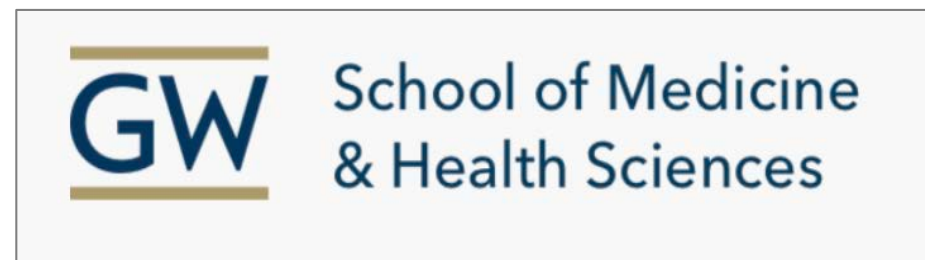


**MEDICATION ERRORS:
UNDERSTANDING THE CAUSES AND
DESIGNING EFFECTIVE RISK
MANAGEMENT STRATEGIES**

**DR. SHAUNA WHITE
EXECUTIVE DIRECTOR, BOARD OF PHARMACY,
DEPARTMENT OF HEALTH
DISTRICT OF COLUMBIA**

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More resources available at:
<https://dchealth.dc.gov/dcrx>

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OVERVIEW

- The purpose of this module is to engage health care providers (prescribers), pharmacists, and other health care professionals in evidence based practices to avoid medication errors and enhance patient safety. Successful attainment of knowledge by the learner will enable improved awareness and lead to changes in clinical practice measures to overcome common causes of medication errors.

LEARNING OBJECTIVES

Upon completing the module the learner should be able to :

- Establish an understanding of contributing factors and epidemiology of medication-related patient safety events
- A discussion on current research on causality (root cause analysis) and human factors design features to mitigate them
- A review of best practice approaches in reducing errors in the inpatient and ambulatory setting (clinic and pharmacy)
- Identify systems level innovations in risk management strategies that can be used to minimize or prevent medication errors and equip professionals to manage the consequences when they occur

DC | HEALTH

Current Safety Challenges with Medications in the Inpatient and Ambulatory Settings

Allen J Vaida, BSc, PharmD
Executive Vice President, Institute for Safe Medication Practices

DISCLOSURE

Allen Vaida declares no conflicts of interest, real or apparent, and no financial interests in any company, product, or service mentioned in this program, including grants, employment, gifts, stock holdings, and honoraria.

INSTITUTE FOR SAFE MEDICATION PRACTICES

- Not-for-profit medication safety organization affiliated with ECRI
- Operates a National Medication Errors Reporting Program for practitioners and consumers www.ismp.org
- Follows up with reporters, manufacturers, FDA, and network of practitioners
- Analyzes errors and reports on recommendations for prevention
- Publishes recommendations

ASSUMPTIONS

- To Err is Human
- Healthcare is complex and inherently risky
- Medication errors are multifactorial
- Focus should be on fixing the complex medication use systems in which we work
- Error prevention is proactive and involves planning and ongoing effort



CAPTURING ERRORS AND ANALYZING THEM

- Voluntary reporting programs
- Information from technology (infusion pumps, bar coding, EHR, electronic prescribing and pharmacy systems)
- Focused reporting (triggers, specific medications)
- Surveillance systems (AI)
- Most important is using internal and external information

ASSESS-ERR™ MEDICATION ERROR WORKSHEET

[HTTPS://WWW.ISMP.ORG/RESOURCES/ASSESS-ERR-WORKSHEETS](https://www.ismp.org/resources/assess-err-worksheets)

STEP 2

Key Element	Possible Causes	Y/N	Comments
I	Critical patient information missing? (e.g., age, weight, allergies, pregnancy, patient identity, address, indication for use)		
II	Critical drug information missing? (e.g., outdated/absent references, inadequate computer alerts, independent checks for high-alert drugs/high-risk patient)		
III	Miscommunication of drug order? (e.g., illegible, ambiguous, incomplete, misheard, or misunderstood spoken rx, poor fax, unable to clarify with prescriber)		
IV	Drug name, label, packaging problem? (e.g., look- and sound-alike names, look-alike packaging, no drug image, NDC or barcode not available or not used)		

