

Nurses' Risk Without Using Smart Pump Technology

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Allied for **Patient Safety**

Introduction

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Nurses risk without using smart pumps

- Harding, A.D., Connolly, M.W., & Wilkerson, T.O. (2011). Nurses risk without using smart pumps. *Journal of Nursing Administration's Healthcare Law, Ethics and Regulation*, 13(1), 17-20.

Why write on this topic?

- Low initial use of the IV smart pump library
- Valid concerns and barriers to nurses using the IV smart pumps
- Nagging legal questions that remained unanswered – liability risks for direct care nurses
- Focus on providing safe effective care

Smart Pump Adoption

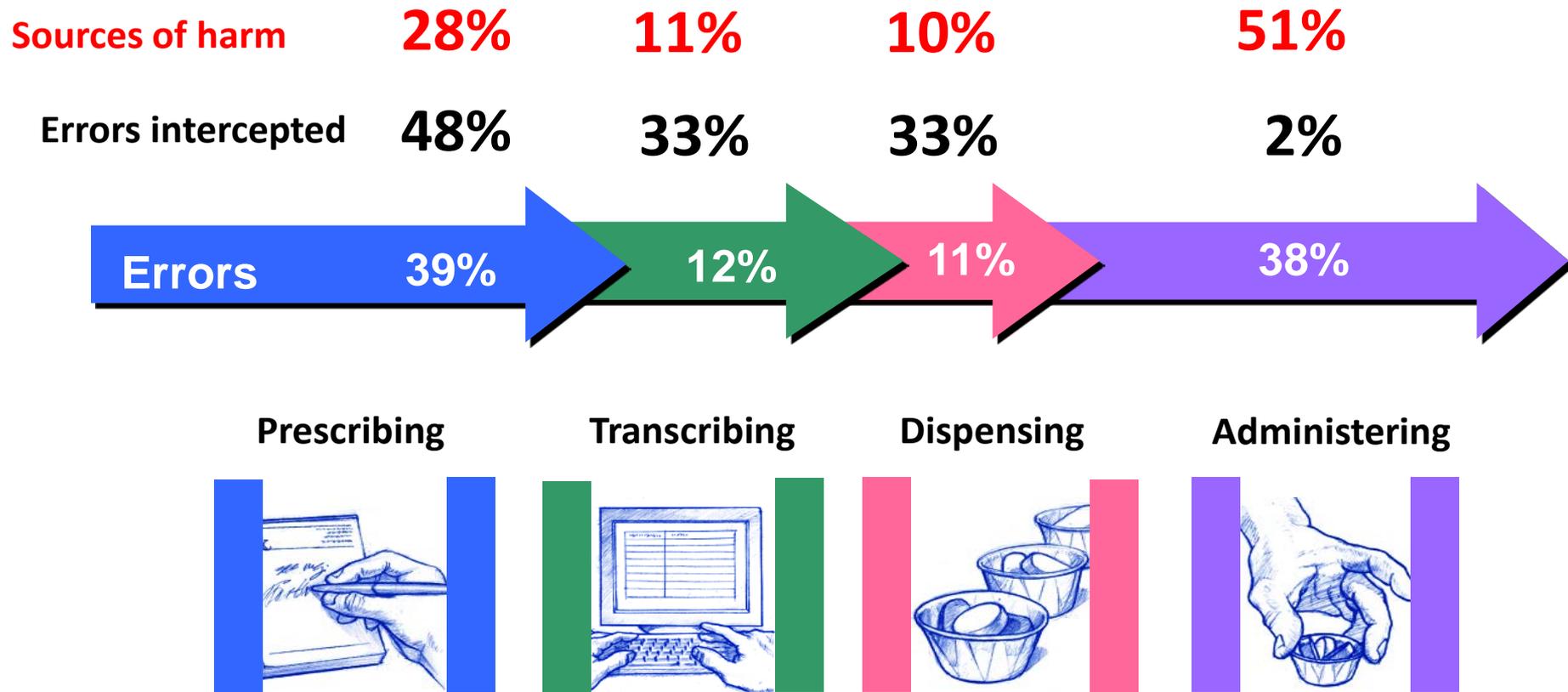
- Evolving use and recognition of safety value
 - ~69% adoption in acute care*
 - Transitioning from “this is how we’ve done it” to evidence-based practice
 - Newer technologies are not plug and play

* State of Pharmacy Automation. Pharm Purch Prod. 2012; (9)8.

