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Sample Medication Safety
APPE Student Rotation

Rotation Description

The medication safety rotation will help students become familiar with the key principles utilized in hospitals and health systems to improve medication safety. The rotation is designed to expose students to medication safety nomenclature, key principles, tools and available resources. The student will participate in several activities designed to improve the student's working knowledge and experience with medication safety concepts. The rotation will enable the student to apply knowledge in any pharmacy practice setting to improve medication safety for patients.

Goals and Objectives

The preceptor and student should agree on which goals and objectives are appropriate for the rotation based on rotation site, rotation objectives delineated by pharmacy school, rotation length and student interests. The following are a list of potential goals and objectives:

1. Develop an understanding of the systems-based approach to improving medication-use safety.
2. Explain why error reporting is so vital to improving medication safety. Describe types of error reporting systems that exist. Describe the NCC-MERP medication error classification schema. Explain methods used to investigate and analyze root causes of medication errors, how to develop effective risk reduction strategies, and how to prioritize action items. Participate in the institution's error tracking system. Describe how errors are reported, investigated and resolved. Explain the quality improvement process associated with identified errors.
3. Describe methods to identify organizational medication safety risk (e.g., self-assessments, error reports, trigger methodology). Identify risk reduction strategies and delineate effectiveness of various strategies.
4. Explain why certain medications are termed "high alert medications". Describe risk reduction strategies that can be used to prevent harm from high alert medications and other medications
5. Summarize Joint Commission National Patient Safety Goals (NPSGs) designed to improve medication-use safety, such as: NPSG 3 (safe anticoagulant use) and NPSG 8 (medication reconciliation).
6. Describe methods and tools, such as Root Cause Analysis (RCA), Failure Modes and Effects Analysis (FMEA) and Lean Sigma, used to improve medication safety.
7. Describe the concept of "Culture of Safety". Compare and contrast punitive, blame-free and just cultures.
8. Describe select technologies that are employed to improve medication-use safety. Discuss the benefits and pitfalls of these technologies.
9. Compare medication safety resources, such as: the Institute for Safe Medication Practices (ISMP), American Society for Heath-Systems Pharmacists (ASHP), Agency for Healthcare Research and Quality (AHRQ), and the Institute for Healthcare Improvement (IHI).

Activities

During the course of the rotation, the student should participate in some of the following activities as assigned by preceptor:

1. Watch at least one of the following videos and discuss impression with the preceptor:
    a. Beyond Blame video
    b. Chasing Zero: Winning the War on Health Care Harm
2. Complete orientation to organization's pharmacy operations and clinical activities. The student will spend time (e.g., one week) working with pharmacy technicians in pharmacy operations and shadowing clinical pharmacists working on the nursing units. The student will provide a written summary of daily activities that should include (at a minimum) answers to the following questions:
    a. Describe *differences* noticed between organization's practice and practices you have been exposed to previously.
    b. Describe *similarities* between organization's practice and practices you have been exposed to previously.
    c. Describe unsafe/risky practices you witnessed during observation.
    d. Describe safe practices you witnessed during observation.
    e. Provide any suggestions for process improvements to improve medication safety.
3. Participate in daily medication error review with preceptor and independently analyze and present at least one medication error case presentation to medication safety committee (or other appropriate committee or group of peers or clinicians). For reported medication errors that are relevant for submission to ISMP and/or FDA, gather any additional information that is needed and submit the report to the appropriate agency. Answer any requests for follow-up information that are received in a timely fashion.
4. Complete a medication-safety related journal article review and present during rotation.
5. Read all ISMP Medication Safety Alerts® published during rotation. Compile a summary of the MSA listing issues affecting the hospital and potential risk reduction strategies that should be considered for implementation.
6. Review patient safety resources
    a. ISMP website
    b. ISMP consumer website
    c. ASHP website
        i. Sections on patient safety and quality improvement initiatives
        ii. Safety Series webinars created by ASHP's Medication Safety SAG
    d. AHRQ Patient Safety Net
    e. The Joing Commission website, sections on hospitals and NSPGs
    f. NCC-MERP website, sections on medication errors, definitions, category index, taxonomy, dangerous abbreviations, and about "NCC-MERP"
    g. IHI website
        i. Open School (free for students)
        ii. Medication Systems section
    h. FDA website
        i. FDA Patient Safety News
        ii. FDA Drugs
        iii. FDA Medwatch
    i. National Quality Forum (NQF)