Assess-ERR™
Community Pharmacy Version
Medication System Worksheet

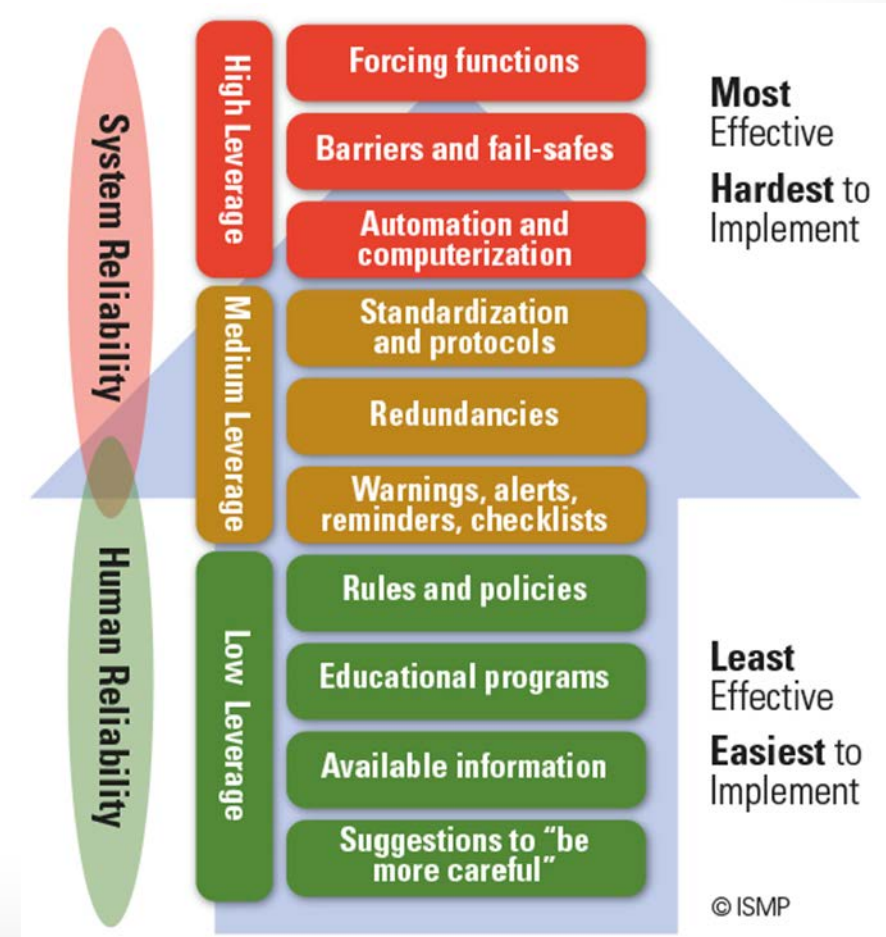
STEP 3

As a team, identify, prioritize and record "Identified Problem" from the "Comment" section in Step 2. Using the specific key element for those comments, refer to the recommendation strategies chart and select the most appropriate and effective interventions. Write selected strategies in the "Interventions Implemented" column below. This table will be used to document medication safety activities. Recommended interventions should address breakdowns in the *Key Elements* identified during event investigation. The staff should reconvene in three months time to determine if the proposed strategies have been implemented, if they are still pertinent, and if other strategies have been offered or considered since the initial review. Use a variety of strategies, as found in Appendix 4, to help generate appropriate interventions.

Identified Problem (from Comments, above)	Key Element	Interventions Implemented	Person/Dept. Responsible for Follow Up	Date Completed

HIERARCHY OF RISK-REDUCTION STRATEGIES

- High-leverage strategies
 - Design out hazards
- Medium-leverage strategies
 - Need periodic updating and reinforcement
- Low-leverage strategies
 - Aim to improve human performance



CURRENT TRENDS ON ERRORS REPORTED TO ISMP

- Electronic prescribing systems without adequate safeguards
- Similar named medication mix-ups - labeling of medication
- Methotrexate for non-oncologic use given more than once a week
- Wrong patient
- Vaccine related errors

NAME CONFUSION

- Patient had been prescribed sulfasalazine 500 mg for rheumatoid arthritis. Her outpatient pharmacy began dispensing sulfadiazine 500 mg 6 times daily instead. She continued to fill sulfadiazine monthly. She presented to the ED with kidney stones.
- Recurrent reports on mix-ups between dexamethasone and dexmedetomidine; Methylphenidate 10 mg and Methadone 10 mg
- Tramadol was dispensed in place of Trazodone
- Continued mix-ups between hydralazine 50 mg and hydroxyzine 50 mg
- Wrong prescribing and dispensing errors with metolazone and methotrexate and methimazole (caused by entering “met” while ordering)

USING ONLY 3 LETTERS FOR DRUG LOOK-UP

Medication **Compounds** **Non-Formulary**
Lookup by Type **Monograph**

Prev Page Favorites **Full Formulary** Next Page
Medications **Fluids**

+ Pitavastatin TAB (NF)
+ Pitocin 30 Units/NS 500mL
+ Pitocin Inj
+ Pitocin Inj (ED)
+ Pitressin 0.2unit/mL Drip PED
+ Pitressin Inj
+ Pitressin Inj (ED)

Medications Procedures

Name	Type	Dose	Route	Frequency	Pref List
potassium chloride (KAY CIEL) oral solution 20 mEq/15mL	Medication				IP JMH WC MEDICATI
sodium polystyrene (KAYEXALATE) oral suspension (KAYEX)	Medication				IP JMH WC MEDICATI

SAFEGUARDING FOR NAME MIX-UPS

- Provide **indications** on prescriptions, communicate with prescriber if unsure, counsel patients on all new prescriptions
- New AI software becoming available that will ‘tag’ medications to disease states
- Set up electronic systems (prescribing, pharmacy), dispensing cabinets in hospital clinics, long term care to require 4 to 5 characters.
- Visually differentiate look-alike drug names (e.g., use of TALL MAN LETTERS with bolding, highlighting) in the pharmacy computer system
- Counsel patients on all new prescriptions

SURVEY QUESTION

Patient had been prescribed sulfasalazine 500 mg for rheumatoid arthritis. Her outpatient pharmacy began dispensing sulfadiazine 500 mg 6 times daily instead. She continued to fill sulfadiazine monthly. She presented to the ED with kidney stones.

