DIDACTIC AND EXPERIENTIAL MEDICATION SAFETY ACTIVITIES FOR PHARMACY LEARNERS

Midwest Medication Safety Symposium

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Purdue University College of Pharmacy

DISCLOSURE

- No meaningful disclosures regarding potential conflicts regarding the content of this continuing education activity

ADDITIONAL DISCLOSURES

- No conflicts to disclose . . . . but a little about me

- Currently at Purdue University
  - Teach pharmacy students – patient safety, informatics, skills laboratory
  - Participation in funded grants as a subject matter expert
    - Opioid use disorder and patient transitions
  - Infusion pump related research
  - Served within Indianapolis Community as an MSO

- Other important roles

OBJECTIVES

- Describe the overall didactic and practical exercises offered at a college of pharmacy related to medication safety
- List two examples of medication safety related activities that could be used for learners on experiential based rotations
- Describe two medication safety habits that can be modeled for graduate and undergraduate learners

CONNECTION TO PURPOSE

ASHP REPORT

ASHP Statement on the Role of the Medication Safety Leader

- Originally published in 2013
  - Updated in 2019
- "Education" mentioned 15 times

Research and Education. To further research and education regarding medication safety, the medication safety leader will

6. Provide medication safety education to pharmacy colleagues, students, and residents, as well as other health care professionals.

Am J Health-Syst Pharm. 2020; 4:308-12

Patient Safety MOVEMENT

Actionable Patient Safety Solutions (APSS)

Patient Safety Curriculum

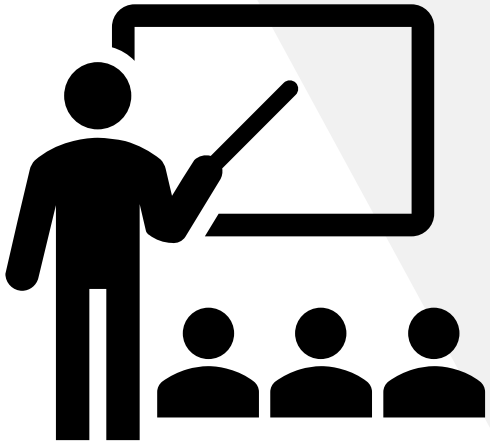
WHERE CAN IT BE USED?

The choice is yours! Resources are provided for classroom-based didactics, cases and videos to promote small group discussion, role play scenarios for skill development, as well as prompts for individual reflection.

Suggestions for opportunities in clinical settings to emphasize patient safety concepts are also offered.

STRUCTURE AND EXPERIENCE WITH PHARMACY LEARNERS

- What is a pharmacy learner?
  - P1 – P3 pharmacy student
  - APPE student (P4 students)
  - PGY1 and PGY2 pharmacy residents
  - Medication safety fellows



- Could a pharmacy learner also be . . .
  - Physician or nurse completing post graduate training
  - Health professions student
  - Researcher with an interest in health services
  - Pharmacy technician
  - Established pharmacist seeking continuing education

MY ROLE AT PURDUE WITH PHARMACY LEARNERS

Purdue University College of pharmacy (50%)

- Core classes within curriculum – Primarily P3 students
- APPE students on rotation – Med safety, academics and informatics
- Coordinate skills laboratory for pharmacy students
- Center for Medication Safety Advancement support and outreach
- Other duties as assigned

Regenstrief Center for Healthcare Engineering (50%)

- Serve as a resource pharmacist for research scientists within the center
- Advisor for the REMEDI dataset and work with Rich
- Provide pharmacist grant support for Purdue Healthcare Advisors
- Other duties as assigned

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PATIENT SAFETY AND INFORMATICS AT PURDUE – PHRM 868

- 3 hour core class at Purdue – 3rd year professional students
  - Modular based – 50% safety/50% informatics
  - Co-coordinate with Alissa Jara (formerly Alissa Russ)
  - Team taught with a variety of practice based speakers

- In-class activities
  - Medication error based case presentation
  - Completion of a Med-Watch Form
  - Skills lab focused on using LEAN methodology
    - Kyle Hultgren

PATIENT SAFETY AND INFORMATICS AT PURDUE – PHRM 868

Sample of Topics Covered

- The Pharmacist role in Medication Safety
- Medication Safety Terminology
- Error reporting and Regulatory Agencies
- Human Factors and High Reliability
- RCA/FMEA
- Clinician Burnout and Patient Safety
- First and Second Victims
- Patient and Families as Safety Allies
- PDSA/LEAN/Six Sigma

Table 1. Overview of assignments and points.

