PATIENT-CONTROLLED MORPHINE OVERDOSE

Pump was programmed for lower morphine concentration, which was not available

Take-Home Points from “Death by PCA” Commentary by Rodney W. Hicks, PhD, RN, FNP

- PCA is widely used and is generally an effective method of postoperative pain management.
- While deaths from PCA are rare, they can occur and this heightens the importance of developing safe processes surrounding PCA use.
- Safe PCA use is highly dependent on a team comprised of clinicians, administrators, biomedical engineers, and quality improvement personnel.
- Organizations that employ PCAs must adopt and integrate technology - such as bedside barcoding and monitoring with capnography and oximetry - in order to facilitate safe medication use.

1 Problem

What
Problem(s)
Morphine overdose, patient death

When
Date
Unknown

1 mg/mL cassette not available

Where
Facility, site

Unit, area, equipment
Post-anesthesia care unit & ward

Task being performed
Infusion pump

Impact to the Goals

Patient Safety
Patient death

Employee Safety
Risk of second victim

Compliance
Never event

Patient Services
Overdose of morphine

Property/ Equipment
1 mg/mL morphine concentration not available

Labor/ Time
Response, investigation

Frequency
Mortality from user programming errors with this device estimated to be a low likelihood event (1 in 33,000 to 1 in 338,800)

2 Analysis

More Detailed Cause Map - Add detail as information becomes available.

Why?

Effect
Cause

NOTE: Read the Cause Map from left to right with the phrase "Was Caused By" in place of each arrow.

3 Solutions

<table>
<thead>
<tr>
<th>No.</th>
<th>Action Item</th>
<th>Cause</th>
<th>Owner(s) (Names)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Improve supply chain to avoid product shortages</td>
<td>1 mg/mL concentration morphine not available</td>
<td>Purchasing</td>
</tr>
<tr>
<td>2</td>
<td>Store only one strength in a dispensing cabinet</td>
<td>Higher concentration of morphine used</td>
<td>Pharmacy</td>
</tr>
<tr>
<td>3</td>
<td>Standardize and limit the concentrations for PCA agents available</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Use of smart pumps which suspend infusion when physiological parameters are breached</td>
<td>Too much morphine administered</td>
<td>Chief executive/ operating/ nursing/ medical officer</td>
</tr>
<tr>
<td>5</td>
<td>Use of barcoding technology</td>
<td>Overlooked dose variation</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Perform independent double checks of order, product, and settings</td>
<td>Lack of effective double check</td>
<td>Licensed clinicians</td>
</tr>
<tr>
<td>7</td>
<td>Use of monitoring technology</td>
<td>Lack of monitoring equipment</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Assess &amp; record vital signs including depth of respiration, pain and sedation</td>
<td>Signs of deep sedation missed</td>
<td></td>
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</tbody>
</table>