7. Spend one day shadowing a nurse on a patient care unit. Observation activities should include: medication administration, (smart) pump programming, documentation on (electronic) medication administration record (MAR), use of and issues associated with automated dispensing cabinets (ADCs) and bar code at the point of care (BPOC). The student should note safe practices, unsafe practices, teamwork and communication issues, workflow issues (e.g., distractions and interruptions, missing medications) and opportunities for pharmacy to help improve safety. The student should provide a written summary of the experience and present to pharmacy staff.
8. Read necessary/assigned materials and be prepared to discuss with the preceptor during topic discussions. Prepare and lead at least one topic discussion on a relevant medication-safety related topic.
9. Attend all assigned pharmacy and interdisciplinary meetings relative to medication safety, such as:
    a. Medication Safety Committee
    b. P&T Committee
    c. Quality Improvement Committee
    d. Risk Management Committee (e.g., medication-related RCA or FMEA meetings)
    e. Patient Safety Committee
    f. Medication Safety Taskforces (e.g., hypoglycemia, anticoagulation, falls, etc.)
10. Complete other projects as assigned by preceptor.

Topic Discussions

As time permits, preceptors should schedule time when they can discuss various topics with the student. Background readings should be provided when available (some suggested readings listed with topics in this section). The student should be expected to lead at least one topic discussion towards the end of the rotation.

Potential Topics

Automated dispensing cabinets (ADCs)	✓ ISMP Medication Safety Self Assessment for Automated Dispensing Cabinets ✓ ASHP Guidelines on the Safe Use of Automated Medication Storage and Distribution Devices
Complex Systems Theory	✓ Leape, LL. (2007). Systems analysis and redesign: the foundation of medical error prevention. In M. Cohen. Medication Errors (pp. 3 – 14). Washington D.C: American Pharmacists Association. ✓ (IHI) PS 101: Fundamentals of Patient Safety, Lesson 1: To Err is Human ✓ (IHI) PS 101: Fundamentals of Patient Safety, Lesson 4: Error versus Harm
Failure Modes and Effects Analysis (FMEA)	✓ Cohen M., et al (2007). Healthcare failure mode and effects analysis chapters. Medication Errors (pp. 561 - 586). Washington D.C: American Pharmacists Association ✓ VA NCPS
High Alert Medications	✓ Cohen, M, et al. (2007). High alert medications: safeguards against errors. In M. Cohen. Medication Errors (pp. 317 - 412). Washington D.C: American Pharmacists Association. ✓ IHI website resources (100 million lives campaign)
Human Factors Engineering Principles	✓ Human Factors Engineering Series: Joint Commission Journal on Quality and Patient Safety ▪ Gosbee J. Jt Comm J Qual Saf. 2004 Apr;30(4):215-9. ▪ Gosbee LL. Jt Comm J Qual Saf. 2004 Apr;30(4):220-3. ▪ Gosbee J. Jt Comm J Qual Saf. 2004 May;30(5):282-5. ▪ Gosbee J. Jt Comm J Qual Saf. 2004 Dec;30(12):696-700. ✓ Mary Burkharts chapter from ASHP safety book (2005) ✓ (IHI) PS 102: Human Factors and Safety (3 modules)

