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Solving the Logistical Issues of Rapid MSK MR Scanning

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Outline

- What is Rapid MSK MRI?
- Adjusting the MRI Schedule
- Results
- Key Points and Summary

Rapid MSK MRI

- Parallel MR sequences with specialized multichannel coils¹
 - Requires less phase encoding with minimal losses of signal to noise ratio
 - Coils do not accommodate very large patients or patients with significant deformity
- Reduces image scan time from 15-20 minutes to 5-8 minutes
 - Still need roughly 10-15 minutes of patient preparation time

1. Subhas N, Benedick A, Obuchowski NA, Polster JM, Beltran LS, Schils J, Ciavarra GA, Gyftopoulos S. Comparison of a Fast 5-Minute Shoulder MRI Protocol With a Standard Shoulder MRI Protocol: A Multiinstitutional Multireader Study. *AJR Am J Roentgenol.* 2017 Apr;208(4):W146-W154.



Rapid MSK MRI Image



Non-Rapid MSK MRI Image

Adjusting the MRI Schedule

- MRI schedule was changed from 45 minute blocks to 30 minute blocks.

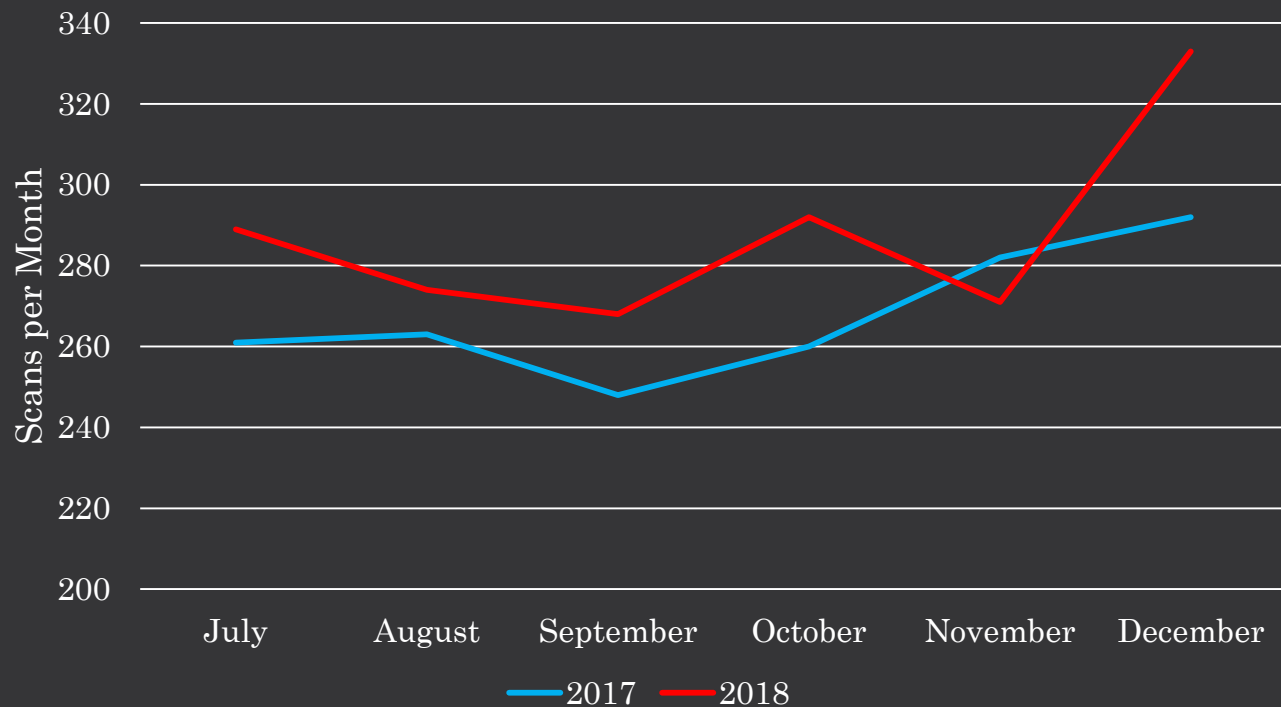
Number of MR Protocols Adjusted	
45 minutes to 30 minutes	51
90 minutes to 60 minutes	19
135 minutes to 90 minutes	4
45 minutes to 60 minutes	30