Smart Pump Adoption

- Challenges to full adoption are varied
 - Interdisciplinary approach
 - Recognize impact on workflow
- Limited appreciation of inherent risks

Errors in the Medication Use Process



Leape, et al. JAMA 1995;274:35-43

IV Medication Errors

- IV medications are associated with 54% of potential ADEs and increased risk of harm
 - Drugs administered IV have immediate bioavailability
 - Many “high-alert” drugs, which have a narrow therapeutic range, are given by infusion

Cohen MR. (Ed.) Medication errors (2nd ed.). Washington, DC: American Pharmacists Association; 2007.

Fields M., Peterman J. Intravenous medication safety system averts high-risk medication errors and provides actionable data. *Nurs Admin Q.* 2005;29(1):78-87.

Kaushal, R, Bates, DW, Landrigan, C, McKenna, KJ, Clapp, MD, Federico, F, et al. Medication errors and adverse drug events in pediatric inpatients. *Journal of the American Medical Association* 2001;285(16): 2114-2120.

IV Medication Administration Errors

- Few prospective studies offer detailed analysis regarding the incidence and causes of IV medication *administration* errors
- Limited research findings suggest:
 - Wrong rate errors are common, particularly with injection of bolus doses
 - Errors associated with IV infusion pumps occur frequently and are diverse in nature

Han PY, Coombes, ID, Green, B. Factors predictive of fluid administration errors in Australian surgical care wards. *Qual Safe Health Care* 2005;14:179-184.

Husch, M, Sullivan, C, Rooney, D, Barnard, C, Fotis, M, Clarke, J, et al. Insights from the sharp end of intravenous medication errors: implications for infusion pump technology. *Qual Saf Health Care* 2005;14:80-6.

Taxis, K, & Barber, N. Causes of intravenous medication errors: an ethnographic study. *Qual Safe Health Care* 2003;12(5):343-347.

IV Medication Administration Errors

- High-profile reports of injury and death have created greater awareness
 - Indianapolis and LA heparin errors
 - Bupivacaine-related death (IV instead of epidural)



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Quaid recalls twins' drug overdose

Actor Dennis Quaid and his wife, Kimberly, discuss their ordeal at Cedars-Sinai Medical Center, where their newborn twins were given an overdose of the blood thinner heparin in November.

The actor and his wife speak out for the first time about their infants' health scare.

By Charles Ornstein, Los Angeles Times Staff Writer
January 15, 2008

Before actor Dennis Quaid went to bed Nov. 18, he gave one last call to Cedars-Sinai Medical Center, where his newborn twins were being treated for staph infections.

"Oh, they're fine," Quaid recalled a nurse telling him about 9 p.m. "They're just fine."

Actually, they weren't.



State Confirms Medical Error In Death Of Teen

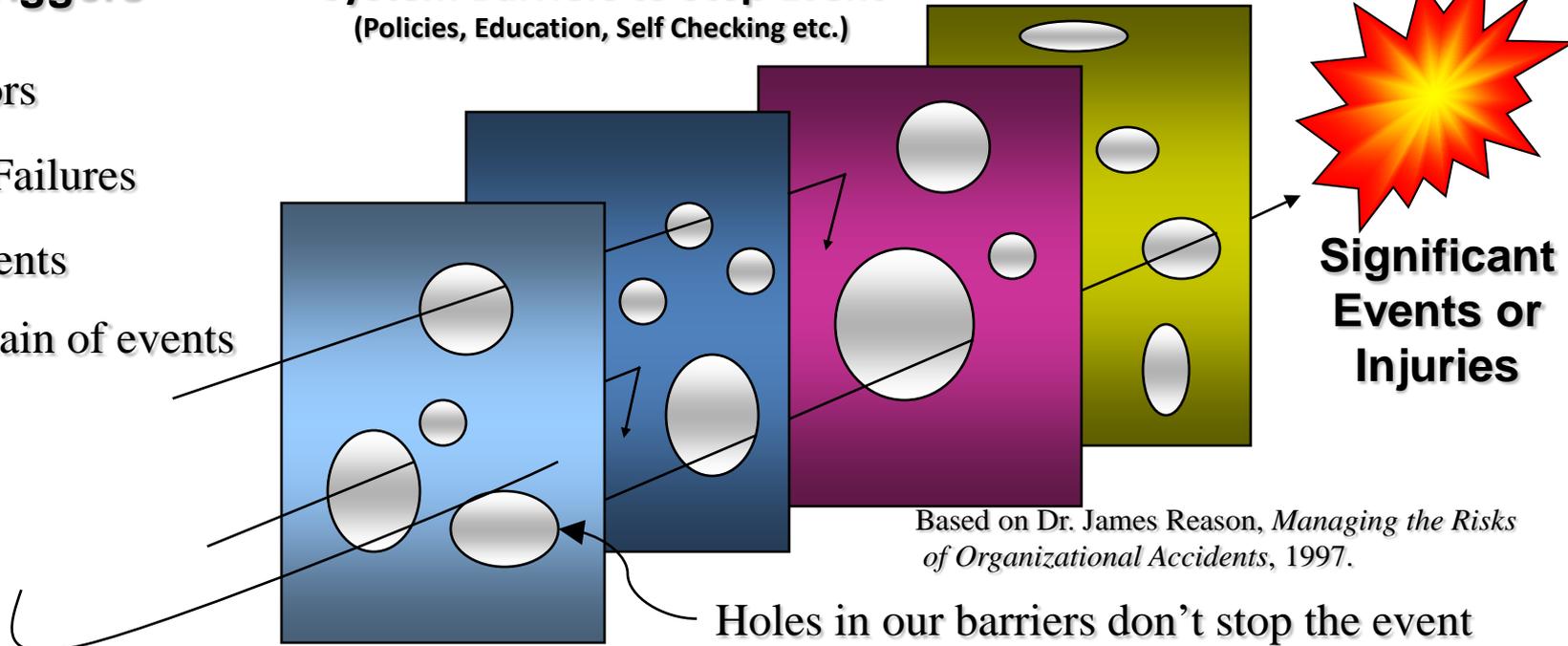
Why Do Events Happen?

