Medication Safety: Protection Versus Production
Kevin Hope, RPh

Live Activity Handout
4 slides per page
Medication Safety: Protection Versus Production

ACTIVITY DESCRIPTION
Healthcare teams boast unprecedented resources and tools for reduction in medication error. Despite staggering technological advances, errors continue. In fact, new opportunities for error have emerged with some of the very tools intended to eliminate systematic errors. Using established psychological principles, human engineering factors are examined and extrapolated to the unique challenges of the contemporary pharmacy setting. Recurring problematic areas in pharmacy practice will be extensively examined within the framework of an effective Continuous Quality Improvement (CQI) Plan and appropriate use of the Root Cause Analysis (RCA) method in identifying, reporting, and evaluating sentinel events. The vitality of intra- and inter-professional communications is emphasized throughout the didactic structure of this presentation.

This activity satisfies the requirements for Florida Medication Errors for PHARMACISTS and PHARMACY TECHNICIANS only.

TARGET AUDIENCE
The target audience for this activity is pharmacists, pharmacy technicians, and nurses in hospital, community, and retail pharmacy settings.

LEARNING OBJECTIVES
After completing this activity, the pharmacist will be able to:

- Identify tools and models for error reduction and patient safety advocacy
- Recognize the most significant contraindications and medication interactions for a variety of patient populations
- Describe the elements and common players in conducting an effective Root Cause Analysis (RCA)
- Identify error prone abbreviations from ISMP’s “Do Not Use” list

After completing this activity, the pharmacy technician will be able to:

- Identify tools and models for error reduction and patient safety advocacy
- Recognize the vitality of workplace culture in the implementation of an effective Continuous Quality Improvement (CQI) plan
- Describe the elements and common players in conducting an effective Root Cause Analysis (RCA)
- Identify error prone abbreviations from ISMP’s “Do Not Use” list

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Kevin has received several professional awards, including the Pfizer Leadership Award and the Innovative Pharmacy Practice Award from the South Carolina Pharmacy Association. Having served as a corporate communications trainer for Triad Isotopes, Kevin has presented to a variety of audiences, including a nuclear pharmacy symposium at the American Pharmacists Association annual meeting. Kevin has served as an independent editor for several Paradigm Publishing textbooks, and currently serves on the professional advisory board for Paradigm Publishing. Kevin’s passions lie in helping students achieve and surpass personal educational goals.

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Objectives

• Identify tools and models for error reduction and patient safety advocacy
• Recognize the most significant contraindications and medication interactions for a variety of patient populations
• Recognize the vitality of workplace culture in the implementation of an effective Continuous Quality Improvement (CQI) plan
• Describe the elements and common players in conducting an effective Root Cause Analysis (RCA)
• Identify error prone abbreviations from ISMP’s “Do Not Use” list

Professional Focus On Patient Safety

• ACPE: “subject of medication safety be adequately addressed within the scope of pharmacy collegiate curricula”
• ASHP: included “educational outcome studies related to medication safety”
• Continuing Education Requirements
• Credentialing Programs:
  • American Society of Medication Safety Officers (ASMSO) designation of the BCMSS credential (Board Certified Medication Safety Specialist)
  • National Association for Healthcare Quality’s designation of Certified Professional in Healthcare Quality (CPHQ)

How accurate are we?

• Overall dispensing accuracy rate in community pharmacy is ~ 98.3%
• 4 errors per day in a pharmacy filling 250 prescriptions daily.
• 51.5 million errors occur during the filling of 3 billion prescriptions annually in America’s pharmacies.
Challenges of Data Analysis

Causes of death are reported using codes from the International Classification of Diseases (ICD).
• Those causes not associated with an ICD code - namely, medical errors - are not captured.
• Medical errors will never be listed on the CDC’s list of the most common causes of death in the U.S.
• This data guides national research priorities


Human Fallibility

Psychologists and human factors engineers have long known that even the smartest and most conscientious individuals make mistakes, and make them frequently!


Medical Error Information For the Patient

Community Focus on Patient Safety
Inherent Imbalance Between Production and Protection

• An imbalanced system will eventually lead to a catastrophic event

• Are the original processes inadequate ... or are they being bypassed in the interest of production?

