

Can SKH DoR reduce MRI outpatient wait times without buying more machines?



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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. potentially compromising patient safety.

Root Cause Analysis

Fishbone diagram was used in our root cause analysis.

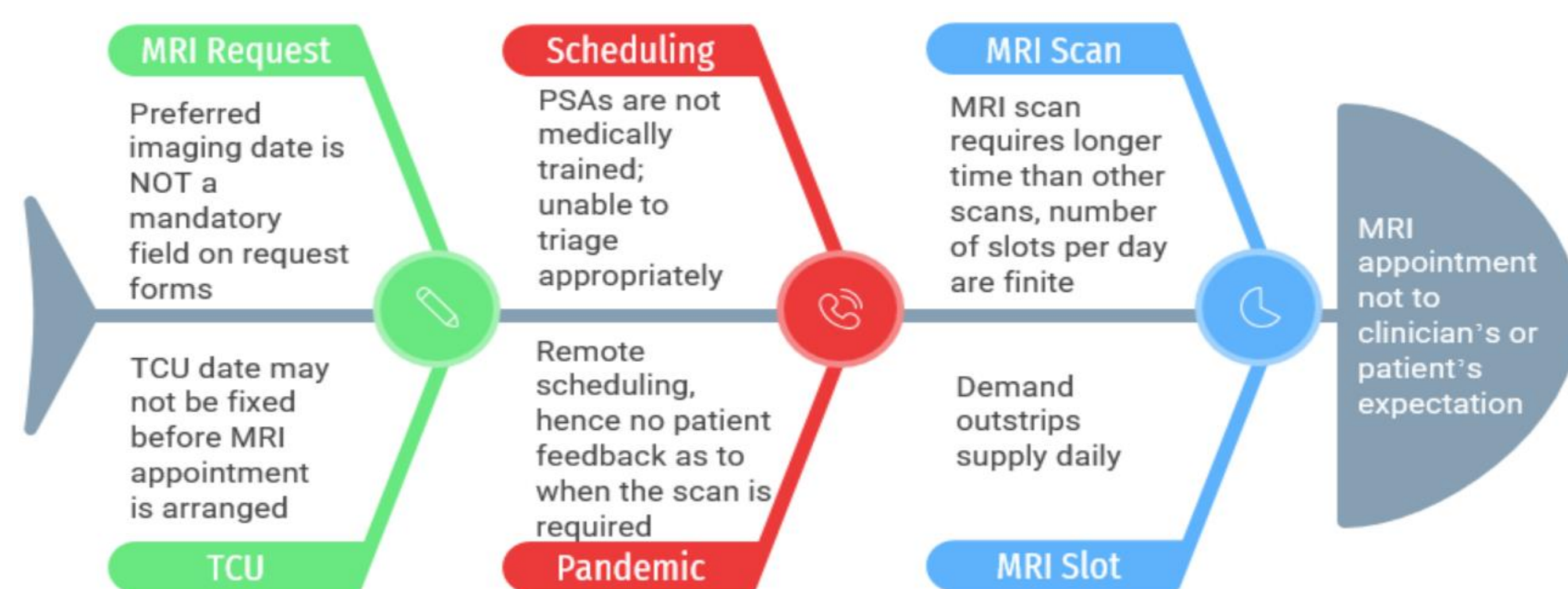


Fig. 1 Fishbone diagram for root cause analysis

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 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

The original 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

TTS = Scan completed date – date the request was made

With preferred imaging date			With no indication		
Average (Jan-Dec 2020): 8.5 days Average (Jan-Jul 2021): 18.1 days			Average (Jan-Dec 2020): 40.8 days Average (Jan-Jul 2021): 69.2 days		
Percentile	Jan-Dec 2020	Jan-Jul 2021	Percentile	Jan-Dec 2020	Jan-Jul 2021
25 th	-10 days	-7 days	25 th	15 days	35 days
50 th	0 days	3 days	50 th	42 days	84 days
75 th	16 days	36 days	75 th	59 days	102 days
95 th	64 days	104 days	95 th	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).

