Improving Protocol Turnaround Time in Nuclear Medicine Division at a Tertiary Referral Medical Center

Hong Song, Paulo Castaneda, Luan Nguyen, Amin Etemad, Farshad Moradi, Benjamin Franc, Marc Willis

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Background and Problem Statement

• Delay in outpatient protocol of Nuclear Medicine studies causes delays in patient care and lowers satisfaction of the providers and patients.

• The cause of outpatient protocol delay at an academic tertiary referral center is multifactorial.

• We aimed to understand this complex process and improve the protocol turnaround time.
Target State: SMART Goal

• The goal of our team was to decrease outpatient nuclear medicine protocol turnaround time by 10% from 8/1/2021 to 12/15/2021.

• This goal was determined by group consensus that this was the best objective measurement.

• Protocol turnaround time: time from order placement to protocol finalization.
Methods and Results: Process Map – Current State

Physician Order → Rads Protocol → Tech Review → Schedule → Study

Orders in limbo

Tech Review → Single folder

Current protocol
Orders not needed but not cancelled
Research protocol
CSF leak or PET/MR protocols that require other division approval
Treatment protocol requiring special reviews
Methods and Results: Root Cause Analysis - Fishbone Diagram

Methods
- Rads/Techs workflow
- Batch protocol exams
- Unfamiliar with exams
- Order placed by MD extender

Materials
- EPIC no built-in checks
- Confusing order names
- Outside study/lab/meds not available
- Off-site out-patient clinics
- Teaching institution
- "Paper orders"

Exam requirements
- Repeat study
- No official policies on orders in limbo

Delay in protocol turnaround time

People

Environment

Policies and practice
Methods and Results: Key Drivers, Interventions and Countermeasures

**Key Drivers**
- Workflow for communication
- Division policy for protocol
- Redesign protocol workflow
- Wrong order/indication

**Interventions/Countermeasures**
- Seek help from reading room assistant
- Daily protocol problem at huddle
- Specify role of radiologists and technologists
- Cancel order in limbo > 1 week
- Technologist protocol folder revamp
- Automatic protocol by EPIC.
- Training materials for NM orders
- EPIC link to order description
Methods and Results: Process Map – Future State

Tech Review

- Separate folder
  - Current protocol
    - Orders not needed but not cancelled
  - Research protocol
  - CSF leak or PET/MR protocols that require other division approval
  - Treatment protocol requiring special reviews

- Single folder
Results: Improvement in protocol turnaround time (TAT)
## Future directions: Sustain Plan

<table>
<thead>
<tr>
<th>Interventions to sustain</th>
<th>Owner</th>
<th>Sustain method and frequency</th>
<th>Report to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revised Nuclear Medicine division policy regarding outpatient protocoling</td>
<td>Nuc Med Residents</td>
<td>Nuc Med residents taking ownership of protocoling, Daily</td>
<td>Attending on service</td>
</tr>
<tr>
<td>Monitoring protocol turnaround time</td>
<td>Nuc Med Technologist</td>
<td>Analytics update, Monthly</td>
<td>Manager</td>
</tr>
</tbody>
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Conclusions

• We employed a LEAN A3 problem solving approach to identify root causes and key drivers that caused delays in outpatient protocol turnaround time in Nuclear Medicine division.

• Our initial intervention in technologist workflow and revision of division policy significantly improved protocol turnaround time in our division.

• Additional intervention to improve communication to community referral providers are necessary to further improve protocol efficiency.