Improving MRI “Order-to-Scan” Times in an Inpatient Quaternary Academic Hospital Setting: Our Revitalization Project

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INTRODUCTION

• Quaternary care centers inherently bring increased diversity and complexity of cases resulting in increased order-to-scan (OTS) times for imaging

• Increased OTS times can lead to increased length of stays (LOS) and costs, as well as, decreased quality of care

• Therefore, there is a growing need for new efficient, equitable, and cost-effective strategies to offset these delays
PURPOSE

- To significantly reduce inpatient (IP) MRI order-to-scan (OTS) times through the implementation of multiple process improvement strategies
  - At the start of 2022, >20% of all inpatient IP MRIs had an OTS time of >48 hours; some >100 hours.
METHODS

**CURRENT STATE**
- No scanner utilization data
- ONE radiologist managing complex clinical discussions with ordering providers
- Limited privileges allotted to working supervisor
- Lack of proper use of “order to Dtime” function
- “Problem” studies sitting on the list for days
- Incomplete screening forms

**PILOT INTERVENTIONS**
- Obtain scanner utilization data and analyze to identify cases contributing to extended OTS times
- Expand privileges of working supervisor to manage clinical workflow instead of radiologist
- Educate accurate use of “order to Dtime” function
- Develop EMR integrated MRI screening questions/form to be completed at the time an order is placed
METHODS - Scanner Utilization Data

• Acquired scanner utilization metrics via MR vendors
  - Identified scanner idle times and common causes of delays
  - Examples of cases which contribute to idle table time
    • Anesthesia Cases
    • Surgical Procedure (Laser Ablations)
    • Claustrophobic Patients
METHODS

- Expand privileges of working supervisor to manage clinical workflow
  - Content expert
  - Evaluates “problem” cases (cases on hold, improper uses of “order for Dtime”, etc.)
  - Only contacts radiologist when necessary
  - Previous success in CT workflow (below)

- Radiology Service Line collaborated with the ED/IP service lines and EMR team to design MRI screening questions at time of order
  - Sample questions
    - (1) presence of a pacemaker
    - (2) history of claustrophobia
    - (3) patient’s ability to communicate
## RESULTS

<table>
<thead>
<tr>
<th></th>
<th>PRE-INTERVENTION</th>
<th>POST-INTERVENTIONS</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>January 2022</td>
<td>February 2022</td>
<td>March 2022</td>
<td>April 2022</td>
<td>May 2022</td>
<td>June 2022</td>
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<tr>
<td>Average OTS (hours)</td>
<td>28.7</td>
<td>29.1</td>
<td>18.40</td>
<td>18.12</td>
<td>21.33</td>
<td>17.24</td>
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<tr>
<td>Total IP MRs</td>
<td>646</td>
<td>723</td>
<td>730</td>
<td>811</td>
<td>825</td>
<td>758</td>
</tr>
<tr>
<td>IP MRs &gt;48 hours (%)</td>
<td>25%</td>
<td>23%</td>
<td>5%</td>
<td>3%</td>
<td>4%</td>
<td>3%</td>
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</tbody>
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RESULTS

MRI Inpatient Order-to-Scan Times

- Inpatient MRI Volume
- Inpatient MRI OTS Times
DISCUSSION/CONCLUSION

- Implementations:
  - Acquisition and analyzation of MR scanner utilization metrics
  - MRI manager with increased privileges to manage the workflow
  - Detailed MRI screening questionnaire at the time of ordering

- Significant decrease in OTS times by up to 40% despite 5-10% increase in IP MR volume
  - 29 hours to 17 hours

- Significant reduction in cases pending >48 hours
  - 23% to <5%