Improving Post-Admission Medication Reconciliation among Inpatient Providers through Cognitive Feedback: the “red dot”.

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**Background**

- Serious preventable medication errors occur in 3.8 million inpatient admissions (MTC, 2008) and cost approximately $16.4 billion annually (NEHI, 2008).

- An estimated 7,000 deaths in the U.S. each year are due to preventable medication errors. (IOM, To Err is Human, 1999)

- 22% of preventable medication reconciliation errors occur during admissions, 66% during transitions in care, and 12% during discharge. (J Qual Patient Saf, 2006)

- Hospitalized patients are more likely to experience an unintentional discontinuation of medications (JAMA, 2011).

- Computerized medication reconciliation tools are associated with a decrease in unintentional medication discrepancies upon admission (Arch Int Med, 2009).
Our Patient Safety Story

1. Anticonvulsant unintentionally discontinued on previous discharge
2. On admission, Provider did not recognize that pt with history of seizures had no anticonvulsant ordered
4. PTA meds not reconciled & Keppra not ordered for 5 days
5. Patient suffered a seizure due to medication withdrawal
## Problem Magnitude

### Average Number of Patients At Risk

<table>
<thead>
<tr>
<th>Facility</th>
<th>Patients with Unreconciled Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vidant Health</td>
<td>185.4</td>
</tr>
<tr>
<td>VMC</td>
<td>162.97</td>
</tr>
<tr>
<td>Community Hospitals</td>
<td>22.50</td>
</tr>
</tbody>
</table>

### Average % of Patients At Risk (Med Rec incomplete)

<table>
<thead>
<tr>
<th>Facility</th>
<th>Percent of Patients with &gt;0 Unreconciled Meds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vidant Health</td>
<td>30.33%</td>
</tr>
<tr>
<td>VMC</td>
<td>34.56%</td>
</tr>
<tr>
<td>Community Hospitals</td>
<td>16.06%</td>
</tr>
</tbody>
</table>

**Retrospective Aggregate Data 05/2016 – 07/2016**
Aim Statement

- To reduce the number of patients at risk of medication-related adverse events or near misses by > 50% by improving post-admission medication reconciliation.

- **Measurement of change:** Census of patients at risk across Vidant Health.

- **Interventions:**
  - Provider Education
  - Cognitive Feedback - “the Red Dot”
  - Periodic Feedback
Cognitive Feedback

- **“Red Dot”** – Real time feedback directly on MyList.
- **Built-in functionality** – Double click the red dot to go straight to Med Rec order entry activity.
- **Cognitive Aid** – Replaces the need to “remember to follow up”.
- **Transparency** – Team Senior residents (and Attendings) can keep track of which patients still have outstanding med rec.

**Table**

<table>
<thead>
<tr>
<th>Admission Date</th>
<th>Unit</th>
<th>Patient Name</th>
<th>PCP</th>
<th>Age/Sex</th>
<th>PTA Rec</th>
<th>Provider/Provide</th>
<th>Code Status</th>
<th>Patient Care Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/1/15</td>
<td>3EAS-PIT</td>
<td>Pharmacy, Riley</td>
<td>Pharmacy</td>
<td>25yrs / M</td>
<td>✔️</td>
<td>Inpatient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/1/15</td>
<td>1SO-PIT</td>
<td>Pharmacy, Brandi Vmc</td>
<td>Pharmacy</td>
<td>34yrs / F</td>
<td>✔️</td>
<td>Inpatient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/14/16</td>
<td>PACU-PIT</td>
<td>Test, Wex</td>
<td>Test</td>
<td>41yrs / F</td>
<td>✔️</td>
<td>Inpatient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/23/16</td>
<td>ARPY-PIT</td>
<td>Test, Wex</td>
<td>Test</td>
<td>37yrs / M</td>
<td>✔️</td>
<td>Inpatient</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Length of stay > 6 hours and at least 1 PTA med that has not been reconciled.
Outcomes

Patients At Risk in Inpatient IM & FM Resident Teams

- **Proof of Concept**
- **No halo effect**
- **Accountability**
- **Change of Rotation**
- **Training new group**

* = Multiple factors including change of rotation and off service residents not part of the initial education group.
Outcomes

Over 70% drop in the number of patients at risk on IM & FM services in the first 2 weeks.
Overall Results

Average % of Patients At Risk (Med Rec incomplete)

- System % Avg: 30.33%
- VMC % Avg: Facility 34.56%
- VCOM % Avg: 15.00%

55% reduction at VMC leading to 50% reduction across VH

Red – July 2016
Orange – Jan 2017

No reduction seen at “control” sites over the same period.
Accountability = Sustainability

1. **Clear expectations** – provider education
2. **Clear capability** – new cognitive aid in EHR list
3. **Clear measurement** – absence of “red dot” on patient list
4. **Clear feedback** - attending could monitor and provide feedback
5. **Clear consequences** - “it isn’t about punishment”; should the consequences be viewed from the eyes of the patient?

- Personal accountability = self-reflection, non-punitive, better individual actions leads to better team performance
Lessons Learned

- Medication Reconciliation is complex but integral to high quality, safe patient care.

- Provider education with the appropriate EHR tools is an effective intervention for improving clinical behavior. (Providers want to do the right thing)

- Proof of concept outside residency training – Introduced to ECHI Hospitalist Service, with excellent results (>75% risk reduction within first week). As of Mar 2017, VMC has > 70% fewer patients at risk.

- Accountability = Sustainability. Will this model work for other initiatives? Can we use the new definition of accountability and apply it to all clinical decision support?
Future Potential

- Risk prioritization for admitted patients
- Ambulatory and ED medication reconciliation
- Discharge-Readmit medication reconciliation workflow (ongoing)
- Assessment in regional hospitals by Pharm Tech as proxy for quality medication history (test hypothesis)