Keeping Track of Drug Limit Library Updates
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Introduction
• Objective:
  Learn from the drug limit library (DLL) update process to inform the future of medical device interoperability in the healthcare environment.

• Motivation:
  Alerts are being generated by different DLLs in the same period of time. We would like to know how widespread the problem is within and across hospital systems.

Results
• How is the update process?
  Up-to-date pumps were never more than 80% of the total pumps in each update cycle for both hospitals.

• How many DLLs are working in a hospital at the same time?
  Each time that a new update is released, the number of DLLs on all pumps in a hospital increases.

Pump Status Classification: Based on pump status reports
• Current [C]: Up-to-date pumps
• Pending [P]: Current DLL pending to be installed on the pump
• Not Current [NC]
  • NC-NDT: no transferred date
  • NC-OP: outdated library version pending
  • NC-NC: not current & no communication info
  • NC-L: not current & communication long time ago

• N/DATASET: No information on which library was on the pump

• How important is this problem?
  Changes made from one version to another may be minor. However:
  • There could be missed or false alerts that can also be of safety concern
  • Delays in the DLL update process are not working correctly at all

• How long were the pumps up-to-date?
  • HOSPITAL A
    - Current at the end of 3 / 3 Update Cycles: 497 (58% of the pumps).
    - All of these were current 70 days on average.
    - Only 230 pumps (27%) were current at least 80% of the time (76 days).

  • HOSPITAL B
    - Current at the end of 2 / 3 Update Cycles: 194 (22.8%) of the pumps were current at the end of two UC.
    - 175 pumps (25.51%) on average were current for 30 days.

• How important is this problem?
  Changes made from one version to another may be minor. However:
  • It creates confusion for the nursing staff
  • If an important/urgent update needs to be implemented, the lag may cause patient harm (*patient safety issue*)
  • There could be missed or false alerts that can also be of safety concern

Data & Processing
Pump status reports were obtained from two hospitals during specific periods of time. These reports were generated by the vendor provided system management tool and each contained information snapshot of each pump in the network at the time of report.

Summary of Findings
- Delays in the DLL update process are not unique
- Smart Infusion Pumps are part of a system in which they interact with other devices and agents
- Technologies by themselves do not guarantee system reliability
- Reliable update process = knowledge + communication among staff
- Interventions are needed to ensure that medical devices are working correctly at all times
- Reliability is critical when patient safety is at risk if human and machines errors cannot be prevented.

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