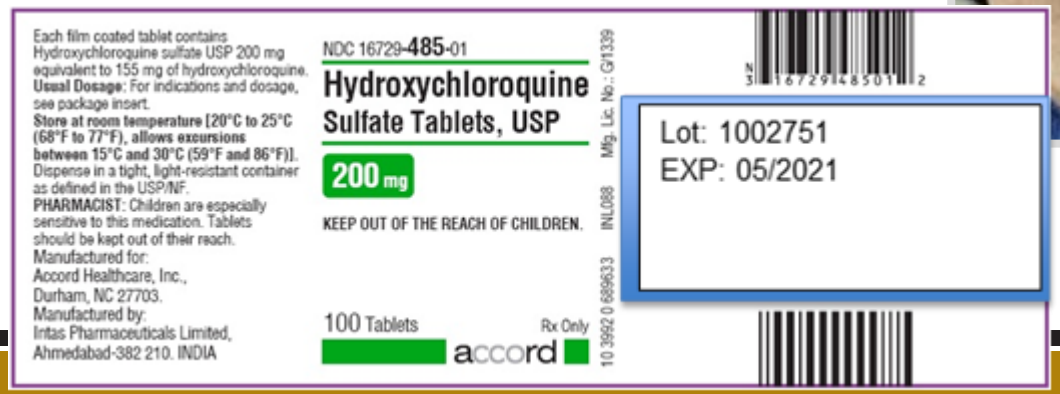
	Assignment	Total Points
1.	11 Patient Safety Online Modules (10 points each)	110
2.	Midwest Medication Safety Symposium*	30
3.	Quizzes (Parts I – III)	120
4.	MedWatch Report	60
5.	Patient Safety Project	150
6.	Summary Reflection	60
	Total Class Points	**530**

* Students may an alternative assignment if there is an unavoidable attendance conflict.

PATIENT SAFETY AND INFORMATICS AT PURDUE – PHRM 868

MedWatch Form Assignment

- Complete a form and reflection based on patient case
- Cases are based on real life reports
  - ISMP
  - AHRQ
  - Current events



Brief Description
Current Medications
Narrative/Pictures
Product Packaging
Provider statements

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EXAMPLE OF MED SAFETY ACTIVITY FOR EXPERIENTIAL LEARNERS

- Institute for Healthcare Improvement Open School
  - Basic Certificate in Quality and Patient Safety
  - 13 online modules to receive certificate
  - No cost to health profession educators or students
  - Combination of videos from national leaders and reading material

- Repeatable research or quality project
  - Project which a new learner can step into and follow a set of instructions
  - Organization learns something new based on data
  - Learner is able to present findings

IHI OPEN SCHOOL CERTIFICATE

- Provides context for deeper discussions
- Gives meaning to future experiences
- CV Builder for learner

IHI Open School Online Courses

Improvement Capability	Patient Safety
QI 101: Introduction to Health Care Improvement	**PS 101:** Introduction to Patient Safety
QI 102: How to Improve with the Model for Improvement	**PS 102:** From Error to Harm
QI 103: Testing and Measuring Changes with PDSA Cycles	**PS 103:** Human Factors and Safety
QI 104: Interpreting Data: Run Charts, Control Charts, and Other Measurement Tools	**PS 104:** Teamwork and Communication in a Culture of Safety
QI 105: Leading Quality Improvement	**PS 105:** Responding to Adverse Events
Triple Aim for Populations	**Person- and Family-Centered Care**
TA 101: Introduction to the Triple Aim for Populations	**PFC 101:** Introduction to Person- and Family-Centered Care
Leadership	
L 101: Introduction to Health Care Leadership	

