Quality/Process Improvement Project: Independent double checks of PCA Pumps

The committee that monitors the safe administration of opioid pain relievers noticed a nearly 2-fold increase in safety reports one month last spring. Examining those reports and talking to involved parties indicated there were potential hazards related to programming the CADD Solis pump for the highest risk (“Restricted”) Patient Controlled Analgesia (PCA) pain medicines. Steps are underway to reorganize the drug library to lessen the risk of “picking errors” on the pump, and reeducate staff on this matter. While those are underway Committees involved in Quality and Safety, Medication Administration Safety, the Clinical Nurse Specialists and Collaborative Governance Pain Management committees were all alerted to this issue for input and immediate action. Research indicates Independent Double Checks can be a robust way to prevent 90% of “Sound-Alike/Look-Alike drug errors from reaching the patient; if done in a proper, sustainable way. Lunder 9, was beginning a Partners’ Clinical Process Improvement Program (CPIP) to promote patient safety and they agreed to test the best way to do an Independent Double Checks on the PCA medicines, and make recommendations for all MGH inpatient areas.

Higher than usual concentration (e.g. 10mg/mL or higher) Morphine or Hydromorphone, as well as higher risk opioids like Fentanyl or Methadone are considered “Restricted” and can only be ordered with the approval of specialists from the Pain or Palliative Care Service. The majority of these PCA drugs are ordered on Lunder 9, which became the new medical oncology unit after their move from Phillips House. Existing safety systems like special ordering requirements; smart pump technology, pump-checks every 8 hours, bar-code-assisted medication administration, and an electronic medication administration record are in place. Despite these safeguards, if the drug concentration was not properly entered into the pump, the patient could receive up to a 20-fold stronger or weaker dose than intended. The CPIP team led by Hannah Lyons and Madeleine Bohlen realized the pump could have this wrong concentration error while appearing to be set up right and having the barcode scanned properly (see Figure 1).
**Figure 1**: The pump can display the right drug, and PCA settings; the cassette can scan and confirm the correct medication is used, but both the pump settings and cassette requires human confirmation of the Medication Concentration.

A literature review was conducted and both the Food and Drug Administration (FDA) and the Institute for Safe Medication Practice (ISMP) recommend an independent double check (IDC) be done. Their definitions are consistent in the message of the steps needed, including:

- Two clinicians
- Separately check settings in accordance with the physician’s order
- **Done alone & apart from each other,**
- Compare and communicate results

The nurses on the acute care oncology unit at MGH were surveyed to determine their baseline understanding of an IDC. An important part of the IDC **Done alone & apart from each other** (emphasis added) was a key step that most nurses were not aware of (see Figure 2). In fact only 2.5% of nurses surveyed provided a definition of an independent double check aligned with the FDA & ISMP steps. Training was conducted and a process for documentation implemented. A second intervention included targeted education initiatives such as posters of key points and web-based training of the IDC definition, with close monitoring of processes and documentation. After this initial improvement activity, just over a third of IDC’s met the established criteria. Additional discussions and training raised that rate to 70% after second wave of improvement.

![Figure 2: Survey of the Nurses on the Unit Prior to Implementing the Required Double Checks.](image)

**Nurses’ understanding of the steps involved in an independent double check (N=40)**

- 2.5% provided a correct and complete definition of an IDC
- 17.5% provided an incorrect definition of an IDC
- 80% provided a partially correct definition of an IDC

After repeated tests of change, a simplified approach to understanding, conducting and documenting IDC was developed. Adherence to this requirement reached 100%, but needed sustainability in the form of visible reminders to do an IDC whenever these high risk PCA medicines are ordered. Work is underway to generate this reminder through eMAR to alert nurses of the IDC need. A recent survey showed 2% of nurses believe doing an IDC does require additional time, but 96% say they feel their practice is safer because of this process. More importantly, medication errors with high risk PCA drugs have been prevented because of these double checks. Given that success, Independent Double Checks for “Restricted” PCA opioids will be rolled out to the rest of the hospital and integrated into the new training programs.