A higher-level strategy to help prevent drug name mix-ups is:

- A. Incorporate an alert in prescriber and dispensing systems for all reported name mix-ups
- B. Keep a chart of frequently confused drug names at computer terminals in the pharmacy
- C. Include the indication on prescriptions

SURVEY QUESTION

Patient had been prescribed sulfasalazine 500 mg for rheumatoid arthritis. Her outpatient pharmacy began dispensing sulfadiazine 500 mg 6 times daily instead. She continued to fill sulfadiazine monthly. She presented to the ED with kidney stones.

A higher-level strategy to help prevent drug name mix-ups is:

- A. Incorporate an alert in prescriber and dispensing systems for all reported name mix-ups
- B. Keep a chart of frequently confused drug names at computer terminals in the pharmacy
- C. Include the indication on prescriptions

Answer: C. Most similar drug names are for different indications.

FATAL METHOTREXATE ERRORS

- Analysis of inadvertent daily methotrexate administration over 18 months between 2018 and 2019¹
 - ~50% involved older patients who were confused about the frequency of administration
 - 50% were made by healthcare providers who inadvertently prescribed, labeled, or dispensed methotrexate daily when weekly was intended.
- FDA sponsored study suggests that up to 4 per 1,000 patients may mistakenly take the drug daily instead of weekly²
 - Suggests the number of dose frequency errors could be far greater

1. ISMP. *QuarterWatch*. 2019 Dec 4. www.ismp.org/resources/scope-injury-therapeutic-drugs

2. Herrinton LJ, et al. *Pharmacoepidemiol Drug Saf*. 2019;28[10]:1361-8

FDA UPDATES PRODUCT LABELING

- ISMP has received numerous reports of fatal errors when methotrexate is inadvertently taken daily instead of weekly. For example, a patient misunderstood the directions on their prescription label and took methotrexate 2.5 mg every 12 hours over several consecutive days, instead of every 12 hours for 3 doses each week. FDA has updated the product labeling and removed the option to administer weekly doses in divided doses given every 12 hours for 3 doses.
- Inform all appropriate clinical staff in your organization about this change. Make sure any printed information you give to patients reflects this change.

STRATEGIES – TECHNOLOGY

- Use a weekly dosage regimen default for oral methotrexate in electronic systems when medication orders are entered
 - For both prescriber and pharmacy systems
- Require a hard stop verification of an appropriate oncologic indication for all daily oral methotrexate orders
- Health systems may need to work with their software vendors and information technology departments to ensure that this hard stop is available




ISMP. *ISMP Targeted Medication Safety Best Practices for Hospitals*; 2020.
www.ismp.org/guidelines/best-practices-hospitals.

CASE REPORT

- Patient was prescribed, via telephone, metolazone 2.5 mg daily. Pharmacy technician accidentally selected methotrexate 2.5 mg daily by searching using the first three letters of the drug name and the strength. Patient took methotrexate daily and died less than a month later.
- No hard stop to verify an appropriate oncologic indication

▼ Critical - Patient care (1 Advisory)

!! METHOTrexate should ONLY be administered once weekly (unless indication is cancer chemotherapy). You are signing an order with a frequency OTHER THAN weekly. Either Click Cancel and change the METHOTrexate frequency, OR use the Indication is cancer chemotherapy button (Alert # 1775)

Acknowledge reason:   

OTHER STRATEGIES

- Dispense only a 4-week supply of methotrexate at a time
- Create a forcing function (using technology) to provide patient education
 - Every (new and refill) oral methotrexate prescription is reviewed with the patient
- Use teach-back method to provide patient education
 - Education should be mandatory
 - Consider using ISMP's free methotrexate learning guide for consumers (<https://consumermedsafety.org/medication-safety-articles/item/847-teaching-sheets>)

SURVEY QUESTION

Using the rank order or error reduction strategies, which may be the most effective for the previous case?

- A. Use a weekly dosage regimen default for oral methotrexate in electronic systems, both prescriber and pharmacy systems, when medication orders are entered.
- B. Have another individual check your prescription before sending it
- C. Require a hard stop verification of an appropriate oncologic indication for all daily oral methotrexate orders
- D. A and C

SURVEY QUESTION

Using the rank order or error reduction strategies, which may be the most effective for the previous case?

- A. Use a weekly dosage regimen default for oral methotrexate in electronic systems, both prescriber and pharmacy systems, when medication orders are entered.
- B. Have another individual check your prescription before sending it
- C. Require a hard stop verification of an appropriate oncologic indication for all daily oral methotrexate orders
- D. A and C

Answer: D. A hard stop verification in electronic system is the best strategy. Using a weekly default is also a high-level strategy although the default may not be corrected if the medication is for oncologic use. A double check may help but is not as effective.