Event Triggers

- Human Errors
- Equipment Failures
- External Events

Can start a chain of events

System Barriers to Stop Event (Policies, Education, Self Checking etc.)



Holes in our barriers don't stop the event

How many barriers are needed to prevent patient harm?

Reason: Systems & Accountability

- 5 Rights of Medication Administration
- Processes (eg, BMV, IV Smart Pumps)
- Critical Thinking (Nursing Process)

Professional Accountability

- **Licensure**
- **Authoritative bodies**
- **Commitment to safe patient care**
- **Mistake Happen:**
 - Fatigue
 - Cognitive bias
 - Workplace culture
 - Communication

Legal Issues: Failing to Use Available Technology

Five Elements Needed to Prove Any Type of Negligence

- 1) That there was a duty, a legally recognized relationship between the parties;
- 2) That there is a standard of care at issue, a required level of action or conduct;
- 3) That a breach of that duty occurred, failing to meet the requisite standard of care;
- 4) That the defendant's actions or conduct was the cause in fact and proximate cause of the plaintiff's harm;
- 5) That there were actual damages or injuries resulting the defendant's breach of their duty to act according to the standard of care.

A plaintiff must show that use of the specific available technology has become sufficiently widespread or readily available so that not using the technology would deviate from the generally accepted standard of reasonable care for nurses

1932 T.J. Hooper case

- This case is the benchmark for all technology negligence cases, including medical malpractice

Legal Issues: Massachusetts Cases

- A nurse's error resulted in civil litigation for the nurse, medical professionals in the chain of command, and the hospital.
- There is an expectation that all personnel involved in the caretaking of a patient will provide reasonable and skilled medical care and when a breach in that duty occurs by the actions of a nurse, the potential liability will run up the chain of the command all the way to the medical institution itself.
- The circle for potential civil liability targets is much larger than the nurse who may have breached the duty of care.

Legal Issues: Hypothetical

- Our speaker has described a rate of compliance that's very high, but not 100%. Assuming that the medications being administered are in the smart pump libraries, is 90% or 95% compliance with the use of the safety system sufficient?
- Once the technology is prevalent either in a particular locality or across the nation, any deviation from that technology is most likely negligence.
- Applying the reasonableness standard to this hypothetical, it may be viewed as highly unreasonable for a hospital to not have 100% usage rate of Smart Pump safety technology.

Legal Issues: Hospital Liability

Liability for an employer resulting from the actions of its employee is based upon agency theory liability

- Any employee acting on behalf of its employer is executing a principal-agent relationship, where the employer is the principal and the employee the agent.
- That authority exposes the hospital to liability when a nurse's actions, which are being conducted on behalf of the principal--the hospital, lead to the injury of a patient.

A hospital could potentially be liable if a nurse chooses not to use the Smart pump or other safer available technology

- Respondent Superior: An employer is liable to a third person for any injury which results proximately from tortious conduct of an employee acting within the scope of his or her employment.
- If it is deemed that the nurse breached a standard of care in not using the smart pumps within the scope of employment, the hospital employing the nurse would likely be vulnerable to a lawsuit.

