

# REDUCTION OF OUTPATIENT MAGNETIC RESONANCE IMAGING (MRI) WAIT-TIMES AT A HOSPITAL SETTING

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## TEAM

### Radiologists:

A. Gentili M.D.  
N. Vahdat M.D.  
S. Ramadan M.D. (CRQS)  
S. Ashfaq M.D. (Research fellow)  
A. Khurana M.D. (Resident)

### Technologist :

Michelle Menogue BS, RT

### Healthcare systems specialist:

Charlene Godbold

### Medical support Assistant:

Teresa Forest

### System Redesign

Eusebio Rodriguez MBA  
Tomika Johnson

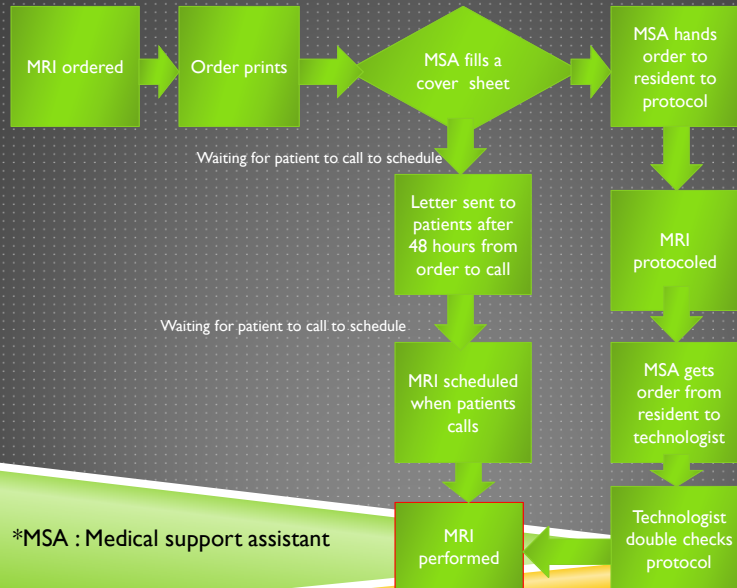
## AIM

To accommodate 90% of outpatient MRI studies within 30 days of the desired date as entered by the clinical providers in order to improve timely access to medical care and to be compatible with the goal of the Veterans Health Administration

## TEAM

Long average wait time for obtaining outpatient MR Imaging studies at our hospital based Radiology department was addressed by assembling a multidisciplinary team in order to reduce the wait time through maximizing resources, waste elimination and process redesign

## CURRENT STATE



## METHODS

- ▶ Multiple Plan Do Study Act (PDSA) cycles were performed
- ▶ This 9 months project started in August 2014 and ended in April 2015
- ▶ It was initiated by data collection regarding the appropriateness of MRI studies based on McKesson Interqual criteria & American College of Radiology (ACR) appropriateness criteria

[www.acr.org](http://www.acr.org)  
[www.mckesson.com](http://www.mckesson.com)

## METHODS

A Rapid process improvement workshop (RPIW) was conducted which included several core Radiology service stakeholders:

- ▶ Radiology Administrative director
- ▶ Medical support assistants (MSAs) representative
- ▶ MRI chief technologist
- ▶ Radiology Service Chief
- ▶ Clinical informatics Research fellow
- ▶ Chief Resident for quality and patient safety

Subsequent meetings and cooperation took place with the Chief of Primary care service, transport staff and Radiology Residents to ensure multi-source feedback with a patient centric approach

## METHODS

Retrospective data was collected for annual MRI studies performed; including review of average wait time and the most frequently requested MRI studies. Based on these metrics, the conceived process improvement strategies were implemented while noting subsequent effects on specific metrics

## OUTCOME MEASURES

### Average wait time

- Average wait time from desired date as entered by the clinical provider until the MRI study was performed

### Percentage of patients getting MRI study performed in less than 30 days

- Percentage of patients getting MRI studies performed in less than 30 days from the desired date as entered by the clinical provider per month

## PROCESS MEASURE AND BALANCING MEASURE

### Process measure

- The number of MRI studies performed per month

### Balancing measure

- Radiology technologists' satisfaction survey was conducted before and after implementing changes and considered a balancing measure

## INTERVENTIONS

### Maximizing resources

- Maximizing resources was achieved by adding 8 AM to 4 PM slots on Sunday for one of the two available MRI machines

## INTERVENTIONS

### MORE EFFICIENT MRI TECHNOLOGISTS' WEEKDAY SHIFTS

Prior to October 2014:  
Weekdays: 6AM- 2:30 & 11:00-8:30PM  
Weekends:  
GE: Sat 8-2/2-4 Inpt & ED  
Sun: 8-2/2-4 Inpt & ED  
Siemens: Sat 8-4 Research

From Oct 14-Feb 15  
Weekdays: 6AM- 2:30 & 11:00-8:30PM  
Weekends:  
GE: Sat 8-2/2-4 Inpt & ED  
Sun: 8-2/2-4 Inpt & ED  
Siemens: Sat 8-4 Research  
Sun: 8-2/2-4 Inpt & ED

After Feb 2015 Schedule:  
Weekdays:  
6 AM-2:30 PM & 2PM-10:30PM  
Weekends:  
same as before



## METHODS

- ▶ Other attempted interventions included furnishing multidisciplinary Care coordination agreements for lumbar spine and knee MRI studies in order to reduce unnecessary MRI requests regarding these frequently requested studies. A Radiology resident was involved in furnishing these agreements as part of his quality improvement training during Radiology residency
- ▶ Ongoing efforts to implement an effective electronic protocoling system are currently underway