WRONG-PATIENT ERRORS

- Giving a correctly dispensed prescription to the wrong patient is a common error
- Most common complaint received through the ISMP National Consumer Medication Errors Reporting Program
- Roughly a quarter of the events ISMP has received involve patients ingesting the wrong medication
- This error happens about once for every 1,000 prescriptions dispensed

Cohen MR, Smetzer JL, Westphal JE, et al. Risk models to improve safety of dispensing high-alert medications in community pharmacies. *J Am Pharm Assoc.* 2012;52(5):584-602.

HOW WRONG PATIENT ERRORS OCCUR

- Same family members (Jr, Sr)
- Inconsistent use of at least two patient identifiers
- “Is your name” versus “give me your name”
- Similar or same names – same birth dates
- Mail order – pharmacies across states –
- Not checking the bag at the pharmacy

ADDRESSING WRONG PATIENT ERRORS

- Use of at least two patient identifiers – hard stops in systems that must be verified
- Patient armbands and barcoding whenever feasible
- Mandatory patient counseling at the pharmacy

ISMP VACCINE ERROR REPORTING PROGRAM

- January 2017 through December 2018
- Total of 1,143 vaccine error reports
- 87.8% of errors reached patients
- Most errors occurred in Medical clinics (36.5%) and Physician practices (24.4%)
- About 1.4% of reports involved clusters of events. That is the same event happening to multiple individuals at the same location
- Wrong vaccine (24.2%) and wrong age (17.4%) were the most common error types

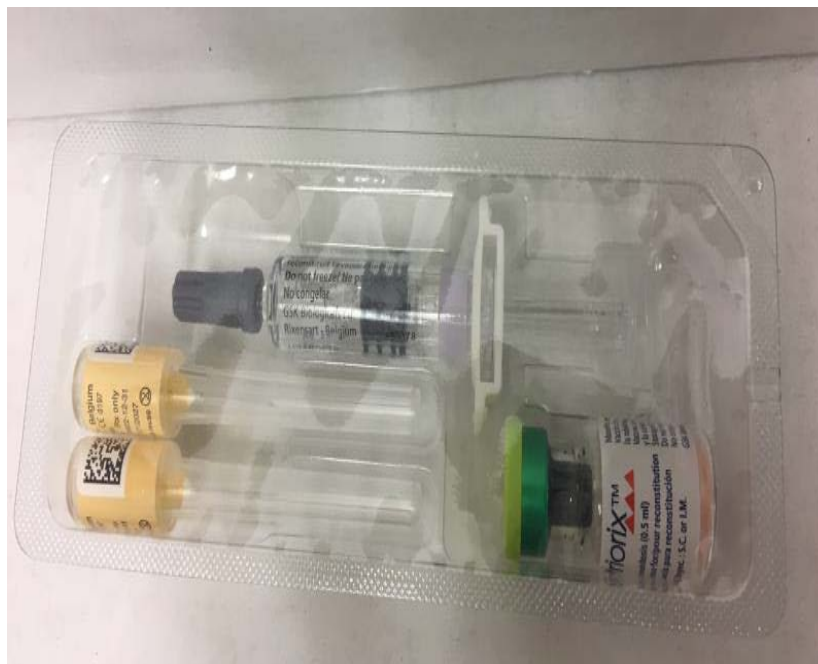
State	Event Type	Event Description	Prt	
MA	Wrong vaccine	A 37 year old man was given Fluzone High-Dose instead of Fluzone Quadrivalent.	N	Details
WA	Vaccine/component omission - Diluent given without the vaccine	HIB was give to patient mixed with the sterile water diluent not the diluent provided with the HIB.	N	Details
MI	Wrong dose - over dosage	I administered a 3 and older 0.5ml dose of Flu vaccine to a patient 24 months old.	N	Details
IL	Wrong vaccine	Patient was given MMR-V even though they were on hydroxyurea for sickle cell. Hematologist was notified of the potential contraindication. Hydroxyurea was not discontinued and patient's mother was told to inform them if any fever occurred.	N	Details
MO	Wrong vaccine	Administered ProQuad vaccine and Varicella vaccine to same individual. Nurse thought she was administering MMR and Varicella seperately but upon review, it was noted she administered MMRV in one arm and Varicella in the other.	N	Details
WA	Wrong age (patient not correct age for vaccine given)	16 year old patient was given a dose of ProQuad.	N	Details
MI	Extra dose	Pt was due for DTaP, Hep B, IPV and HIB. Clinical staff member grabbed the combination vaccine Pediarix (DTaP, HepB, IPV). What was supposed to be administered with that was an HIB but staff member grabbed an additional HepB instead. Pt received two HepB's and no HIB.	N	Details

VACCINE TYPE ERRORS

- Administering a vaccine earlier than recommended
- Wrong diluent or diluent alone
- Confusion between DTaP (children) and Tdap (adults)
- 9 other cases where insulin was given to multiple patients instead of influenza vaccine (or something else)
- Indianapolis school officials say 16 students were hospitalized as a precaution after they were mistakenly injected with insulin during a tuberculosis skin test. The Metropolitan School District of Lawrence Township says the students from the McKenzie Center for Innovation & Technology were taken to local hospitals Monday for observation after being injected with a "small dosage" of insulin by Community Health Network personnel.

