First National Survey of Patient-Controlled Analgesia Practices

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Abstract

Background:

Using PCA pumps to help manage patients' pain has become accepted medical practice and is generally considered safe and effective. However, according to reports made to the Food and Drug Administration between 2005 and 2009, more than 56,000 adverse events and 700 patient deaths were linked to patient-controlled analgesia (PCA) pumps. One out of 378 post-surgical patients are harmed or die from errors related to the patient-controlled pumps that help relieve pain after surgical procedures, such as knee or abdominal surgery. [Association for the Advancement of Medical Instrumentation, "Infusing Patients Safely: Priority Issues From AAMI/FDA Infusion Device Summit" (2010)]

Objective:

To determine (1) the practices and standards currently followed by hospitals in PCA administration; (2) the way hospitals view the role of technology in administration and monitoring of opioids; and (3) the technology, training and information healthcare providers think are important for greater patient safety in the future.

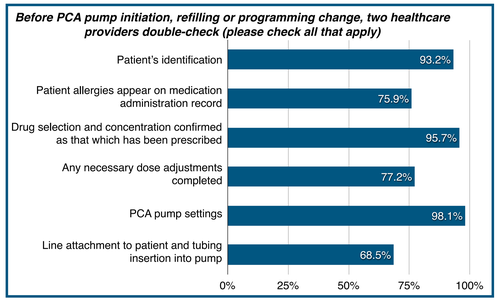
Method:

During March and April 2013, a national survey of hospitals was conducted regarding practices related to PCA by A Promise to Amanda Foundation and the Physician-Patient Alliance for Health & Safety. The survey questions were prepared with the assistance and input from a panel of health experts.

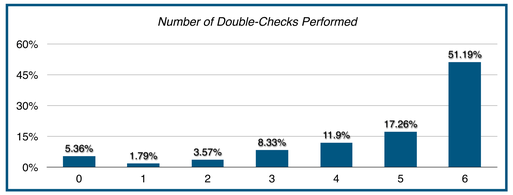
Hospitals from across 40 US states responded to the survey. Respondent hospitals were evenly split between non-teaching (45 percent) and teaching institutions (55 percent). Moreover, they came from a range of sizes, from a small of 14 beds to the largest having more than 1,500 beds, with the median hospital having 200 beds. Almost half (47 percent) of the 168 respondents identified themselves as pharmacists. The remaining respondents identified themselves as either physicians (18 percent) or a non-physician healthcare provider, such as a nurse or respiratory therapist (35 percent).

Double-Checks to Verify Proper PCA Connection and Settings

There is great variation between what double-checks are made:



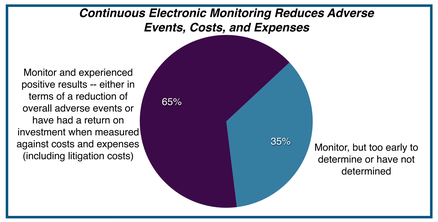
1 out of ten hospitals performed one or less double checks to ensure that the correct patient is receiving the correct dosage from a PCA pump that has been programmed and attached correctly, although approximately 70% of the PCA adverse events are due to errors associated with pump use (e.g., misprogrammed doses and concentrations, installation of the wrong drug or concentration) [Pennsylvania Patient Safety Authority, "Making Patient-Controlled Analgesia Safer for Patients" Vol. 8, No. 3 (September 2011)].



Technological Safety Practices

Continuous Electronic Monitoring Reduces Adverse Events, Costs, and Expenses

- Of those hospitals that monitor some or all of their patients with pulse oximetry or capnography, more than 60 percent have experienced positive results -- either in terms of a reduction of overall adverse events or of costs and expenses. The other 40 percent of those that monitor say it is "too early to determine or have not determined."
- Those using smart pumps with integrated end tidal monitoring were almost three times more likely to have had a reduction in adverse events or a return on investment in terms of a reduction in costs and expenses (OR=2.789; 95% CI 1.112-6.996).

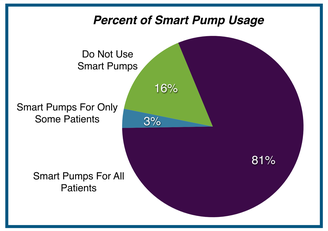


Continuous Electronic Monitoring Will Become Standard Procedure

Of the hospitals that are not electronically monitoring any of their patients, almost nine out of 10 (86.7 percent) say they are considering the use of monitoring.

Smart Pump Usage:

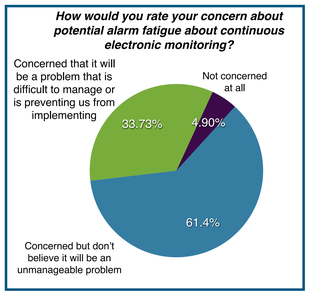
- **Almost one out of every four hospitals do not use "smart" pumps** that contain safety software and medication "libraries" for greater patient safety for all of their patients
- **More than three out of every 20 hospitals are not using "smart" pumps for any of their patients**

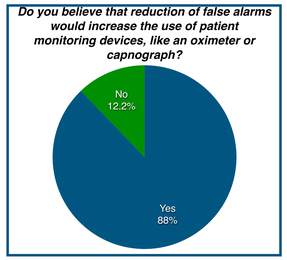


Role of Alarm Fatigue

Concern about alarm fatigue is extremely high and is preventing implementation of patient safety measures:

- More than 19 in 20 hospitals (95.1 percent) say they are concerned about alarm fatigue.
- Almost one in ten hospitals (87.8 percent) believe that a reduction of false alarms would increase the use of patient monitoring devices, like an oximeter or capnograph.