## RESULTS

The number of requested MRI studies at the Hospital increased from 10,392 MRI studies in fiscal year 2012 to 11,880 MRI studies in fiscal year 2014; a 14.3% increase while still utilizing the same two MRI machines

## RESULTS

- ▶ The average patient wait time for scheduling an MRI was reduced from 22 days to 15 days; a 31.8% reduction
- ▶ The percentage of patients getting MRI studies performed in less than 30 days from the desired date has increased from 71% to 93.4%; a 22.4% increase

## SURVEY RESULTS

### Before schedule change:

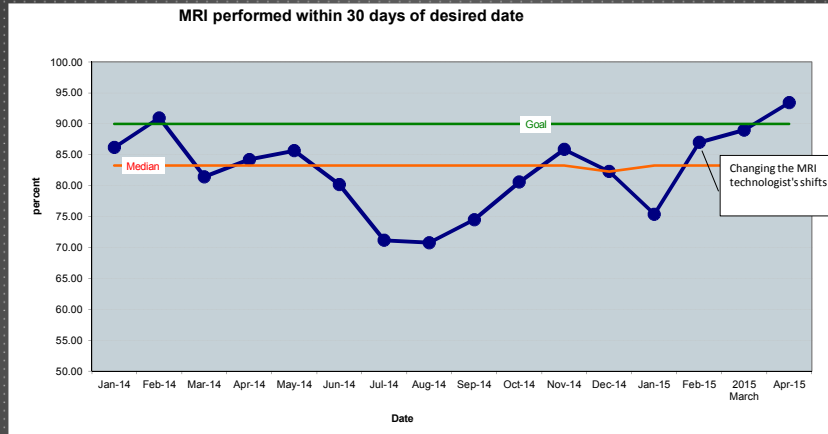
- ▶ 25% of MR Technologists answered "Somewhat satisfied" *with work schedule*
- ▶ 75% did not respond

### After schedule change:

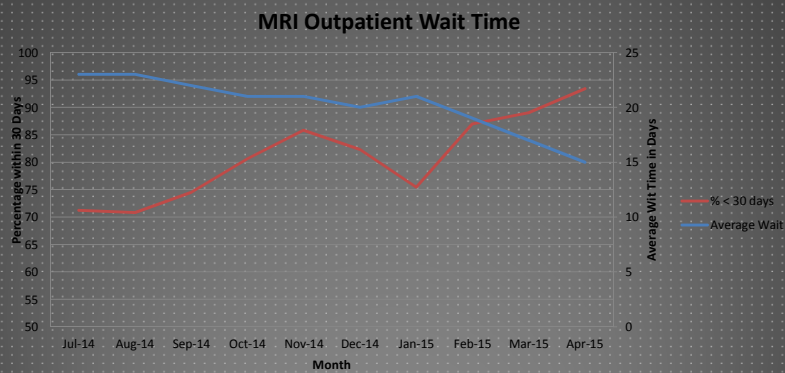
25% answered "Very satisfied"  
25% answered "Somewhat satisfied"  
50% answered "Not satisfied"



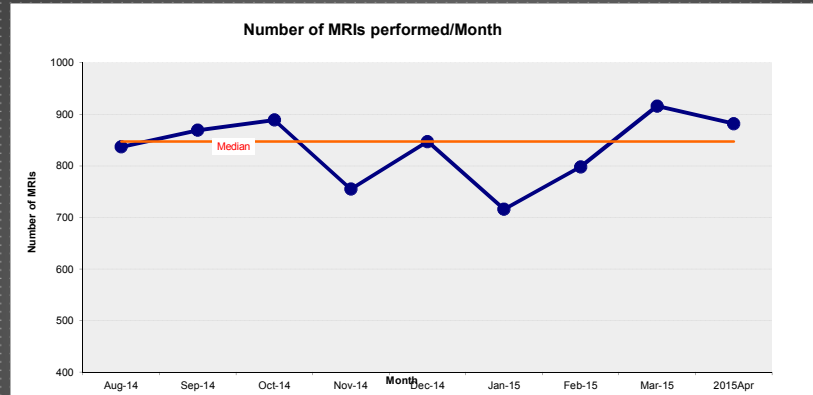
# MRI WAIT TIMES



# MRI WAIT TIMES



## NUMBER OF MRI STUDIES PERFORMED/MONTH



## KEY AREAS REQUIRING INTERVENTION

- ▶ Ensuring appropriateness of MR exam request
- ▶ Partially paper based workflow for MR protocoling and scheduling
- ▶ Shortage of MSAs and MRI technologists

## CONCLUSION

Patient wait time for MRI availability at our Hospital decreased using a systematic approach towards work process analysis, planning, implementing small changes and eliminating waste of vacant MRI appointment slots

## CONCLUSION

Long term measures to improve efficiency include:

- ▶ Converting to an effective electronic protocoling system
- ▶ Implementing Care coordination agreements in order to ensure appropriateness of studies
- ▶ Oversight tools to ensure compliance as well as retaining trained support staff

# RAPTOR

## RAPTOR: Radiology Protocol Tool Recorder

- ▶ Convert paper-based work flow for advanced medical imaging (CT, MR, Nuclear Med) to an optimized web-based tool
- ▶ Leverage existing VHA Information Systems
- ▶ RAPTOR utilizes a user friendly work list that assists in multiple steps during the workflow including Protocols and Quality control

# CONCLUSION

The project highlights the value of:

- ▶ Including technologists and support staff in planning and implementing quality improvement interventions
- ▶ Utilizing the organizational resources of a local system redesign department to produce significant improvement