REPEATABLE PROJECT FOR LEARNERS

- What is the process for making a project repeatable?
  - Start with a standardized, available dataset
  - Develop a step by step manual for the project
    - Should be evolved by those completing the project
  - Electronic tools to allow for quick acclimation
  - Clear research goal with limited change in variables
  - A finished product to evaluate progress (knowing what “good” looks like”)

REPEATABLE PROJECT FOR LEARNERS

Needs for a repeatable project

- A standardized, available dataset
- A step by step manual for the project evolved by those completing the work
- Electronic tools to allow for quick acclimation
- Clear research goal with limited change in variables
- A finished product to evaluate progress (knowing what “good” looks like”)

Requirements for a repeatable project

- Meaningful - will provide insight for practitioners, researchers or others
- Reproducible - stepwise process used by multiple individuals by changing only one or two variables
- Efficient – can be completed in a 4 to 6 week block of time with guidance
- Learning Focused – the learner will gain meaningful skills

CAN A REPEATABLE PROJECT BE DEVELOPED FOR THE REMEDI DATASET?

- What is the REMEDI dataset?

CAN A REPEATABLE PROJECT BE DEVELOPED FOR THE REMEDI DATASET?

Contents lists available at ScienceDirect

Research in Social and Administrative Pharmacy

journal homepage: www.elsevier.com/locate/rsap

High-alert medication administration and intravenous smart pumps: A descriptive analysis of clinical practice

Kathryn K. Marwitz[a,*], Karen K. Giuliano[b], Wan-Ting Su[c], Dan Degnan[d], Richard J. Zink[e], Poching DeLaurentis[e]

- Reviewed data from 2016 for 17 hospital systems
- All systems had reported data in the system
  - Identified 36 common drugs among 15 of the systems
  - 19 high alert meds and 17 non-high alert meds

Needs for repeatable project

- **Standardized, available dataset**
- **Step by step manual**
- **Electronic tools**
- **Clear research goals**
- **A finished product**

CAN A REPEATABLE PROJECT BE DEVELOPED FOR THE REMEDI DATASET?

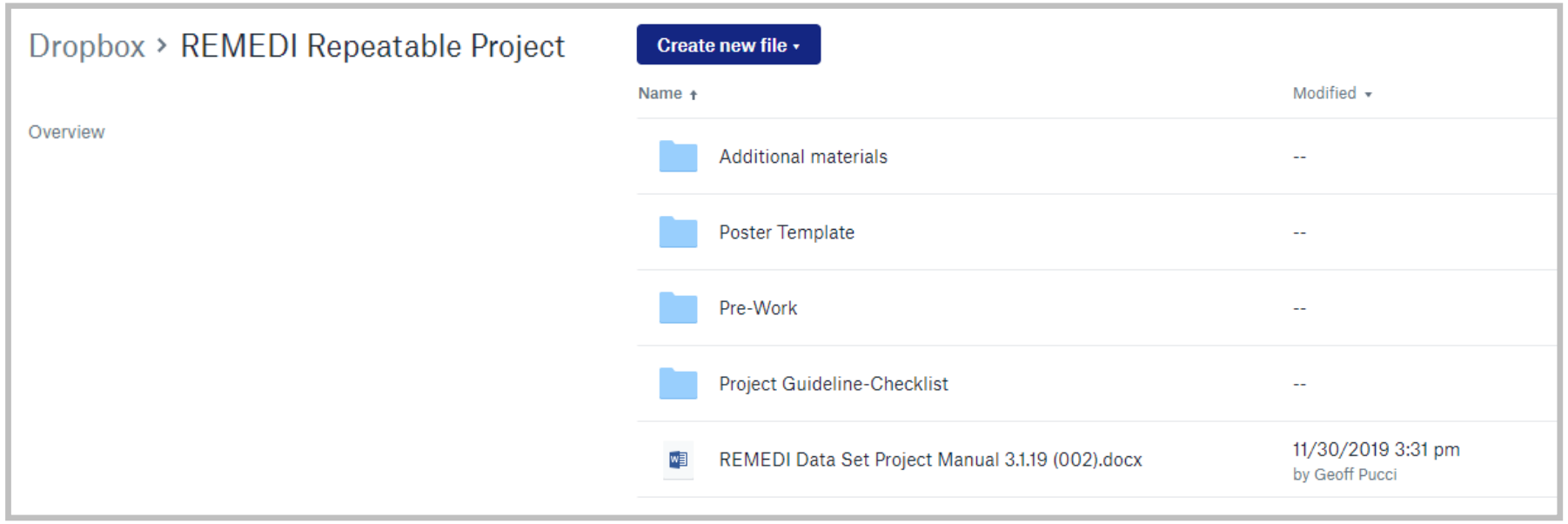
- Obtain access to the REMEDI system
- Project manual including screenshots
- Stepwise checklist for project completion
- Slide decks describing how to collect data from various parts of the system