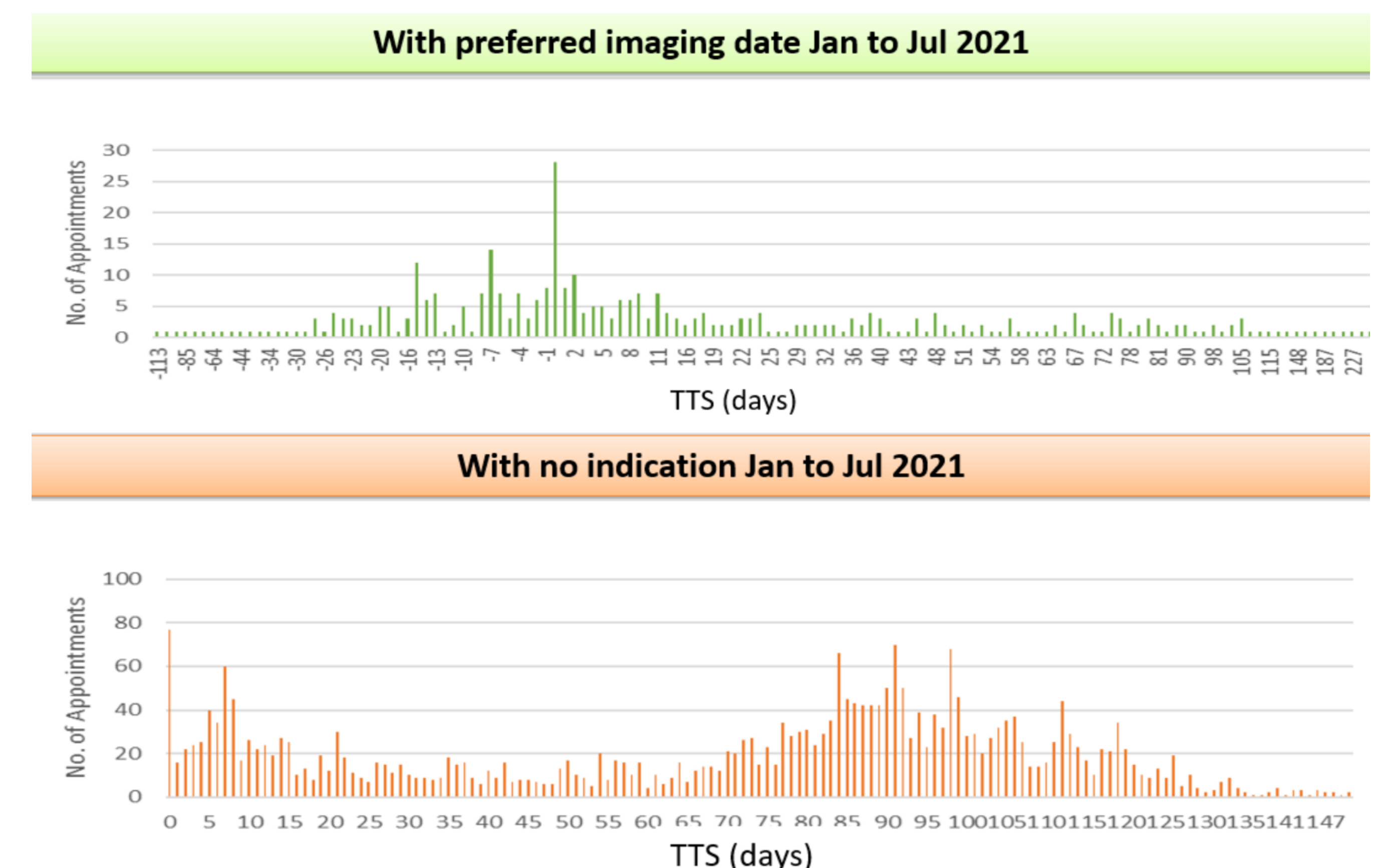


Fig 3. Distribution of TTS with and without preferred imaging date

Distribution of 'time to scan' is narrower and centered around 0 days for scan requests with 'preferred imaging date' (Fig. 3).

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

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2. Strategies for Radiology to Thrive in the Value Era. Jonathan B. Kruskal et al. Radiology 2018; 289:3-7