MRI Rapid Diagnostic Pilot

Why
- Increase capacity
- Improve patient experience
- Keep costs constant

Outcomes
- 40% faster scans
- Opened up 766 hours
- 2,322 more patients

Contents
- Overview
- The Pilot
  - 6 month trial
  - 1,200 scans completed
  - Stakeholder Feedback: identified delay causes, shared success strategies and process improvements
  - Auditing: Monitored exam time & risk related to new protocols, ensured quality
- The Goal
  1. Create rapid MRI exam protocols for new patient populations
  2. Expand model to other MRI departments
- Results
  - Capacity increase: opened up a potential 766 MRI hours, for an extra 2,322 rapid patients per year
  - Quality remained comparable
  - Increased workload was manageable through streamlined processes
  - Program under development to expand the MRI Rapid Diagnostic model to other MRI Centres

The Pilot
- Team: Radiologists, technologists, booking staff, administrators
- Population: Patients requiring less complex MRI scans

Setup
Pilot Design
Team assembled
A multi-disciplinary team of radiologists, technologists, booking staff, and administrators
Patient population identified & rapid protocols developed

Exclusions were made based on specific indications to manage safety and risk in each population. Examples include indications of: tumor, surgery history, trauma

Pilot Design (continued)
Defined pilot measures

<table>
<thead>
<tr>
<th>Process Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcome Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot wait times</td>
</tr>
</tbody>
</table>
Pilot Rollout

Conducted scans
• 1,200 rapid scans completed as part of the pilot

Completed audits and observations
• Ensured that exam times were within reasonable range of the 20 minute target
• Ensured that pilot data was complete, accurate, and valid
• Recorded and investigated any issues experienced in booking or performing rapid exams

Recorded issues, shared solutions
Clerical and technologist staff recorded instances of specific issues that caused delays or poor data quality. Additionally, staff gathered regularly to share progress, raise issues, and solve problems together. Progress on wait times, exam durations, and other metrics were reviewed regularly, to avoid risks to quality of care, but also to gather suggestions for improvement in each area. As expected, several metrics – including exam durations – improved over the course of the pilot thanks to this regular review.

Evaluation

Analyzed pilot measures

<table>
<thead>
<tr>
<th>Body Area</th>
<th>Rapid (mins)</th>
<th>Routine (mins)</th>
<th>Time Savings</th>
<th>Annual Demand</th>
<th>Additional Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee</td>
<td>18.98</td>
<td>32.98</td>
<td>42%</td>
<td>1620</td>
<td>1195</td>
</tr>
<tr>
<td>Shoulder</td>
<td>20.43</td>
<td>32.92</td>
<td>38%</td>
<td>657</td>
<td>402</td>
</tr>
<tr>
<td>Brain</td>
<td>19.97</td>
<td>33.42</td>
<td>40%</td>
<td>835</td>
<td>562</td>
</tr>
<tr>
<td>IAC</td>
<td>22.28</td>
<td>32.22</td>
<td>31%</td>
<td>362</td>
<td>145</td>
</tr>
<tr>
<td>Post UFE</td>
<td>24.97</td>
<td>26.30</td>
<td>5%</td>
<td>110</td>
<td>6</td>
</tr>
<tr>
<td>Fistula</td>
<td>40.77</td>
<td>44.08</td>
<td>8%</td>
<td>59</td>
<td>5</td>
</tr>
<tr>
<td>Pancreas</td>
<td>31.17</td>
<td>46.22</td>
<td>33%</td>
<td>16</td>
<td>8</td>
</tr>
</tbody>
</table>

Measured and confirmed quality
Image quality remained high: 1 of over 1,200 patients required a repeat MRI due to sub-par images. A physician-led quality assurance review of over 200 cases did not identify a single case where a peer review of the diagnosis differed from the original diagnosis. The success in diagnostic quality can be attributed to requisite diagnostic image quality produced by the new protocols.
**Evaluation (continued)**

**Staff satisfaction measured**

```
<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0%</td>
<td>9.3%</td>
<td>20.9%</td>
<td>55.4%</td>
<td>7.0%</td>
</tr>
</tbody>
</table>
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“I feel that my department worked collaboratively to solve problems during the pilot execution”

**Cost measures**

Due to capacity to scan a greater number of cases per year, cost implications of additional image storage were considered. Assessment of these costs proved them negligible. Additionally, implications of contrast medium costs due to increased cases per year was considered. Due to the small proportion of contrast cases participating in the pilot, contrast media cost was found to be low.

**Transition to Operations**

<table>
<thead>
<tr>
<th>Adopted</th>
<th>Not adopted</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Rapid Knee</td>
<td>☒ Rapid IAC</td>
</tr>
<tr>
<td>☐ Rapid Brain</td>
<td>☐ Rapid Post-UFE</td>
</tr>
<tr>
<td>☐ Rapid shoulder</td>
<td>☐ Rapid Pancreas</td>
</tr>
</tbody>
</table>

**Next Steps**

The recommendations included implementing the MRI Rapid Diagnostic model at other MRI centres in Ontario. This could be supported by the development of a toolkit for implementing the model; and to address change management challenges, a provincial program engagement can be designed to assist and facilitate rapid protocol implementation across Ontario’s hospitals.

The MRI Rapid Diagnostic Pilot was sponsored by the Toronto Central LHIN (Local Health Integration Network)

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