Hospitals say tools and training would be of assistance in managing alarm fatigue:

- Seven out of 10 hospitals (70.7 percent) would like "a single indicator that accurately incorporates key vital signs, such as pulse rate, SpO2, respiratory rate, and etCO2."
- Those concerned alarm fatigue is an unmanageable problem were more than twice as likely to want a single-indicator assessment tool (OR=2.278; 95% CI 1.073-4.838) and recommendations for ease of assessment for their nursing staff (OR=2.039; 95% CI 0.992-4.190)

Education of Patients

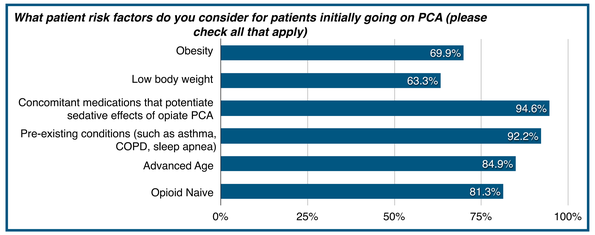
Patients are probably safer at hospitals that provide information about PCA:

- Those using only smart pumps and smart pumps with integrated end tidal monitoring were almost four times (OR=3.839, 95% CI 1.411-10.447 and OR=3.793, 95% CI 1.070-13.444 respectively) as likely to provide their patients with educational materials. Moreover, those hospitals that have been using smart pump technology for the last three to five years were almost six and a half times more likely to provide their patients with information on the purpose of monitoring (OR=6.440, 95% CI 1.436-28.885).
- The likelihood that the patient will be monitored with either pulse oximetry and/or capnography goes up when the hospital is providing their patients with monitoring information. This is three times more likely for patients at hospitals monitoring with pulse oximetry (OR=3.327; 95% CI 1.241-8.921), and according to the survey responses is higher for all hospitals that monitor their patients electronically.

Patient Risk Factors Considered

About 2 out of every 3 hospitals are not considering six major patient risk factors:

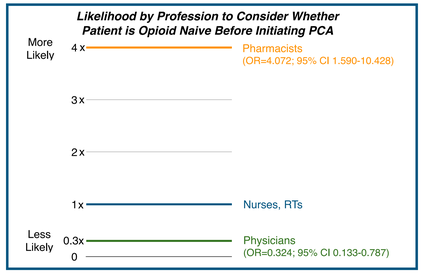
- Despite much discussion by key healthcare organizations like The Joint Commission and the Institute for Safe Medication Practice about assessing the risk factors of patients, there is a tremendous variation between the treatment being received by patients across the country.
- More than 60 percent of respondents are considering five or less factors, with less than 40 percent indicating that they were considering all six patient risk factors.

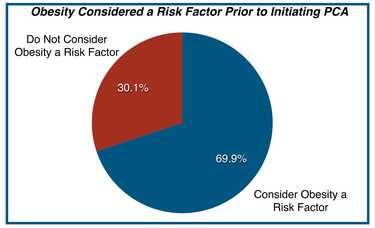


Opioid Naive

Almost 1 out of 5 hospitals are not assessing patients for being opioid naive:

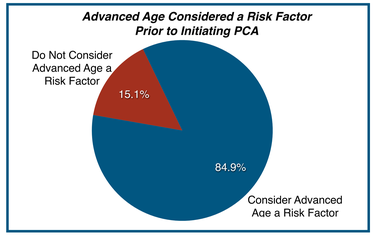
- The Joint Commission recommends taking "extra precautions with patients who are new to opioids or who are being restarted on opioids" [The Joint Commission, Sentinel Event Alert, Issue 49, August 8, 2012].
- Pharmacists were four times more likely to consider opioid naive as a risk factor versus other healthcare professions.
- However, physicians were approximately 70 percent less likely than other types of respondents to say that they consider opioid naive as a patient risk factor.





Obese Patients

Three out of every 10 hospitals do not consider obesity as a patient risk factor, although many studies have shown the increased risk of using anesthesia with obese patients [J. Ingrande and H. J. M. Lemmens, "Dose adjustment of anaesthetics in the morbidly obese" British of Journal of Anesthesia Volume 105, Issue suppl 1]

Advanced Age

About three out of every 20 hospitals do not consider advanced age as a patient risk factor, even though The Joint Commission cautions against the use of opioids in older patients because of the heightened risk of oversedation and respiratory depression [The Joint Commission, Sentinel Event Alert, Issue 49, August 8, 2012].