STORAGE OF VACCINES

- Plan for combined storage of single component vaccines and any associated diluents, and two-component vaccines, during onsite and offsite immunization activities.
- Vaccine vials and syringes should be separated into bins or other containers according to vaccine type and formulation, and never stored together.
- Adult and pediatric formulations of the same vaccine should be separated.
- Vaccines with similar names or abbreviations, or overlapping components (e.g., DTaP, DT, Tdap, Td) should not be stored in bins or containers next to each other.



PREVENTING VACCINE ERRORS

- Use commercially available ready to administer syringes
- Implement barcode scanning
- Labeling of all drawn up syringes
- Standardized charting process
- Utilize patient or caregiver as second check
- <https://ismp.org/sites/default/files/attachments/2018-07/Teaching-table-corrected.pdf>

SURVEY QUESTION

What are practices on preventing medication errors you can incorporate in your practice setting?

- A. Share errors that occur with all staff members for the purpose of learning
- B. Review external information (e.g., FDA, ISMP, journals) on reported errors for process improvement projects
- C. Start with the most high-leverage error reduction strategies
- D. All the above

SURVEY QUESTION

What are practices on preventing medication errors you can incorporate in your practice setting?

- A. Share errors that occur with all staff members for the purpose of learning
- B. Review external information (e.g., FDA, ISMP, journals) on reported errors for process improvement projects
- C. Start with the most high-leverage error reduction strategies
- D. All the above

Answer: D. Error prevention is a multifactorial process. Utilize information from externally reported errors in the literature to implement safeguards in your practice. Use the Hierarchy of Risk-Reduction Strategies chart and remember that more than one strategy is most often layered to achieve success.

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- Abraham J, Kannampallil TG, Jarman A, et al. Reasons for computerized provider order entry (CPOE)-based inpatient medication ordering errors: an observational study of voided orders. *BMJ Qual Saf* 2018;27:299–307.

A HUMAN FACTORS APPROACH TO MEDICATION SAFETY

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@MedicalHFE

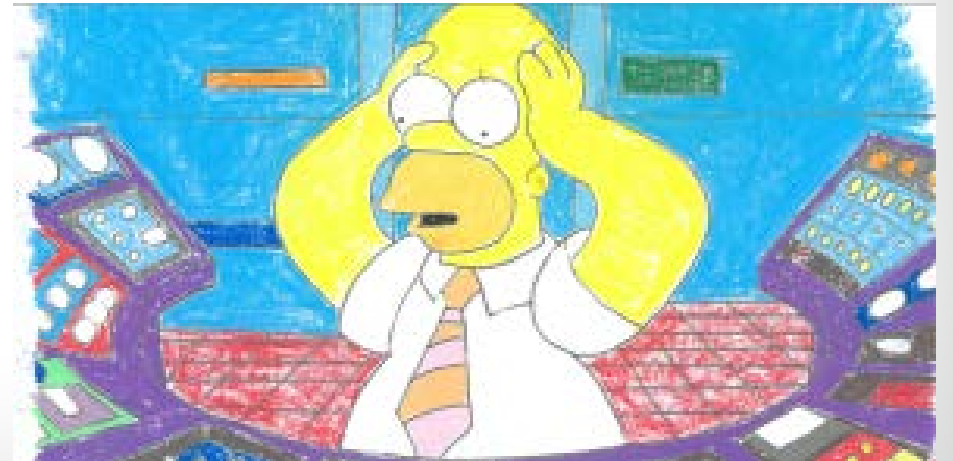
 MedStar Health
National Center for
Human Factors in Healthcare