The ‘Swiss Cheese’ Model of Error

• Prescriber’s knowledge
• Computer Screening
• Pharmacist’s knowledge
• Patient risk factors
• Pharmacogenetics
• Drug administration
• Patient education
• Monitoring

Mistakes in Prescribing

• Overriding Medication Alerts
  • A 2009 study of 2,872 clinicians in three states examined over 3 million electronic prescriptions:
    • Approximately 75% of drug allergy warnings were ignored
    • Approximately 90% of serious drug interactions were ignored

  Dangerous interactions between drugs account for the majority of medical malpractice mistakes

Mistakes in Prescribing

• Failure to report drug problems to the FDA
  • One analysis of 37 studies found that only 6% of “new, rare, or serious” adverse drug reactions were reported spontaneously to regulatory authorities
  • Physicians may view this as being anecdotal or unscientific
  • Patients may report to FDA’s MedWatch, but should additionally encourage their physician to do so.
Computerized Provider Order Entry (CPOE)

Initially heralded as a breakthrough that would “eliminate medication prescription errors”

Advantages:
• Eliminates handwriting interpretation issues
• Drug-drug interaction warnings
• Easy identification of prescribing physicians
• Ability to avoid specification errors (i.e. trailing zeros or inappropriate abbreviations)

Disadvantages:
• “Forced field” entries
  • “generically assigned values”
  • Limitations of decimal places
    • One study reported a doubling of infant mortality after the introduction of CPOE
    • Is it altering communication patterns of the team?
• One study of the CPOE system documented 22 different error-increasing aspects of the system
• Delays in emergency care

CPOE Error
Decision Support Systems (DSS)

Typically an “add on” to CPOE systems that helps warn prescribers about:
- Drug-drug interactions
- Dose limits
- Allergies
- Best Practice Guidelines
- “Order sets” (groups of drugs that often work together)

Decision Support Systems (DSS)

Advantages
- Dosage guidelines and warnings reflect the latest research
- Quick access to evidence-based medicine information

Disadvantages
- “alert fatigue” – constant reminders that carry little to no clinical value
- 80 – 96% of alerts are ignored or overridden by prescribers

Decision Support Systems (DSS)

• Reliability (Metzger and colleagues study data):
- DSS detected only 53% of all medications that would have resulted in fatalities
- Drugs prescribed for a wrong diagnosis were caught only 15% of the time
- Drugs inappropriate for a patient of a given age were intercepted only 14.1% of the time

Computerized Aids

• Use as an added tool … not as a crutch!
- Don’t “switch off” the brain when you “switch on” the computer!
"Top 10 Screw-ups Pharmacists Make"

1. Not counseling patients
2. Dispensing the wrong drug
3. Dispensing the wrong dose
4. Ignoring Interactions
5. Not standing up to doctors
6. Trusting all generic drugs
7. Relying on inadequate labels and leaflets
8. Not reporting errors
9. Switching drugs without patient approval
10. Not supervising supporting staff carefully

Mistake: Not Counseling Patients

- One 2003 study estimates that the rate of counseling has dropped nearly by half, from 43% to only 27% over the prior 14 years.
- A 2009 “secret shopper” study found that patients were offered counseling for new prescriptions only about 25% of the time.

Mistake: Dispensing the Wrong Drug

- Look alike / Sound alike drugs
  - Lamictal® / Lamisil®
  - Zantac® / Xanax®

High Alert Medications

- ISMP created and periodically updates a list of potential high alert medications:
  - http://www.ismp.org/Tools/institutionalHighAlert.asp (included as an appendix to the handout)
- The Joint Commission and regulatory agencies provide direction for handling high-alert medications.
Mistake: Failure to Use Metric Measurements

- Eliminate dosage cups with measurements in fluid drams
- Provide a suitable tool for precise measurement

Mistake: Ignoring Interactions

Is the pharmacist the exclusive authority in overriding flagged drug interactions … in practice, not just in policy?