Needs for repeatable project

- ✓ **Standardized, available dataset**
- **Step by step manual**
- **Electronic tools**
- **Clear research goals**
- **A finished product**

CAN A REPEATABLE PROJECT BE DEVELOPED FOR THE REMEDI DATASET?

- Electronic tools to acclimate quickly
  - Standardized data collection sheet
  - Video of didactic lecture on Smart Pumps
  - Dropbox like storage of instructions



Needs for repeatable project

- ✓ Standardized, available dataset
- ✓ Step by step manual
- Electronic tools
- Clear research goals
- A finished product

CAN A REPEATABLE PROJECT BE DEVELOPED FOR THE REMEDI DATASET?

- Develop a list of goals for the project

1. To create a repeatable research opportunity for fourth-year pharmacy students, which focuses on using quantitative measurements from the REMEDI database
2. To perform and evaluate data analysis on different library settings of smart pumps by looking at things such as soft or hard stops, alerting practices, and compliance analysis.
3. To compare the project findings and national practice recommendations when using smart IV pumps to obtain an increased understanding of healthcare practice.

Needs for repeatable project

- ✓ **Standardized, available dataset**
- ✓ **Step by step manual**
- ✓ **Electronic tools**
- • **Clear Research Goals**
- • **A finished product**

Review of propofol use and infusion pump settings across a national hospital dataset

Geoffrey J Pucci, PharmD Candidate, Daniel D Degnan, PharmD, MS, CPPS, FASHP, College of Pharmacy, Richard J Zink, MBA, Regenstrief Center for Healthcare Engineering

PURDUE COLLEGE OF PHARMACY

Regenstrief Center for Healthcare Engineering

PURDUE UNIVERSITY

Introduction

High-alert medications (HAM) are drugs that pose a heightened risk for patient harm if an error occurs. Smart infusion pumps are equipped with key features to help reduce programming errors, protect patients from harm, and assist clinicians in efforts to prevent medication errors. Features utilized by smart infusion pumps may include Dose Error Reduction System (DERS), best practice guidelines per drug, calculation and dosing checks, a report system of clinician response, and dose limit alerts. The purpose of this project was to compare and contrast the use of propofol with smart infusion pumps across hospitals using a shared dataset. The study compared the findings to published best practices, smart pump vendor guidelines, and notices from applicable professional organizations to determine the prevalence of these recommendations in practice.

Methods

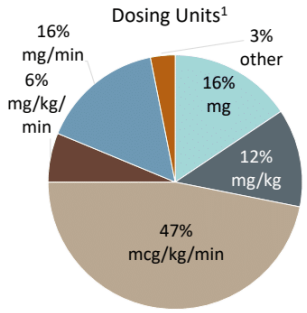
Cross Reference ISMP and REMEDI → Compare List to ASHP S4S → Identify common medication list → Choose Propofol to study → Complete analysis of thirteen health-systems

A common medication list was created by comparing high-alert medications from the ASHP S4S list, ISMP HAM list, and the REMEDI dataset. Once a list of common medications was identified, propofol was then selected to be studied. Analysis of thirteen health-systems was then completed using the REMEDI dataset.