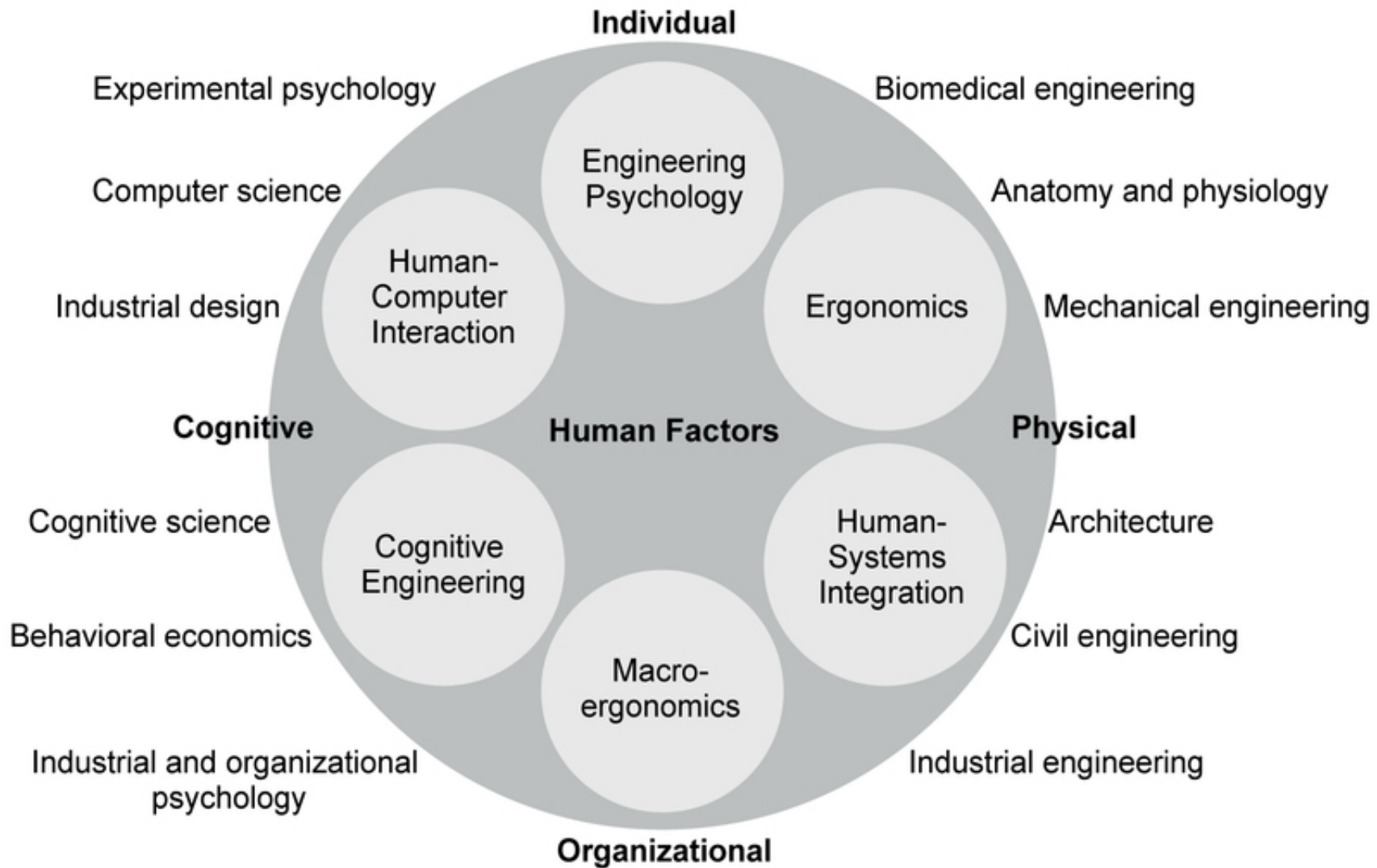
DISCLOSURES

- Research is supported by the Agency for Healthcare Research and Quality (AHRQ), National Library of Medicine (NLM), and the Office of National Coordinator for Health Information Technology (ONC)

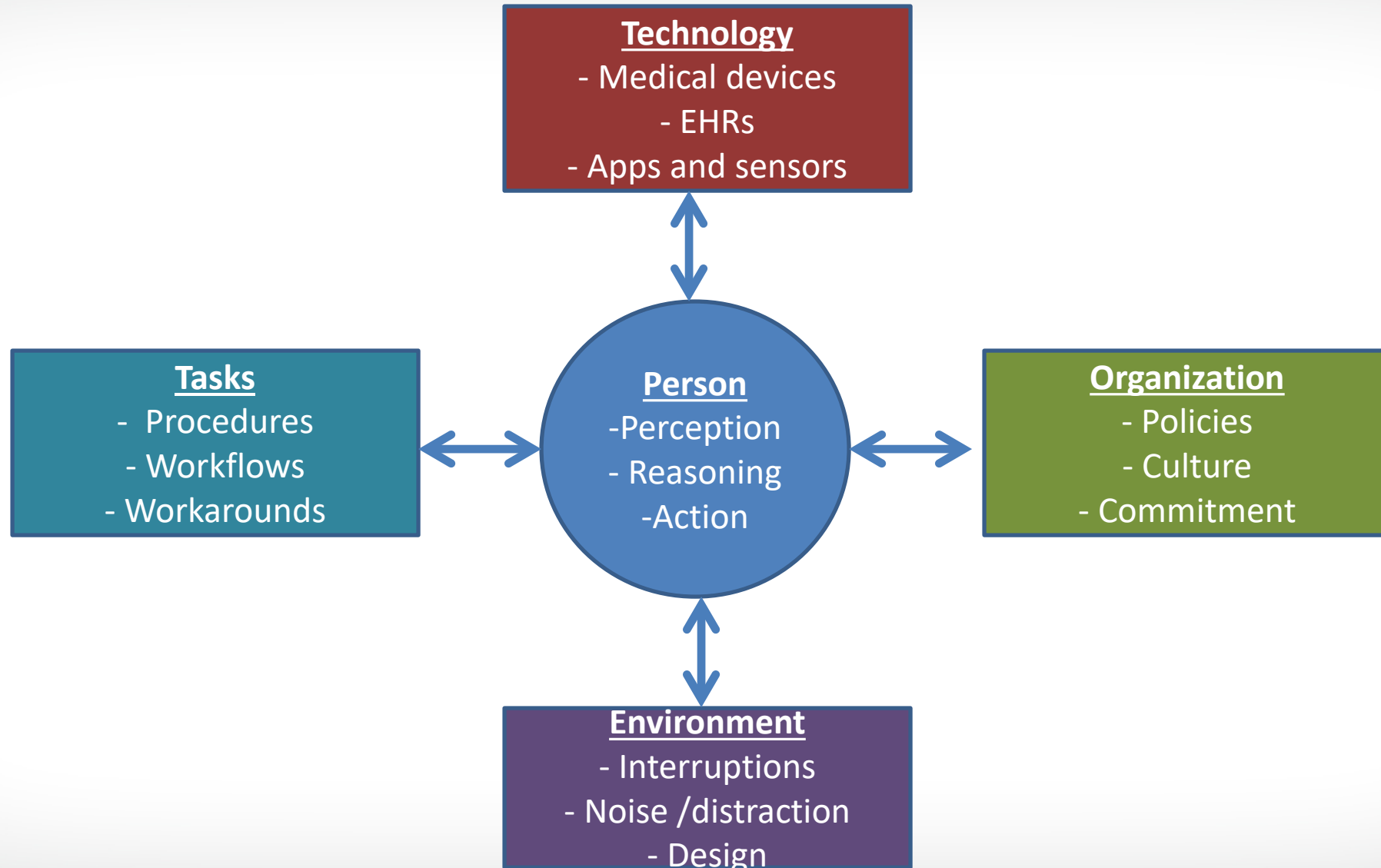
What is Human Factors?

