

Enhancing MRI Service Delivery: A Data-Driven Approach to Reducing Wait Times and Increasing Throughput

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Background/Problem Being Solved

The increased demand for MRI services has led to extended wait times exceeding multiple weeks and causing delays in patient care. There is a notable gap in the current ability to analyze MRI protocol and sequence data, hindering scheduling optimization efforts. Previous initiatives aimed to reduce the total time of MRI exams; however, a more granular examination of the data around table time of each exam was essential for further optimization. To help address this issue, we aimed to build an analytics solution to be used by our radiology team to improve MRI scheduling efficiency.

Intervention(s)

The team integrated Digital Imaging and Communications in Medicine (DICOM) data with Electronic Health Records (EHR) and Picture Archiving and Communication System (PACS) data in an interactive dashboard. The DICOM level data was matched to the PACS system data using exam name and exam begin time, which was then linked to a patient identifier within the EHR data.

Barriers/Challenges

A significant barrier to the project was determining the availability of such data and conducting manual data pulls in the face of unstandardized data reporting and formatting.

Outcome

Through this project, a dashboard was created to visualize an MRI's order entire life cycle from protocol to sequences. The dashboard was filterable by exam name and protocol selections to determine add-on sequences that lengthened scan time. The radiologist team utilized this information to observe time differences per sequence on each scanner and subsequently adjusted them to a standardized duration.

Conclusion/Statement of Impact/Lessons Learned

The data-driven approach resulted in shortened scan times without compromising academic institution quality scans. There has been a 13% average increase in throughput measured by exams per hour. In conclusion, this innovative, data-

driven intervention not only significantly enhanced MRI scheduling efficiency but also established a scalable model for optimizing radiological services in high-demand healthcare environments.

Synopsis

This submission details a data-driven approach to enhancing MRI service efficiency at an academic healthcare institution. The dashboard showcases the integration of DICOM, EHR, and PACS data to significantly reduce wait times and increase throughput.

Figure(s)