- In a 1996 “secret shopper” investigative report by U.S. News & World Report, shoppers were sent into 245 pharmacies in seven cities, submitting two incompatible prescriptions at the pharmacy counter. At least 33% of the time, the shopper was given both drugs without warning.
- In a 2003 “secret shopper” study, more than 67% of patients purchased OTC aspirin when they picked up their prescription for warfarin without question

“Ten Drug Interactions Every Pharmacist Should Know”

- Fluoxetine and Phenelzine
- Digoxin and Quinidine
- Sildenafil and Isosorbide Mononitrate
- Potassium Chloride and Spironolactone
- Clonidine and Propranolol
- Warfarin and Diflunisal
- Theophylline and Ciprofloxacin
- Pimozide and Ketoconazole
- Methotrexate and Probencid
- Bromocriptine and Pseudoephedrine

Mistake: Not Standing Up to Doctors

- Barriers to Professional Communications:
  - Delays in returned phone calls
  - Prescriber’s receptiveness to input

  ALWAYS be assertive if you suspect a safety problem for a patient!
Mistake: Ignoring Patient Reports About Generic Drugs

- **FDA’s approval process for generic drugs is not without flaw**
  - FDA resources to monitor the manufacturing process adequately (especially in overseas plants)
    - Up to 40% of the drugs Americans take are imported
    - Up to 80% of the active pharmaceutical ingredients are imported
  - The Government Accountability Office reports that 64% of foreign plants have NEVER been inspected by the FDA
  - Inactive ingredients (colors, binders, fillers, etc) may vary
  - Mechanism of releasing the active ingredient may vary
  - Large number of generic medication recalls

*Suggestion: Investigate patient concerns of generic medication variations with an open mind. Do not blindly accept that all generic drugs are always identical.*

Mistake: Relying on Inadequate Labels and Leaflets

- **Limitations of information on label**
  - “Take before meals”
  - How much information is contained on an OTC label versus one given with a legend drug?

Mistake: Relying on Inadequate Labels and Leaflets

- **Printed drug information leaflet**
  - Information contained in these leaflets varies significantly from one pharmacy to another
  - Frequency of updates varies
  - A 2005 survey concluded that fewer than 10% of all leaflets collected from 384 community pharmacies met quality criteria regarding contraindications, precautions, and how to avoid harm.

Mistake: Not Reporting Errors

- **Reporting requirements are often sparse or non-existent**
  - Most states have no reporting requirements
  - NC requires reporting of fatal errors
  - Reluctance due to fears of litigation

- **The ISMP Medication Errors Reporting Program (MERP) is a confidential national voluntary reporting program that provides expert analysis of the system causes of medication errors and disseminates recommendations for prevention.**

Mistake: Not Supervising Support Staff Carefully

- Huge variances in pharmacy technician educational requirements
  - PTCE
  - ExCPT
  - Accredited programs
  - Programs that target passing one of the recognized exams
  - Some states require no registration of pharmacy technicians
  - Some settings use minimal oversight
  - One study of hospital pharmacies concluded that pharmacists fail to catch one out of five technician errors.

Pharmacy Technician Training In the News:

The Emily Jerry Foundation for Patient Safety and Safe Medication Practices

Tragic Event Driving Change Within the Medical Community

https://emilyjerryfoundation.org/
The Most Vulnerable Among Us

Pediatric Patients

- Geriatric Patients

Geriatric Population

- Senior citizens take 1/3 of all prescription medications
- 52% of seniors take more than 5 medications

Patients taking 7 or more medications have an estimated 82% chance of experiencing an adverse drug reaction

Geriatric Population

- Many prescribers are inadequately trained in evaluating special needs of senior citizens
  - In one study of physician knowledge about prescribing to elderly patients, 71% scored poorly.
  - 75% of these physicians reported feeling confident in prescribing drugs to older patients
  - There are currently approximately 7,000 geriatricians (compared to 80,000 pediatricians)
  - Students are rarely required to take coursework in geriatric medicine

Geriatric Population

“We are woefully unprepared. The U.S. Healthcare System is in denial about the impending demands. Little has been done to prepare the health care workforce for the aging of our nation and the current supply and organization of the health care workforce will simply be inadequate to meet the needs of the older adults of the future.”

- John Rowe, MD, IOM committee chairman in a testimony to the U.S. Senate
The Beers List

Medications that older people should generally avoid


(included as an appendix in the handout)

Outdated & Recalled Medications

A process must be established to regularly review the pharmacy drug inventory to remove expired medications.

• Written procedures should be established to facilitate a timely removal
• Do we know ALL areas in the facility where these items may be stocked?

