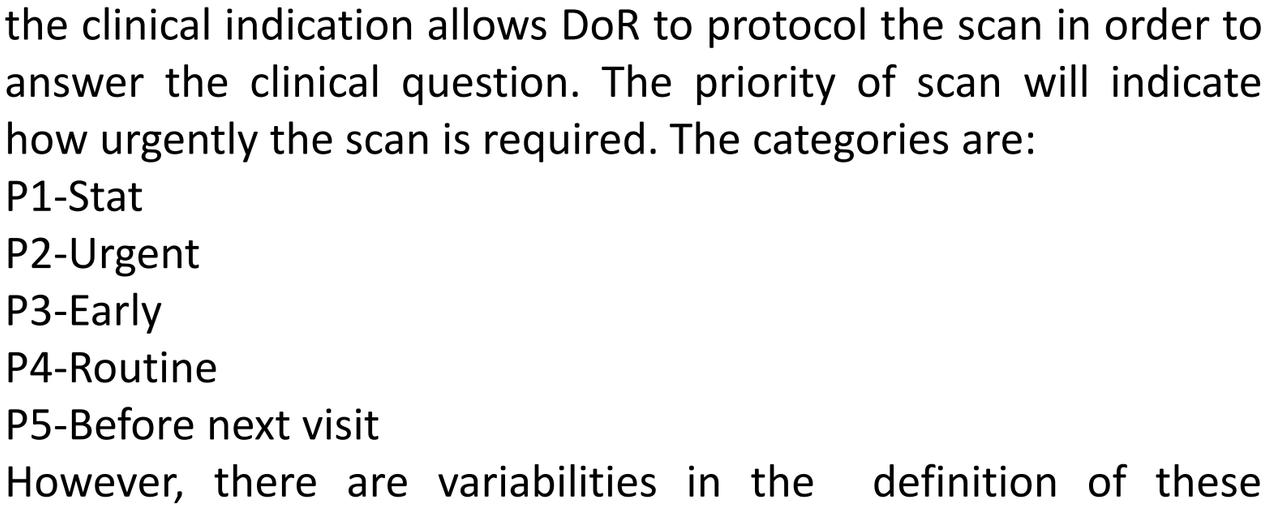

Fig. 1

Goals / Targets

The primary aim of this project is to encourage clinicians to specify a '*preferred imaging date*' when they request for scans. This translates to a target date for DoR staff. The commitment is for DoR is to allocate scan appointments within the same week of '*preferred imaging date*'.

Interventions / Initiatives

Starting from January 2020, all clinicians were given a deck of information slides from DoR. Emphasis was made on the indication of '*preferred imaging date*' on the request form. Clinicians were informed that DoR will aim to allocate scan appointments within the same week of *'preferred imaging date'*.

Implementation Plan

The introductory slides were distributed online via the SingHealth elearning platform for all incoming clinicians before starting their rotation in SKH.

Results / Follow up

As current IT infrastructure does not make *preferred imaging date* field mandatory, only 12% of clinicians provided *preferred imaging date* from January 2020 to July 2021.

Definition of 'time to scan' (TTS):

TTS = Scan completed date – *preferred imaging date*

With preferred imaging date

Average (Jan-Dec 2020): 8.5 days
Average (Jan-Jul 2021): 18.1 days

Percentile	Jan-Dec 2020	Jan-Jul 2021
25th	-10 days	-7 days
50th	0 days	3 days
75th	16 days	36 days
95th	64 days	104 days

TTS = Scan completed date – date the request was made

With no indication

Average (Jan-Dec 2020): 40.8 days
Average (Jan-Jul 2021): 69.2 days

Percentile	Jan-Dec 2020	Jan-Jul 2021
25th	15 days	35 days
50th	42 days	84 days
75th	59 days	102 days
95th	90 days	149 days

Fig 2. Average 'time to scan' with and without preferred imaging date

Average 'time to scan' is lower for scan requests with *preferred imaging date* (Fig. 2).

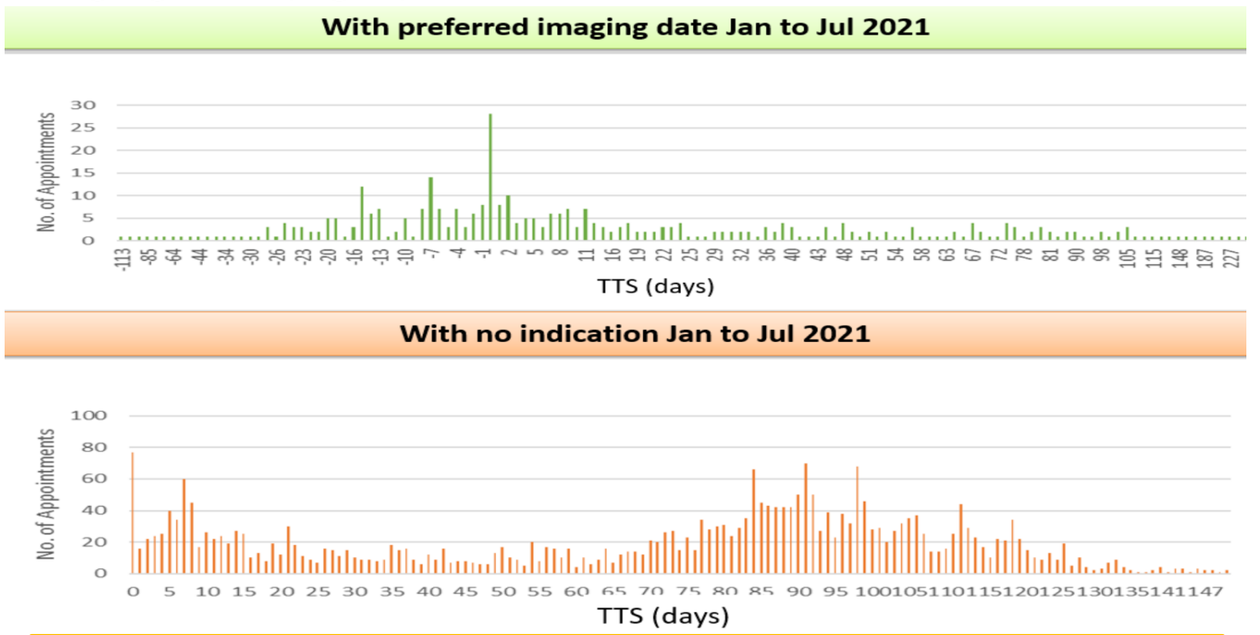

Fig 3. Distribution of TTS with and without preferred imaging date

Distribution of 'time to scan' is narrower and centered around 0 days for scan requests with '*preferred imaging date*'.

CONCLUSION

With '*preferred imaging date*', Radiology was able to add value by delivering a shorter 'time to scan' without buying more machines. This study resulted in hospital wide implementation of mandatory provision of '*preferred imaging date*' and similar efforts in Radiology Departments cluster wide.

References

1. Radiology in the era of value-based healthcare: a multi-society expert statement from the ACR, CAR, ESR, IS3R, RANZCR, and RSNA. Brady et al. Insights Imaging (2020) 11:136
2. Strategies for Radiology to Thrive in the Value Era. Jonathan B. Kruskal et al. Radiology 2018; 289:3–7