Academic Medical Center | Patient Safety Organization
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Patient Safety Alert

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RCA Information Exchange – PCA Pump Alarm Update

Root Cause Analysis Information Exchange Tool (RCAIE)

Members were recently given a demonstration of the AMC|PSO's newly developed Root Cause Analysis Exchange (RCAIE). This secure, web-based tool will be used for transmission of standardized RCA data to the AMC|PSO. The RCAIE is based on the CRICO Clinical Coding Taxonomy and standardizes key data fields, including event type, contributing factors, and action interventions. It will be piloted at several member institutions in the summer of 2012 and will then be used by all AMC|PSO members.

This tool will provide a streamlined process for the aggregation and analysis of high-significance adverse events and will also facilitate mapping of these events to malpractice claims data. This will provide the foundation for robust analytic review and is expected to provide valuable insights into those adverse patient outcomes that eventually become malpractice actions. Additionally, analysis of RCA action interventions will include review of efficacy for the identification of best practices for responding to particular events.

Currently, members are presenting RCA events with broad applicability or high urgency at AMC|PSO convening sessions. These sessions include facilitated discussions by institutional risk and safety leaders and their subject matter experts. Discussions are focused on the evaluation of common vulnerabilities and collaboration on interventions that can be widely disseminated. Data gathered from the RCAIE will be used to inform and enhance these convening sessions.

PCA Pump Air in Line Alarms

The AMC|PSO performed a review of safety issues involving ambulatory pumps used to administer patient controlled analgesia (PCA). Recurrent "air in line alarms" shortly after set up has been identified as one issue of concern.

This issue has been particularly noted when PCA medications were administered via cassette. Although no patients were harmed, alarm activation halted the delivery of pain medication to these (mostly) postoperative patients. Upon examination, no air was seen in the cassette.

The alarm issues were reviewed by hospital committees including pharmacy staff and biomedical and clinical engineers. After several rounds of testing and analysis, no clear cause for this apparent alarm malfunction could be found.

AMC|PSO safety strategies include instructing users not to disable the pump's "air in line" alarm and reminding staff that distractions caused by PCA pump troubleshooting, particularly when combined with the pressure to provide prompt pain relief, had the potential to increase the risk of medical error.

Updated Safety Strategies

Preliminary discussions with the manufacturer indicated that a potential cause for the alarm might be pinching of the cassette pump tube between the pump chassis and the cassette. This would cause a gap between the pump tubing and the air detector which the pump reads as air, triggering an "air in line" or "cannot start pump" alarm. Removal and reattachment of the cassette could cause the pump tube to "settle" into the correct position, thus resolving the issues.

This condition could occur if the cassette was attached to the pump using a rocking motion from the rear. There wouldn't be any visual indicators on the pump when this condition occurred, but pinch points might be visible on the cassette tubing.

Correct positioning of pump tubing should be carefully reviewed and can be confirmed by running a finger along the top of the pump tube before attachment.

While the manufacturer continues to investigate this issue and evaluate the need for design modification, member organizations will continue to gather data and monitor the efficacy of this interim approach.

Fig. 1. Tubing position that may result in this condition

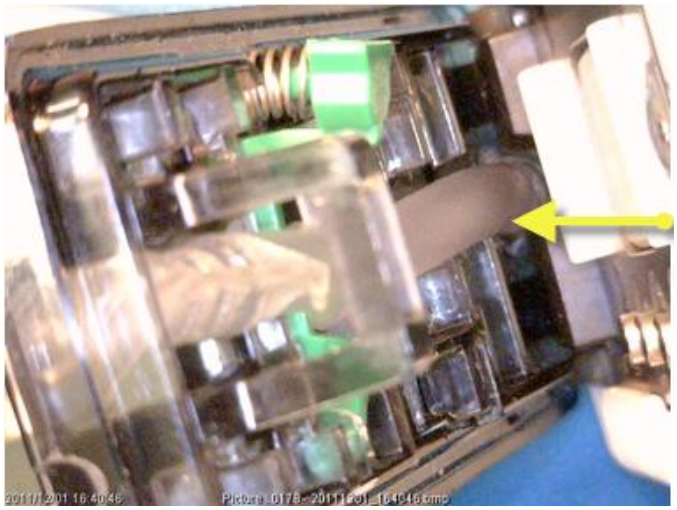

Fig. 2. Pump tube in the correct position