Error Prone Abbreviations

ISMP and FDA are conducting a national campaign to eliminate the use of error-prone abbreviations in all forms of medical communications:


(included as an appendix to the handout)

Examples

Intended dose of 4 units in patient history interpreted as 44 units. “U” should be written out as “unit.”

http://www.ismp.org/tools/abbreviations/default.asp
Examples

Intended dose of “.4 mg” interpreted as 4 mg from medication order. Should be written as “0.4 mg.”

Examples

“Potassium chloride QD” in medication order interpreted as QID. Should be written as “daily.”

Implement “Do Not Use” List

Consider All Communication Forms:
- Written orders
- Internal communications
- Telephone/verbal prescriptions
- Computer-generated labels
- Labels for drug storage bins
- Medication administration records
- Preprinted protocols
- Pharmacy and prescriber computer order entry screens

Tall Man Lettering

Since 2008, ISMP has maintained a list of drug name pairs and trios with recommended, bolded tall man (uppercase) letters to help draw attention to the dissimilarities in look-alike drug names:

BuPROPion  BuPIRone
DOBUTamine  DOPamine

http://www.ismp.org/Tools/tallmanletters.pdf (Included as an appendix in the course handout)
Error Prevention Strategies

- Simplify / Standardize
- Reduce Reliance on Memory
- Use of constraints and forcing functions
- Improve Information Access
- Make Errors Visible
- Reduce Handoffs
- Automate Wisely
- Mitigate the Unwanted Side Effects of Change
- Improve Communication
- Provide Adequate Training

Thought Processing

- **Skill-based processing** ("automatic processing")
  - Routine tasks; minimal focus, with only occasional ‘checks’ to verify that the task is progressing normally
- **Rule-based processing** ("intuitive processing")
  - Awareness of an issue; matched with a past solution
- **Knowledge-based processing** ("analytical processing")
  - Awareness of an issue; unable to match the issue with a past solution
  - Requires focus and attention; may lead to a high risk of failure if there is not much time for trial and error
  - Although the risk of error is very high, it is encountered less frequently. It is a low contributor to the overall number of errors in most systems.

  *All three levels of processing may occur at once*

Error

- Human error may occur in the planning, storage, or execution of a process
  - **Slips & Lapses**: occur in the storage or execution phases (within skill-based processing)
  - **Mistakes**: occur in the planning stage (within rule-based or knowledge-based processing)

Slips & Lapses

- **Attention failures**
  - Pre-occupation, stress, distraction, etc.
  - Forgetting to affix an auxiliary label
- **Perception failures**
  - "Look-alike / Sound-alike" drugs

  *The human mind will “fill in the blanks” frequently, so that the mental check appears to confirm that the action is being carried out correctly*
Proof reading:
- Because we expect meaning to be there, it’s easier for us to miss when parts (or all) of it are absent.
- Competes with the version that exists in the mind

“When you’re writing, you’re trying to convey meaning. It’s a very high level task. As with all high level tasks, your brain generalizes simple, component parts (like turning letters into words and words into sentences) so it can focus on more complex tasks (like combining sentences into complex ideas). We don’t catch every detail, we’re not like computers or NSA databases. By the time you proof read your own work, your brain already knows the destination.”

- Tom Stafford, Psychologist, University of Sheffield (UK)

The Human Mind “Fills In the Blanks” ...
I cdnuolt blveiee that I cluod aulaclty uesdnatnrd what I was rdanieg. The phaonmneal pwor of the hmuan mnd, aocdrnin to a rscheearch at Cmabrigde Unervtisy, it dseno’t mtaet in what oerdr the ltteres in a word are, the olny iproamtnt ihng is that the frsit and last ltteer be in the rghit pclae. The rset can be a taotl mses and you can still raed it whotuit a pboerlm. This is bcuseae the huamn mnd deos not raed ervey lteter by istlef, but the word as a wlohe. Azanmig huh? Yaeh and I awlyas tghuhot slpeling was ipmorant!

Issue: Children left unattended in the car
- 400+ incidents of death or brain damage since the 1990’s!
- Not an intentional abuse or result of an uncaring parent
**IT IS THE SAME ERROR**

... with drastically different consequences!

Why does the death of a child seem to make that lapse so much more blameworthy?

Humans have a tendency to assign blame for an error in a manner that is roughly proportional to the severity of the outcome (symmetry bias).