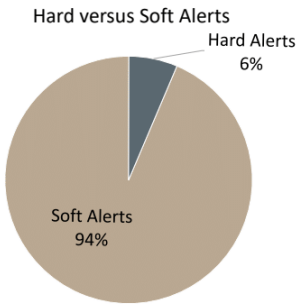
Results

Standardize 4 Safety	ISMP	REMEDI
	Amiodarone	Amiodarone
Diltiazem	Antiarrhythmics	Diltiazem
Dobutamine	Inotropic agents	Dobutamine
Dopamine	Inotropic agents	Dopamine
Epinephrine	Epinephrine	Epinephrine
Fentanyl	Opioids	Fentanyl
Heparin	Heparin	Heparin
Insulin	Insulin	Insulin
	Magnesium sulfate	Magnesium sulfate
Morphine	Opioids	Morphine
Norepinephrine	Norepinephrine	Norepinephrine
	Oxytocin	Oxytocin
Phenylephrine	Phenylephrine	Phenylephrine
	Potassium chloride	Potassium chloride
	Potassium phosphate	Potassium phosphate
Propofol	Propofol	Propofol
	Chemotherapeutics	Rituximab
	Sodium chloride	Sodium chloride

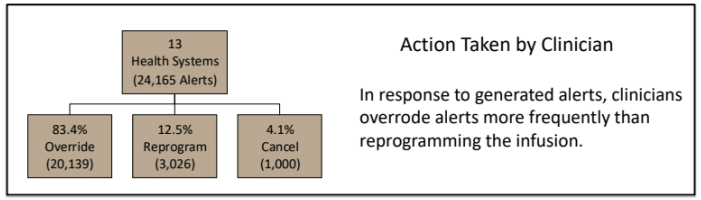
The table above maps high-alert medications across the ASHP S4S list, ISMP HAM list, and the REMEDI dataset.



[1]ASHP recommends dosing units be in mcg/kg/min. www.ashp.org/Pharmacy-Practice/Standardize-4-Saftety-Initiative.



The ratio of soft alerts to hard alerts showed that 14.6 soft alerts were generated for every hard alert.



Continuous Infusion Limits (mcg/kg/min)	Soft Min.	Soft Max.	Hard Max.
San Diego Patient Safety Council Recommendation[2]			
	0.01	80	100
Current REMEDI Analysis			
Count (n)	13	14	11
Mean	2.9	99.7	152.7
Median	2	99.5	150
Mode	5 (n=5)	100 (n=5)	200 (n=4)
Largest	5	200	250
Smallest	0	51	0

The table above shows an analysis of drug library entries for propofol using units of mcg/kg/min.

Note the discord between current practice and recommended dosing limits.

[2]San Diego Patient Safety Council (SDPSC). High-risk IV medications dosing limits guidelines of care 2012. https://www.hqinstitute.org/sites/main/files/file-attachments/sdpsc_high-risk_iv_med_dosing_limits_tool_kit_.pdf

Discussion

- High rates of alert overrides may suggest unnecessary clinician effort and alert fatigue
- Less than 50% of propofol drug library entries followed the S4S dosing unit recommendation
- More than half (57%) of the propofol drug library entries for soft minimum limits were higher than the SDPSC recommendation
- 82% of the propofol drug library entries for hard maximum limits were higher than the SDPSC recommendation
- The ratio of soft alerts to hard alerts may suggest inappropriate alert status, alert fatigue, or unnecessary clinician effort

Conclusion

This analysis shows variation of propofol infusion pump administration practice among the health-systems compared and a varying degree of alignment between clinical practice recommendations for dosing propofol. A follow-up study could provide a better understanding of discrepancies across multiple health-systems. This project has laid a foundation for a repeatable research activity for student pharmacists and pharmacists leveraging the REMEDI database to analyze high alert medications to understand their current use in practice

REMEDI CENTRAL

PURDUE UNIVERSITY

Needs for repeatable project

- Standardized, available dataset
- Step by step manual
- Electronic tools
- ✓ Clear Research Goals
- A finished product

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MEDICATION SAFETY HABITS

- Conduct safety huddles
- Persuade others through storytelling
- Actively seek out learning about medication safety
- Be approachable by lowering the authority gradient
- Ask clarifying questions
- Develop a personal work environment based on QI principles
- Defer to expertise and resist the temptation to oversimplify
- Be an example of your organization’s safety culture

TIME TO SHARE

Use the chat box . . . . .

Please share one activity that you complete either formally or informally with a learner that promotes medication safety

THANK YOU

"It started out slow, but it really picked up by the end."

Questions?