
Abstract:

BACKGROUND: The most serious medication errors occur during intravenous administration. The potential consequences are more serious the more critical and younger the patient. Smart pumps can help to prevent infusion-related programming errors, thanks to associated dose-limiting software known as “drug library”. Drug libraries alert the user if pre-determined high dosage limits are exceeded or if entry is below pre-determined low dosage limits.

OBJECTIVE: To describe the process for developing a specific drug library for a pediatric intensive care unit (PICU) and the key factors for preventing programming errors.

METHODS AND MATERIALS: The study was performed by a multidisciplinary team consisting of a clinical pharmacist, a PICU pediatrician, and the chief nurse of the unit. The process of developing the drug library lasted seven months. A literature review was carried out to determine standard concentrations and accurate limits for intravenous administration of high-risk drugs. Alaris(Â®) syringe pumps and Guardrails(Â®) CQI v4.1 Event Reporter software were used.

RESULTS: Several manufacturers offer smart pump technology. Users should be aware of differences in features, such as definition of parameters and associations between them, definition of safety limits, organization of the drug library, and data use. Our infusion pump technology covered 108 drugs. Compliance with the drug library was 85% and nurses’ acceptance of the drug library was high as 94% would recommend implementation of this technology in other units. After nine months of implementation, several potentially harmful infusion-related programming errors were intercepted.

CONCLUSIONS: Drug libraries are specifically designed for a particular hospital unit, and may condition the success in implementing this technology. Implementation of smart pumps proved effective in intercepting infusion-related programming errors after nine months of
implementation in a PICU.