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**Rule-Based Mistakes**

- Problem is assessed incorrectly and incorrectly “matched” to a previous problem OR a poorly written or misunderstood process is followed
  - A fragile, protein based medication is sent through the jarring automated tube system for delivery to a nursing unit
  - A poor policy of using IV syringes for oral medications

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**Knowledge-Based Mistakes**

Mistakes that occur during focused problem solving

- No experience with the problem + No rule to apply = High likelihood that the devised plan will be incorrect
- May, at times, be countered by consulting another colleague

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**Violations**

- A good rule, standard, or safe operating procedure is bypassed
  - Optimizing Violations: rule is violated because it is fun or exciting
  - Necessary Violations: rule is violated because it is impossible or inadvisable to follow the rule at that time
  - Routine Violations: rule is violated because it seems clumsy or unnecessary

Focus on rewarding those who follow the process appropriately.
Human Fallibility – Sleep Deprivation

- **Statistics:**
  - Sleep deprived interns made nearly twice as many errors.
  - Working a schedule of 24 hours every four to five nights (with three hour naps) impaired residents’ driving performance to the same degree as a blood alcohol level of 0.04 – 0.05%.
  - Interns working for longer than 20 consecutive hours had a 61% increased odds of suffering a needle-stick or scalpel injury on the morning after working all night.


Night shift workers are prone to increased error rates:
- Circadian rhythms are out of phase.
- Substantial loss of sleep efficiency in daytime sleepers.
- Often begin shifts many hours after awakening.


Human Fallibility – Sleep Deprivation

- Sleep Inertia
  - Impaired alertness and performance immediately after awakening.
  - Gradually dissipates over time, with effects lasting up to 2 hours.
  - The propensity to err in the first few minutes after awakening may exceed even that which is induced by 24 hours of total sleep deprivation.


Reducing Fatigue in the Pharmacy

- Discuss workplace fatigue at staff meetings.
- Evaluate shift length and overtime.
- Evaluate rotating shifts.
- Have a policy on second jobs.
- Consider what role fatigue could play when reviewing any medication errors.
- Educate staff about sleep hygiene, the use of caffeine, and the effects of fatigue on patient safety.

The “Small” Stuff ...

• The “small stuff” is often the BIGGEST thing in patient safety!
  • Thousands of actions and routines precede, accompany, and follow the bigger “miraculous” feats in medicine


Culture of Our Workplace?

• Is emphasis placed on assigning blame for problems rather than seeking solutions for improvement?
  • Promotes little interest in a broad, high-level investigation of strategies for reducing systemic medical errors


Blame and Train Culture

• **Premise:** Those who do not exhibit perfect human performance need further education to attain perfection. Additional training could be bypassed in favor of termination.
  • **Thought:** the threat of this type of discipline will encourage those who have not yet erred to continue exhibiting perfect human performance


Culture of the Workplace

• **Problem with “hierarchies” in Health Care**
  • Reluctance to report errors made by an attending physician
  • Reluctance to contact the attending physician due to perceived or actual repercussions for doing so
  • Is the “what” was discovered more relevant than “who” made the discovery?
    • Are we demonstrating that it can be dangerous for a junior person to ‘trump’ a senior practitioner?
    • Are we equating “messing up” in the management of power relationships with the value of patient safety?
    • Are we completely comfortable in saying, “Please tell me if I’m making a mistake”?
    • Re-training of the “captain’s orders” mentality

Culture of the Workplace

• Problem with “Inter-professional hierarchies” in Health Care
  • 19th Century inspired thought: “The nurse is a tool of the doctor. The doctor would never consult a nurse about elements of patient care.
  • Pharmacists – Physician relationships:
    • Is there apprehension of approaching physicians with a suspected medical error? “Is the pharmacist questioning my judgment?”
    • New Thoughts: Focus on the healthcare TEAM in improving patient safety

Culture of the Workplace

“People who have been socialized to believe that they are “subordinates” dealing with a “superior” will be reluctant to cross status boundaries and will fear reprisals if they do. They will be unlikely to tell “superiors” that there is a problem or that the “superior” is about to make a very bad mistake if they have been socialized to defer to those status hierarchies. That is why, when input is offered, someone with team intelligence will acknowledge it, consider it, and thank the person for his or her efforts.”