Institute for Healthcare Improvement	✓ ADE Trigger Tool ✓ 5 million lives campaign, etc
IOM reports	✓ Err is Human, Crossing the Quality Chasm, Preventing Medication Errors Executive Summaries ✓ (IHI) PS 100: Introduction to Patient Safety, Lesson 1: Understanding Medical Error and Patient Safety
Just Culture	✓ Just Culture Community ✓ ISMP newsletter articles (part 1&2) ✓ Smetzer, J. (2007). Managing medication risks through a culture of safety. Medication Errors (pp. 605 - 654). Washington D.C: American Pharmacists Association ✓ (IHI) PS 101: Fundamentals of Patient Safety, Lesson 3: Responding to Error ✓ (IHI) PS 100: Introduction to Patient Safety, Lesson 3: A Call to Action – What can you do ✓ Patient Safety and the "Just Culture": A Primer for Health Care Executives, April 17, 2001 Prepared by David Marx, JD
Lean and Six Sigma Methodologies	✓ IHI white paper: Going Lean in Healthcare ✓ Hintsen B., et al. Am J Health-Syst Pharm**.** 2009; 66:2042-7
Look-Alike/Sound-Alike(LASA) medications	✓ Cohen, M. (2007). Role of drug packaging and labeling in medication errors. In M. Cohen. Medication Errors (pp. 87 - 110). Washington D.C: American Pharmacists Association ✓ ISMP website list ✓ TJC MMS
Measuring Safety (e.g., chart review, triggers tool, observation, etc)	✓ Meyer-Massetti, et al. "Systematic review of medication safety assessment methods." Am J Health-Syst Pharm. 2011; 68:227-40.
Medication Error reporting systems (voluntary and mandatory)	✓ Smetzer, J., Cohen M. (2007). Medication error reporting systems. In M. Cohen. Medication Errors (pp. 513 - 550). Washington D.C: American Pharmacists Association ✓ NCC-MERP website ✓ MedMARX website ✓ (IHI) PS 101: Fundamentals of Patient Safety, Lesson 2: Identifying and Reporting Errors ✓ (IHI) PS 101: Fundamentals of Patient Safety, Lesson 3: Responding to Error
Root Cause Analysis (RCA)	✓ VA NCPS website ✓ Cohen, M., et al (2007) Medication Errors. Root Cause Analysis of Medication Errors Chapter 5.
"Smart" Infusion and PCA Pumps	✓ Proceedings from the ISMP Summit on the use of SMART Infusion Pumps: Guidelines for safe implementation and use ✓ Patient-Controlled Analgesia: Making It Safer for Patients, Michael R. Cohen, RPh, MS, ScD, ISMP. ✓ Smetzer J., Cohen M. (2007). Preventing errors related to drug delivery devices. In M. Cohen. Medication Errors (pp. 275 - 288). Washington D.C: American Pharmacists Association
Teamwork and communication	✓ (IHI) PS 103: Teamwork and Communication (3 modules)
Use of automation and technology	✓ Grissinger M, et al. (2007). Using technology to prevent medication errors. In M. Cohen. Medication Errors (pp. 413 - 444). Washington D.C: American Pharmacists Association ✓ ASHP: Automation and IT Policy ✓ Leapfrog ✓ High profile papers (HUP paper 2005)

Additional Topics

ASHP Best Practice for Preventing Medication Errors and Cancer Chemotherapy
CMS Quality Indicators and Core Measures (website)
Development of standard IV concentrations
Error Disclosure
FDA medwatch bulletins
Guidelines for preventing medication errors in pediatrics (PPAG/ISMP)
ISMP key elements of the medication use process
Medication Error Review Methods (e.g., ISMP Assess-Err®)
Medication Safety Assessments (e.g., ISMP self assessments – Hospital, Bar code, ADCs, Anticoagulation)
National Patient Safety Goals
Role of a medication safety officer / specialist / manager
Second Victim Theory
TJC Sentinel Event Alerts

Projects

The student should complete at least one longitudinal medication safety project. Preceptor and student should choose a project during the second week of rotation (see example projects listed below). Some projects listed may be more appropriate for students on extended-length (e.g., several months in length) rotations, which should be considered when determining project(s) to be completed. Student should present findings / deliverables to the appropriate audience during the rotation.