- Designing systems, devices, software, and tools to fit human capabilities and limitations
- Using methods to gather unique information on:
 - Hidden needs of the end-user
 - Unexpected interactions between the system and the end-user
- Creating deliberate design to promote safe, efficient, effective, and timely clinical care by:
 - Making it easier to do the right thing
 - Making it harder to do the wrong thing



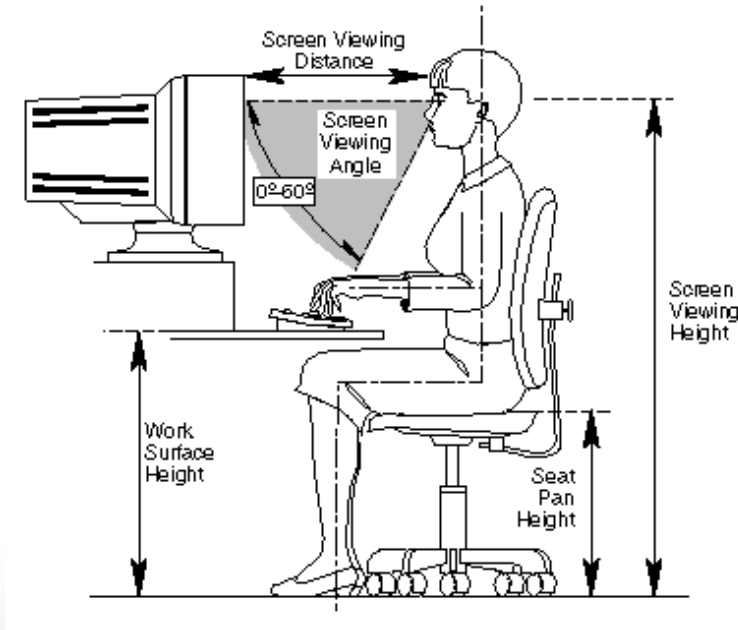


Focus on System Factors



Central Tenet of Human Factors

“We don’t redesign humans;
We redesign the system within which humans
work”



SURVEY QUESTION

A human factors approach focuses on:

- A. Blaming individuals for the mistakes they make.
- B. Ignoring work system factors and hoping for the best.
- C. Identifying system factors that contribute to errors.
- D. Blaming leadership for a poor work culture.

SURVEY QUESTION

A human factors approach focuses on:

- A. Blaming individuals for the mistakes they make.
- B. Ignoring work system factors and hoping for the best.
- C. Identifying system factors that contribute to errors.
- D. Blaming leadership for a poor work culture.

Answer: C

Human Factors and Medication Safety



System Factor	Medication Specific Elements
Person	Memory, Fatigue, Perceptual confusion
Technology	CPOE, Dispensing machines, EMAR, BCMA
Environment	Distractions, Interruptions, Stress
Tasks	Multi-tasking, Fragmented tasks, Workarounds
Organization	Unclear policies, Unsupportive & poor safety culture

Examples

Please be as careful as possible as you read this!



