Reducing Insulin Administration Errors: The Independent Double Check

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Introduction

Acreditation Canada and the Institute for Safe Medication Practices have recommended independent double checks for select high alert medications which have a heightened risk for causing harm when they are used in error. Medication events derived from the Patient Safety and Learning System (PSLs) serve to identify which medication should be examined for independent double checks to reduce error rates.

What is the Patient Safety and Learning System (PSLs)?

It is a voluntary safety incident reporting process, designed to capture trends. Medication events are reported and reviewed which allows for trend analysis and focus quality improvement efforts. Voluntary reporting systems are known to under report actual error rates.

What are Independent Double Checks (IDCs)?

It is a process where a second practitioner verifies a procedure without any communication of the expected result from the first practitioner. Maintaining independence of the second check eliminates bias and maximizes odd that an error will be caught by the second practitioner.

Objectives

Primary objectives
- Determine which medications has the highest administration events
- Quantify the change in the number of administration events when comparing the number of historical events to the number of events found after implementation of independent double checks

Secondary objectives
- Investigate if simplifying event documentation increases the rate of voluntary reporting

Methods

PSLs Review
- All available pre-study PSLs reports (10 Jul 2010 to 9 Aug 2011) were analyzed to identify medication administration report trends.
- Insulin events were determined to be the most prevalent and became the target for the study.
- Evaluation of sites found Saanich Peninsula Hospital (SPH) had the highest reporting and became the trial site

Design
- Single center, prospective study with retrospective controls

Patients
- Patients who were identified as having received insulin in acute or extended care at SPH during predefined study periods
- Consent not required as quality improvement initiative

Intervention
- A new independent double check diabetic record was introduced on 5 Nov 2011 with addition of a row for initials of a second practitioner.
- Event codes were included to simplify near miss reporting
- Independent double check education was provided by Clinical Nurse Educator
- Data collected between 7 Nov 2011 and 30 Mar 2012

Control
- Standard insulin administration without independent double check as recorded on historic diabetic records
- Data collected between 1 Sep 2010 and 31 Jul 2011

Outcome
- Insulin administration events of incorrect product, dose or time, derived from PSLs reports
- Event rates per dose administered derived from patient diabetic records
- Events prevented (good catches) through identification by the second check, derived from diabetic record event codes

Results

Table 1: Event/Dose Contingency table and Rate

<table>
<thead>
<tr>
<th>Event</th>
<th>Dose</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doses</td>
<td>2591</td>
<td>100.0%</td>
</tr>
<tr>
<td>Independent Double Checks</td>
<td>2703 (91.6)</td>
<td></td>
</tr>
<tr>
<td>Coded</td>
<td>111 (0.037)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: IDC Documentation Success Rate

<table>
<thead>
<tr>
<th>Type of Event</th>
<th>Number</th>
<th>Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doses</td>
<td>2591</td>
<td></td>
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<td></td>
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</tbody>
</table>

Figure 1: Top 10 Medications for PSLS Administration Reports

Figure 2: Independent Double Check Diabetic Record

Discussion

Findings
- Implementing independent double checks for administering insulin in this study showed a statistically significant reduction in the number of PSLS reported events
- Independent double checks resulted in a lower than expected number of good catches, possibly due to extra vigilance on behalf of the first practitioner or voluntary reporting limitations
- The study was not successful in increasing the rate of voluntary reporting due to the low acceptance rate of good catch codes, possibly due to its departure from PSLS reporting and nursing practice of charting by exception. The good catch in the study was reported in PSLS

Limitations
- Voluntary reporting used in the study is generally understood to underestimate the actual number of events that occur in medication administration systems
- Since initiation of drug administration falls solely to the first practitioner, independent double checking has limitations by not correcting for missed doses

Conclusions
- This study quantified the rate of insulin events reported in the PSLS prior to implementing independent double checks and found a rate of 0.286% events per administered insulin dose
- Once independent double checking was in place, the rate dropped to 0.037% events per insulin dose
- The study showed a statistically significant reduction in the number of events occurring after implementation of independent double checks
- Occurrence of a good catch in the study illustrated independent double checks prevented an event
- Implementing independent double checks when administering insulin doses in acute and extended care settings reduced the number of events reported in a voluntary medication safety system.

References available on request