Potential Projects

1. Describe what a high alert medication is. Describe risk reduction strategies used at the hospital to prevent harm from high alert medications. Perform a compliance audit for one risk reduction strategy used at the hospital.
2. Develop materials and educate staff on risk reduction strategies for High Alert or Look-alke/sound-alike (LASA) Medications.
3. Complete gap analysis for recent ISMP quarterly action update.
4. Review the National Patient Safety Goals. Choose one goal and perform an in depth review of the pharmacy practice pertaining to that goal. With the help of the preceptor, make suggestions for how the pharmacy can better achieve the goal.
5. Participate in FMEA, RCA or ADE surveillance.
6. Perform observational audit of a pharmacy work process and report results. Examples include: gowning and garbing practices, hand washing practices, independent double checks, medication storage, IV preparation process, chemotherapy dispensing process, bedside bar-code medication administration compliance, etc.
7. Review pharmacy and automated dispensing cabinet storage and labeling of high alert and LASA medications.Make suggestions for improvements to labeling and storage.
8. Review ADC alerts and overrides. Make suggestions for maximizing alert effectiveness and minimizing drug overrides.
9. Perform an analysis of reported medication errors by medication, error type, node, etc. Identify trends and systems issues that need to be corrected.
10. Use a risk identification method, such as chart review for triggers or analysis of pharmacist interventions, to identify areas for medication safety improvement.
11. Complete a specific ***section*** of the ISMP self assessment for the organization. Alternatively, for organizations that complete the assessment yearly, perform a gap analysis based on the most recently completed assessment. Choose 1 or 2 items and develop a plan to achieve the goal.

12. Select a high risk process and conduct a failure modes and affects analysis. Identify 1 or 2 high risk steps and implement risk reduction strategies **.**
13. Follow a select high alert medication through the entire medication use process (e.g., insulin or heparin) from the prescribing phase, dispensing phase, administration phase and monitoring phase to identify areas of risk. Suggest reduction strategies for implementation to addresss the identified deficiencies.
14. Review a recent Joint Commission sentinel event alert, complete a gap analysis and select 1 or 2 initiatives to improve medication safety.
15. Assist preceptor in development of a safety webinar/podcast with ASHP.
16. Write a summary analysis differentiating "quality" from "safety" to give student a baseline understanding of the key differences between both these concepts/areas of practice.

Evaluation

The preceptor will evaluate the student on achievement of the predefined goals and objectives for the rotation. Students will also be asked for any specific personal goals for the rotation. Students will also be evaluated on their interactions with pharmacists and pharmacy technicians from the Organization's Pharmacy, as well as daily discussions with the preceptor concerning reported medication errors and discussion topics. The evaluation will include an oral mid-point evaluation to assess progress. The preceptor and student will complete a final written evaluation at the conclusion of the rotation according to school of pharmacy criteria.

Acknowledgements

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The tool content was reviewed by the 2010-2011 SICP – SAG on Medication Safety members and then mapped against ACPE Guidelines by 2011-2012 SICP SAG-Pharmacy Practice members.

Website Resources

Agency for Healthcare Research and Quality: Patient Safety Net	**www.psnet.ahrq.gov**

American Society of Health-Systems Pharmacists	**www.ashp.org**
ASHP Best Practice for Preventing Medication Errors and Cancer Chemotherapy	www.ashp.org/Import/PRACTICEANDPOLICY/PolicyPositionsGuidelinesBestPractices/BrowsebyTopic/MedicationMisadventures.aspx
ASHP: Automation and IT Policy	www.ashp.org/Import/PRACTICEANDPOLICY/PolicyPositionsGuidelinesBestPractices/BrowsebyTopic/Automation.aspx
Safety Series webinars created by ASHP's Medication Safety SAG	www.ashp.org/Import/MEMBERCENTER/Sections/Webinars.aspx