- Suzanne Gordon, healthcare journalist

Patient Safety Culture Surveys

• Agency for Healthcare Research and Quality at www.ahrq.gov.
  • Patient Safety Culture Surveys
    • Allows organizations to survey to get a sense of how people feel about the safety culture and their environment.
    • Available for hospitals, nursing homes, office-based settings
    • Typically conducted every other year
    • Many of the measures are associated with communication and teamwork
    • Reinforces the presence of a top-down emphasis on safety

Identifying Potential for Error

The potential for error exists throughout the entire healthcare system:
- undisclosed harmful side effects
- inadequate follow through with regulatory authority after products have been approved
- human error
- inadequate patient education
Continuous Quality Improvement (CQI)

“A systematic, organized approach for continually improving processes to deliver quality services and products”

“A structured, organizational strategy for involving personnel in planning and executing continuous flow of improvements to provide quality healthcare that meets or exceeds expectations.”

Many state boards of pharmacy are contemplating or already requiring community pharmacies to have a Continuous Quality Improvement (CQI) program in place.

Continuous Quality Improvement Models

• **Common Elements:**
  - Defines CQI and links it to the organization’s strategic plan
  - Establishes a quality control council comprised of organizational leadership
  - Focus is on the patient
  - Work teams are established to promote employee process improvement
  - Establishes and maintains educational and training programs

CQI Methodology: The FOCUS-PDCA Cycle

- **F** find the process to improve
- **O** organize the interdisciplinary team
- **C** clarify the baseline problem
- **U** understand variation in the current process
- **S** select the process for change
- **P** plan the change
- **D** do (implement) the change
- **C** check the results of the change
- **A** act to spread or sustain the change

Medication Error Reporting

“Sometimes a clearly defined error is the only way to discover the truth.”

- Benjamin Wiker, The Mystery of the Periodic Table

Root Cause Analysis (RCA)

A systematic process to identify the causal factors that contributed to the occurrence of a sentinel event

Focus is on systems and processes, not individual performance
Points out significant underlying and fundamental systemic conditions that increase the risk of adverse events.

Goal: Design systems to prevent or attenuate errors through proactive risk assessment

Sentinel Event

The Joint Commission defines a sentinel event as an unexpected occurrence involving death or serious physical or psychological injury or risk thereof

Forming the Root Cause Analysis Team

• Leadership/owner: empowered to make decisions
• Individual knowledgeable about the actual event
• A colleague familiar with the pharmacy’s processes
Elements of Team Intelligence

• Introduction of all team members to one another (names and functions in within the team
• Sharing of common goals and information
• Listening, acknowledging, and respecting one another’s concerns
• Viewing other team members as resources, not competitors obstacles
• Cross-managing of one another to prevent, manage, and contain error
• Engaging in team learning and teaching opportunities
• Recognizing and dealing with obstacles and barriers to teamwork
• Placing the team mission (patient safety) over considerations of status or false authority
• Publicly acknowledging the roles and contributions of other teammates

Fundamental Questions

1. What happened?
2. What normally happens?
3. What do policies/procedures require? (helps determine the reliability of processes and how often staff cut corners to get the work done)
4. Why did it happen?
5. How was the organization managing the risk before the event?

Gather Information

• Review the documentation
  • written prescription, computer data entry, compounding log, counseling log documentation
• Assess the physical environment
• Review the labeling and packaging
• Interview pharmacy staff involved in the incident

Create a Flow Chart of Events
Identify Root Causes

• Determine if the finding/proximate factors identified are ‘root causes’ or ‘contributing factors’

• Indicate whether or not action is needed for each ‘root cause’ and ‘contributing factor’

An Effective Root Cause Analysis:

• Identifies necessary system and process change
• Focuses on systems and processes rather than individual performance.
• Continuously asks ‘why did this (or that) happen’ until all root causes have been identified.
• Engages organizational leadership in problem solving and quality and safety improvement
• Includes participation by individuals most closely involved in the processes and systems under review
• Internally consistent—does not contradict itself or leave obvious questions unanswered.
• Includes consideration of relevant literature, identifying successful strategies in similar situations
• Includes a method to measure the effectiveness of implemented strategies over time

Case Study: Illinois Hospital

Patient: Male infant, born four months premature, remaining in the hospital’s care for the next six weeks.