Legal Issues: Standards of Care

The standard of reasonable care used for nurses in tort lawsuits is determined by the state law where the suit is filed.

- Twenty-nine states and Washington, District of Columbia, apply a national standard of care, meaning a nurse is expected to act with the general skill ordinarily found in the profession.
- Twenty-one states use a locality standard of care in which nurses are measured against the common nursing skill found in their local community or a similar location.

Determining a jurisdiction's appropriate standard of care at trial is usually established through the use of expert witnesses.

- Expert witnesses in these cases are often nursing professionals who provide testimony regarding the local standards of care including the available technologies and their use within the nurses' scope of practice.
- In appropriate standard of care cases where a technology is becoming more prevalent, courts are more likely to apply a national standard of reasonable care.

Legal Issues: Case Example and Malpractice Concerns

Alef v. Alta Bates Hospital

- Nurses monitored the fetal heart rate of a woman in labor using the auscultation method.
 - The court found that the nurses were negligent in failing to use the available electronic fetal monitoring because it would have detected the decelerations in heart rate, which may have prevented the brain damage to a newborn.
-
- **If the negligence was sufficiently severe resulting in serious, permanent injury or death, a nurse could be liable both civilly and criminal for their failure to use available technology**
 - **A malpractice insurance policy should never be seen as a safety net for failing to uphold your duty and responsibility as a medical provider**

Beyond “Be Careful”

- Science of safety is still young
- Advancing on learning curve with purposeful adoption of smart technologies and evidence-based practice
- Leadership is crucial
- Adoption of a Culture of Safety is KEY

Culture of Safety

- Corporate accountability for system design
- Managers accountable for facilitating safe behavioral choices with staff
 - Coaching at-risk behavior
- Frontline staff, middle managers, executives all accountable for safe behavioral choices

Systems Thinking vs Criminalization of Medical Error

“Eric Cropp’s incompetence goes far beyond conducting one reckless act. [He] consciously disregarded any and every set standard of protocol regarding patient safety.”

Kelly Jerry, Emily’s Mom



“I feel very sorry for the pharmacist... This guy is facing a prison sentence, and I know it was an accident.”

Chris Jerry, Emily’s dad



Systems Thinking vs Criminalization of Medical Error

- Stark contrast between heparin errors in Indianapolis and bupivacaine error in Wisconsin
- Need to build awareness of system based causes of error
 - Many barriers to safe care
- Incorporate principles of a just culture
 - Healthcare organizations
 - State boards

"Our systems are too complex to expect merely extraordinary people to perform perfectly 100 percent of the time. We must put in place systems to support safe practice and prevent harm to patients."

Jim Conway, quoted in "Nurses strengthen resolve to protect patients". Indianapolis Star, October 1, 2006 in response to an error that occurred in the community

Library Creation = Potential Barrier

Barrier Breakers:

- Standardization of formulary
- Clinical experts and prescribers
- Evidence informed references
- High level oversight (P&T)

Fine tuning IV smart pumps

- Listen to direct care nurses
- Involve an interdisciplinary team
- Eliminate unused therapies
- Evidence-based alarms
- Standardization
- Provide feedback – use the analytics

Goal

Prevent Catastrophic Patient Injury

- It will not be until interoperability between EMR, IV smart pumps, patient monitoring equipment, documentation, and direct care provider communication tools is fully created and implemented that most errors will be dramatically reduced.

Maximize Safety Benefits

- Establish and monitor utilization goals
- Analyze data
 - Use of the drug library
 - Dose alerts per drug
 - Dose overrides
 - Percent of infusions with overrides
 - Dose corrections
 - 999 mL/hr versus use of the bolus setting

Maximize Safety Benefits

- Actively share data at safety committees and with frontline staff
 - Importance of good catches
- Utilize data to make targeted improvements in drug library
 - Top alerts and overrides
- Actively engage users in data analysis
- Regularly update the pump library
- Provide necessary resources for library maintenance

ISMP Document

- “Effective approaches to Standardization and Implementation of Smart Pump Technology”:

<http://www.ismp.org/profdevelopment/SmartPumpTechnologyforwebce.pdf>

Interventions:

- Walking rounds
- Review the analytics from the IV smart pumps
- Post “saves” & give feedback
- Listen to direct care registered nurses
- Work with the Team
- Make changes to the therapy library prn
- Provide oversight
- Set goals

Questions??

**California Hospital
Engagement Network**