Methods / Results

- Volume, lead time, and technologist feedback from July-December 2017 and 2018
- Busiest/most consistent MR scanner
 - Obtain consistency for technologists and scheduling

MR Scan Volume

Monthly MR Volume



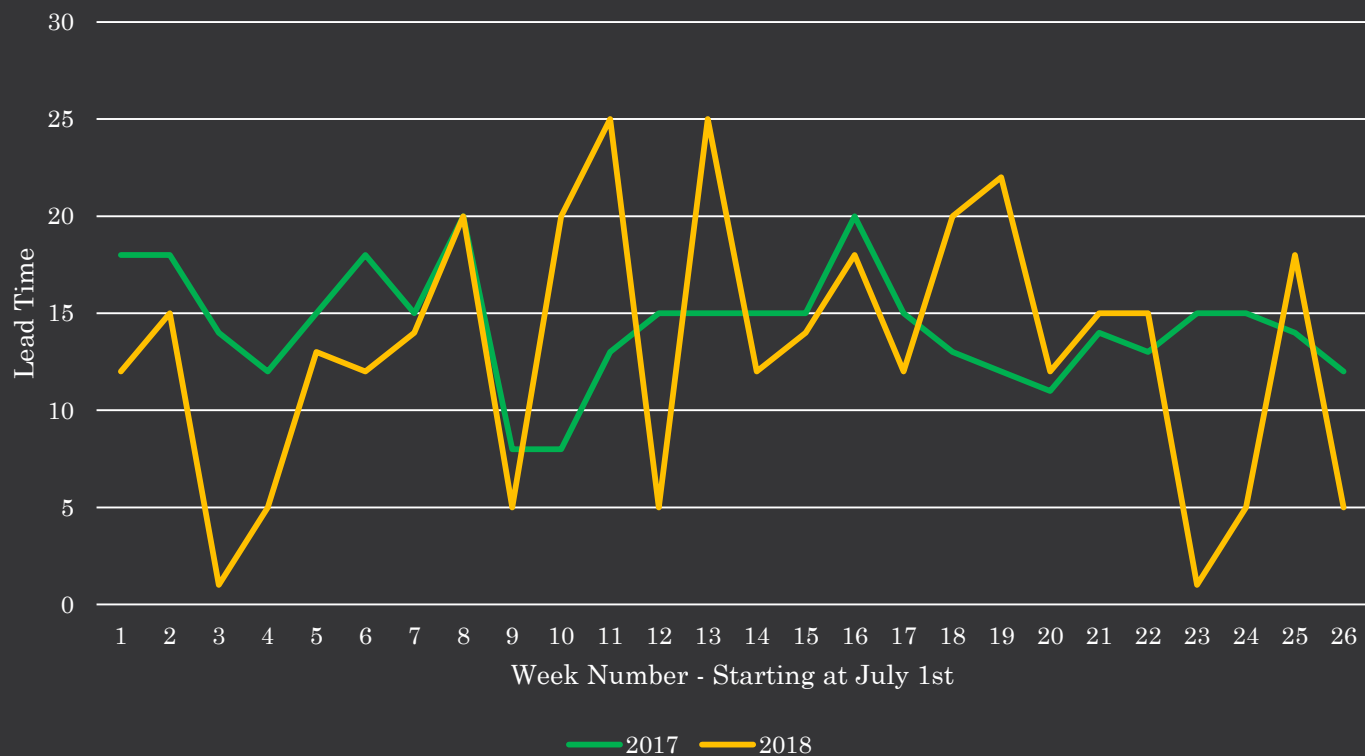
Mean Monthly MR Scan Volume (Single Scanner)

July-December 2017 268 scans

July-December 2018 288 scans
($p < 0.05$)

Scheduling Lead Time

Mean Weekly Lead Time



Mean Weekly Lead Time
(Single Scanner)

July-December 2017	14.3 days
July-December 2018	13.1 days



Technologist Feedback

- Creates a more 'CT' like pace
 - Requires more coordination between the technologist team
- Patients who are very slow (ex. changing clothes) can feel rushed
- Requires more awareness to avoid delays
 - Radiographs needed for potential metal
 - Patients incompatible with Rapid MSK coils

Summary and Key Points

- Rapid MSK imaging techniques allow us to perform MSK MR exams in 30 minutes
- Adjusting the MR schedule from 45 minute blocks to 30 minute blocks increased overall MR scan volume and reduced lead time
 - Patients can get their scans more quickly and with more scheduling flexibility