PATIENT-CONTROLLED MORPHINE OVERDOSE

Cause Map

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
	Different, unusual, unique	1 mg/mL cassette not available
Where	Facility, site	Post-anesthesia care unit & ward
	Unit, area, equipment	Infusion pump
	Task being performed	Pain management/recovering from C-section

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)

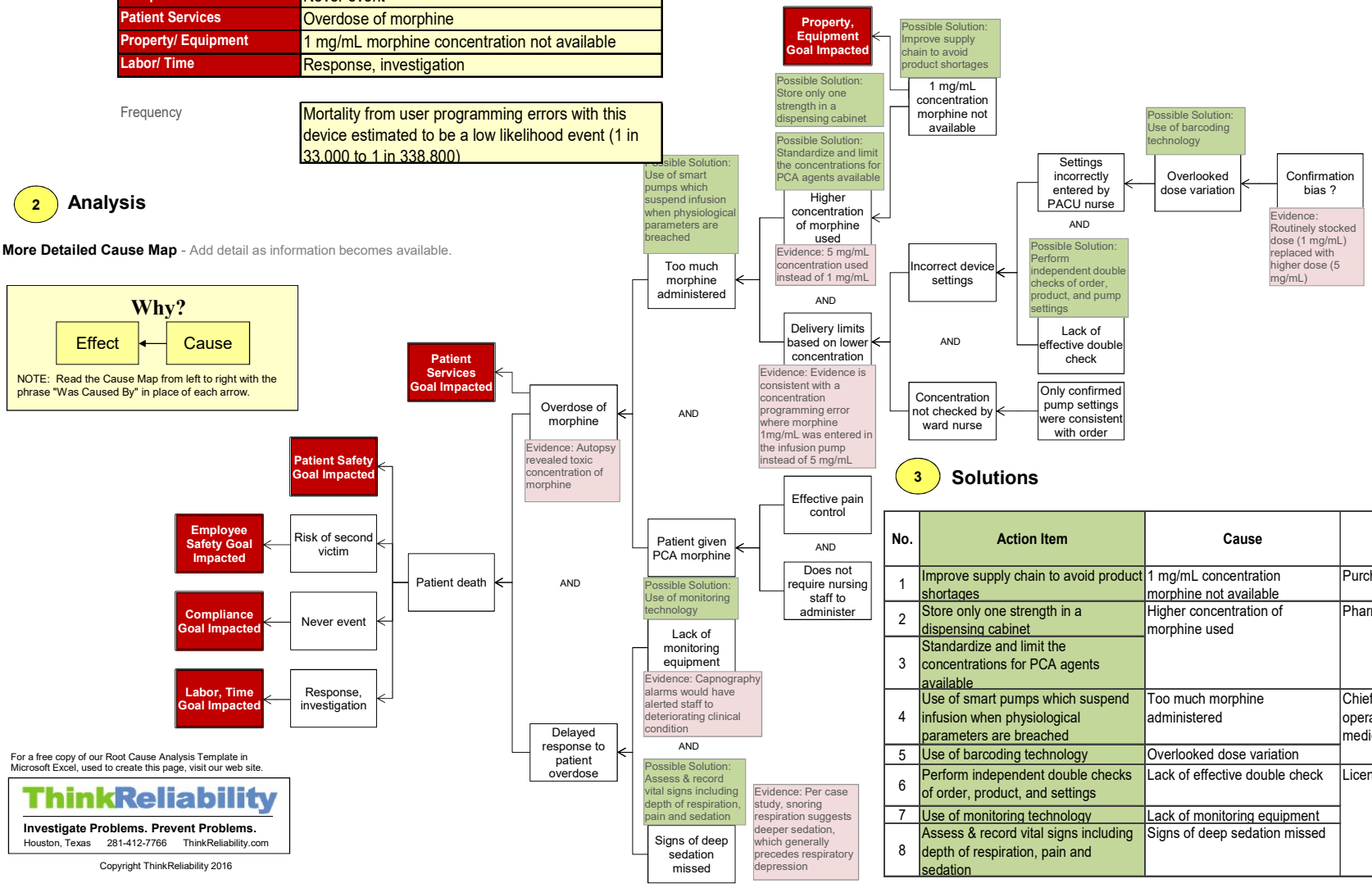
2 Analysis

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

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

For a free copy of our Root Cause Analysis Template in Microsoft Excel, used to create this page, visit our web site.