Incident: The patient died suddenly after coming out of a heart operation without any clear complications from the operation itself.

Determinations:
(1) A pharmacy technician unwittingly entered information into a computer program when processing an electronic IV order for the infant, resulting in a massive sodium chloride overdose in the bag’s solution.
(2) The infant received 60 times the amount of sodium chloride prescribed by a physician.
(3) The automated alerts in the IV compounding machine responsible for identifying such problems were not activated at the time when the customized bag was prepared for the infant.
(4) The outermost label on the IV bag did not accurately reflect the compound’s actual contents.
(5) When a blood test on the infant showed an abnormally high level of sodium, a lab technician mistook the reading for an inaccuracy.
**Hindsight Bias: Beware**

The tendency for those evaluating an error to overestimate what they would have known, or should have known, at the time of the error.


**Hindsight Bias**

“...tucked inside thousands of pages of testimony and exhibits are hints that, in hindsight, the celebrated pilot could have made it back to La Guardia Airport. Pilots who used simulators to recreate the accident—including suddenly losing both engines after sucking in birds at 2,500 feet—repeatedly managed to safely land their virtual airliners at La Guardia.”


**Hindsight Bias**

“From everything I saw, knew, and felt, my decision had been made: LaGuardia was out. Wishing or hoping otherwise wasn’t going to help.”

— Chesley B. Sullenberger. *Highest Duty: My Search for What Really Matters*

**The Medication Safety Officer (MSO)**

Extending into every corner of healthcare, an MSO is a clinical practitioner designated by an organization to serve as the authoritative expert in safe medication use.

- Educator
- Preceptor
- Mentor
- Detective
- Compliance Officer
- Risk Manager
- Engineer
- Accountant
- Statistician
- Computer Analyst
- Counselor
Medical Safety Officer (MSO)

- Should be familiar with the standards of care
  - Joint Commission
  - ASHP Accreditation Standards
  - APhA Positional Statements
  - State Board of Pharmacy Interpretations

Financial Costs of Preventable Medication Errors

- Current understanding is highly incomplete
- For hospital care, there is one estimate of the extra costs of inpatient care for a preventable ADE incurred while in the hospital—$5,857 (Bates et al., 1997)
  - Yields an annual cost of $2.3 billion in 1993 dollars or $3.5 billion in 2006 dollars

Patient Safety: A multitude of Tradeoffs

- Tradeoffs between safety and...
  - Time
  - Staffing levels
  - Money
  - Training
  - Amount/Quality of supervision
  - Hiring decisions
  - Labor Relations
  - Promotion Decisions
  - Quality of technology
  - Management style
  - Macroeconomic policies
  - And many more...

The Political Aspect of Patient Safety

- Directly impacted by policies and decisions made by those in power
  - Reimbursement limits
  - Limitation of working hours
  - Ability of patients to obtain insurance coverage / medical care
  - Defined limitations on professional functions
“Errors do not cease to be errors simply because they’re ratified into law.”

- E.A. Bucchianeri, Brushstrokes of a Gadfly

The Paradox of Medical Errors

• Facilities can’t charge patients more money for not harming them, but ironically, facilities can sometimes make more money from treating the harm that they have caused

• U.S. government’s decision to deny reimbursement to hospitals for certain avoidable errors (“never events” surgery)

Conflicts of Interest

• Community hospital revenue generators are physicians who bring business with them
  • Hospital may be reluctant to question methods in fear that the physician will take his patient population to a competing hospital

Paradox of Patient Safety

“Patient safety is something we strive to ensure but cannot achieve by doing any one thing, or even by improving many things. Patient safety requires fixing everything that we can think of and many more things that we do not yet know about. Patient safety efforts themselves can endanger patients’ safety through conflicting or confusing initiatives or onerous reporting requirements.”

- Ross Koppel, PhD
“Success sits on a mountain of mistakes”
- Bangambiki Habyarimana, The Great Pearl of Wisdom

Inherent Imbalance Between Production and Protection

• An imbalanced system will eventually lead to a catastrophic event
  • Are the original processes inadequate … or are they being bypassed in the interest of production?

What Is My Own Contribution to Patient Safety?

• Can we assess our influence adequately?
• Are we seeing an accurate representation when we peer into the mirror?

**How does your image appear to the patient?**

Sources Cited

Sources Cited

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