Center For Medicare & Medicaid Services	**www.cms.gov**
CMS Quality Indicators and Core Measures	www.cms.gov/HospitalQualityInits/01_Overview.asp

Institute For Healthcare Improvement	**www.IHI.org**
5 million lives campaign	www.ihi.org/IHI/Topics/PatientSafety/MedicationSystems/
IHI white paper: Going Lean in Healthcare	www.ihi.org/IHI/Results/WhitePapers/GoingLeaninHealthCare.htm
Medication Systems	www.ihi.org/IHI/Topics/PatientSafety/MedicationSystems/
Open School (free for students)	www.ihi.org/IHI/Programs/IHIOpenSchool/Course+Catalog.htm

Institute For Safe Medication Practices	**www.ismp.org**
ISMP Consumer	www.consumermedsafety.org
ISMP Medication Safety Self Assessment for Automated Dispensing Cabinets, Hospital, Bar Code…	www.ismp.org/selfassessments/default.asp
ISMP newsletter articles (part 1&2)	www.ismp.org/Newsletters/acutecare/articles/20060907.asp?ptr=y www.ismp.org/Newsletters/acutecare/articles/20060921.asp?ptr=y
Medication Error Review Methods (e.g., ISMP Assess-Err®)	www.ismp.org/Tools/AssessERR.pdf
Guidelines for preventing medication errors in pediatrics (PPAG/ISMP)	www.ismp.org/Newsletters/acutecare/articles/20020601.asp
Proceedings from the ISMP Summit on the use of SMART Infusion Pumps: Guidelines for safe implementation and use	www.ismp.org/tools/guidelines/smartpumps/comments/printerVersion.pdf

International Center for Health Outcomes and Innovation Research	**www.mers-tm.org**
Patient Safety and the "Just Culture": A Primer for Health Care Executives, April 17, 2001 Prepared by David Marx, JD	www.safer.healthcare.ucla.edu/safer/archive/ahrq/FinalPrimerDoc.pdf

National Center For Medication Safety	**www.patientsafety.gov/index.html**
Vision	www.patientsafety.gov/vision.html
VA NCPS Resources	www.va.gov/ncps/SafetyTopics/HFMEA/HFMEAIntro.pdf www.va.gov/ncps/SafetyTopics/HFMEA/FMEA2.pdf www.va.gov/ncps/CogAids/RCA/index.html

National Coordinating Council For Medication Error Reporting and Prevention	**www.nccmerp.org**

National Quality Forum	**www.qualityforum.org/Home.aspx**

The Joint Commission	**www.jointcommission.org**
TJC Sentinel Event Alerts	www.jointcommission.org/sentinelevents/sentineleventalert/
TJC: National Patient Safety Goals	http://www.jointcommission.org/standards_information/npsgs.aspx

The Just Culture Community	**www.justculture.org**

The LEAPFROG Group	**www.leapfroggroup.org**
Bibliography: Computer Physician Order Entry (CPOE)	www.leapfroggroup.org/media/file/cpoe_bibliography.pdf
Factsheet: Computer Physician Order Entry (CPOE)	www.leapfroggroup.org/media/file/FactSheet_CPOE.pdf

U.S. Food and Drug Administration	**www.fda.gov**
FDA Drugs	www.fda.gov/Drugs/default.htm
FDA Medwatch	www.accessdata.fda.gov/scripts/medwatch/medwatch/medwatch-online.htm
FDA Medwatch Bulletins	www.fda.gov/Safety/MedWatch/default.htm
FDA Patient Safety News	www.accessdata.fda.gov/scripts/cdrh/cfdocs/psn/index.cfm

Miscellaneous References	
Chasing Zero: Winning the War on Health Care Harm	http://dsc.discovery.com/videos/cme-chasing-zero-preview.html
To Err is Human, Crossing the Quality Chasm, Preventing Medication Errors Executive Summaries	www.nap.edu/openbook.php?isbn=0309068371