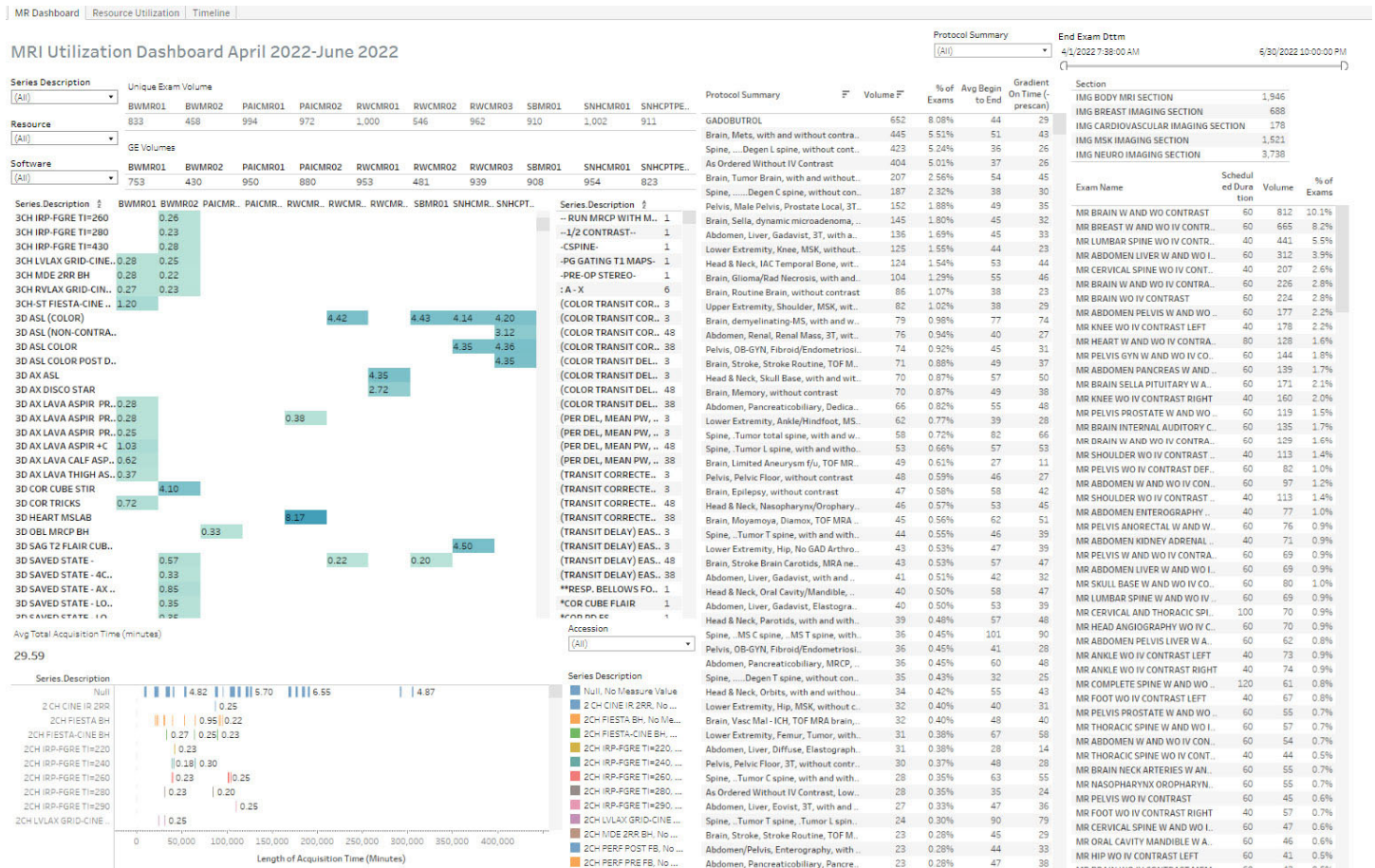
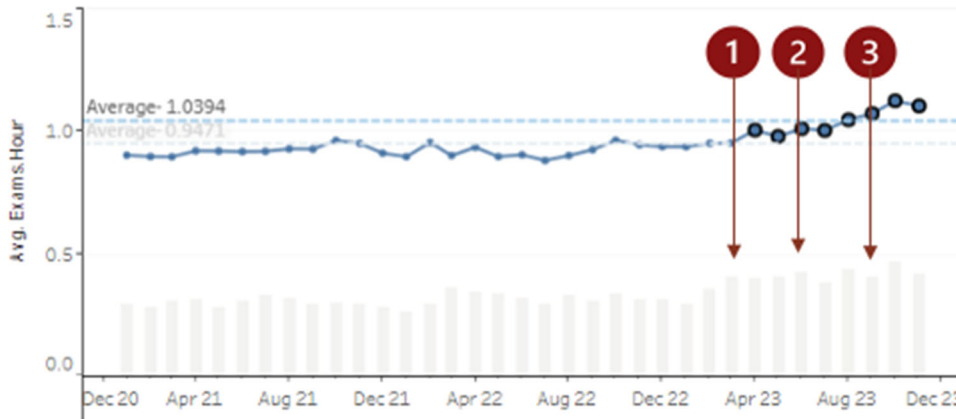


Figure 1. Dashboard created to visualize series level data by scanner and protocol summary. Dashboard can be drilled down to a specific protocol to compare different series time across scanners as shown on the left. Bottom left-hand corner displays visual timeline of series that can be drilled down to a patient level.

MR Outpatient Premier Scanners
PAICMR1, PAICMR2, RWCMR1, RWCMR2, SNHCMR1, BWMR1



13% average increase in throughput (.9198 to 1.0394 exams/hour) since April 2023

1. March 13th, 2023: First batch of exams go live in EPIC with new appointment durations
2. June 6th, 2023: Second batch of exams go live in EPIC with new appointment durations
3. September 22nd, 2023: Third batch of exams go live in EPIC with new appointment durations

Figure 2. Illustrates the positive impact of phased interventions on MRI scan efficiency, with a 13% average increase in exams per hour across outpatient scanners, following the implementation of new appointment durations.

Keywords

Administration & Operations; Patient/Family Experience; Quality Improvement & Quality Assurance