ISSUE: WRONG MEDICATIONS SELECTED FROM CARTS, DISPENSING MACHINES, ETC

- System Factors: Person, environment, task
- Human factors solutions: minimize chances for perceptual confusion
 - Create distinct labels and tops
 - Organize by use



ISSUE: WRONG MED, ROUTE, DOSE SELECTED FROM THE EHR

- System Factors: Technology, Person, Environment, Task
- Human factors solutions: remove irrelevant items, increase readability

```
325 mg, Soln-Oral, PO, One Time, STAT, ED ONLY
120 mg, Supp, PR, One Time, STAT, ED ONLY
650 mg, Supp, PR, One Time, STAT, ED ONLY
325 mg, Tab, PO, One Time, STAT, ED ONLY
500 mg, Tab, PO, One Time, STAT, ED ONLY
650 mg, Tab, PO, One Time, STAT, ED ONLY
1,000 mg, Tab, PO, One Time, STAT, ED ONLY
1,000 mg, Inj, IVPB, One Time, Indication: Other One time dose
325 mg, Soln-Oral, PO, q6h PRN, pain/fever/headache, Indication: Other pain/fever/headache
650 mg, Soln-Oral, PO, q6h PRN, pain/fever/headache, Indication: Other pain/fever/headache
325 mg, Supp, PR, q6h PRN, pain/fever/headache, Indication: Other pain/fever/headache
650 mg, Supp, PR, q6h PRN, pain/fever/headache, Indication: Other pain/fever/headache
325 mg, Tab, PO, q4h PRN, pain/fever/headache, Indication: Other pain/fever/headache
650 mg, Tab, PO, q4h PRN, pain/fever/headache, Indication: Other pain/fever/headache
650 mg, Tab, PO, q4h PRN, pain/fever/headache, Indication: Other pain/fever/headache
650 mg, Tab, PO, q6h PRN, pain/fever/headache, Indication: Other pain/fever/headache
650 mg, Tab, PO, q6h PRN, pain/fever/headache, Indication: Other pain/fever/headache
650 mg, Tab, PO, One Time, STAT, ED ONLY
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ISSUE: CHALLENGES WITH TAPER ORDERS

EHR Function	Usability & Safety Metrics	Vendor A- Site 1	Vendor A- Site 2	Vendor B- Site 3	Vendor B- Site 4
Prednisone Taper (60mg, reduce by 10mg every 2 days for 12 days)	Time (sec)	148.6	152.7	175.1	178.7
	Clicks	34.9	20	42.3	28.2
	Error Rate	16.7%	41.7%	50%	40%

- System Factors: Technology, Task, Person
- Human factors solutions: support work through cognitive aids; develop intuitive interfaces

2/17/2017 visit for Hospital Encounter

Discharge Other

Faulk, Robyn CSN: 1255233482 Code: Not on File Allergies: No Known Weight (kg): 60 04/15/1996
 MRN: 145434787 Age/Sex: 20 y.o. / F Loc: ED CC: Wheezing
 Research: None Lang: ENGLISH Isolation: None LOS: 0

prednisONE (DELTASONE) 20 mg tablet

Medication: prednisONE (DELTASONE) 20 mg tablet Different Version

Signature Style: Automatic Free Text

Start Date: 2/15/2017 End Date: N/A

Patient Signature: 3 PO daily for 4 days, then 2 PO daily for 4 days, then 1 PO daily for 4 days.

3 PO daily for 4 days, then 2.5 PO daily for 4 days, then 1 PO daily for 4 days. Save

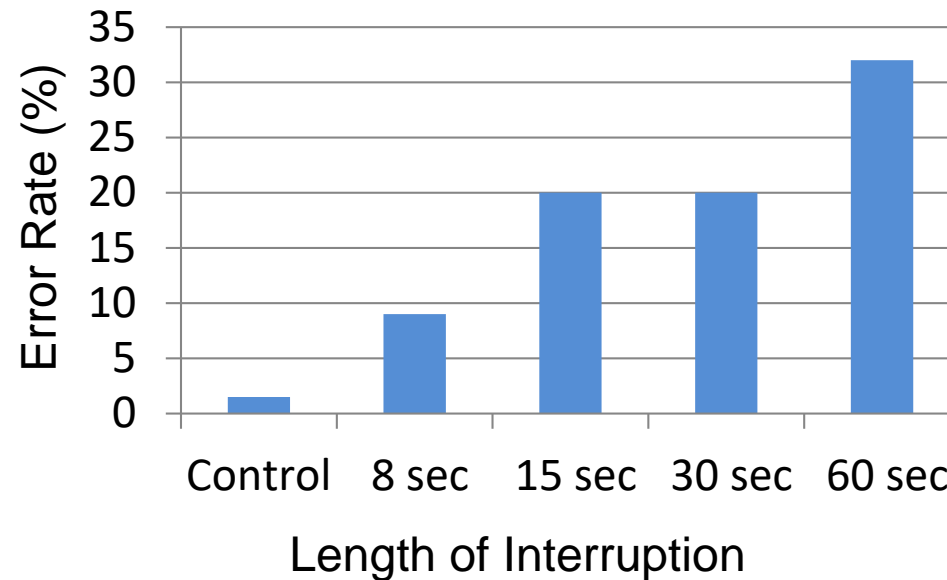
Dispense: 24 tablets

Pharmacy: Paper Electronic

Ratwani et al. (2018) A Usability and Safety Analysis of Electronic Health Records. Journal of the American Medical Informatics Association.

ISSUE: MEDICATION ADMINISTRATION ERRORS DUE TO INTERRUPTIONS AND DISTRACTIONS

- System Factors: Environment, Person, Task
- Human Factors Solutions: reduce interruptions through workflow redesign; modify environment



RIGOROUS SOLUTIONS

Strong Actions

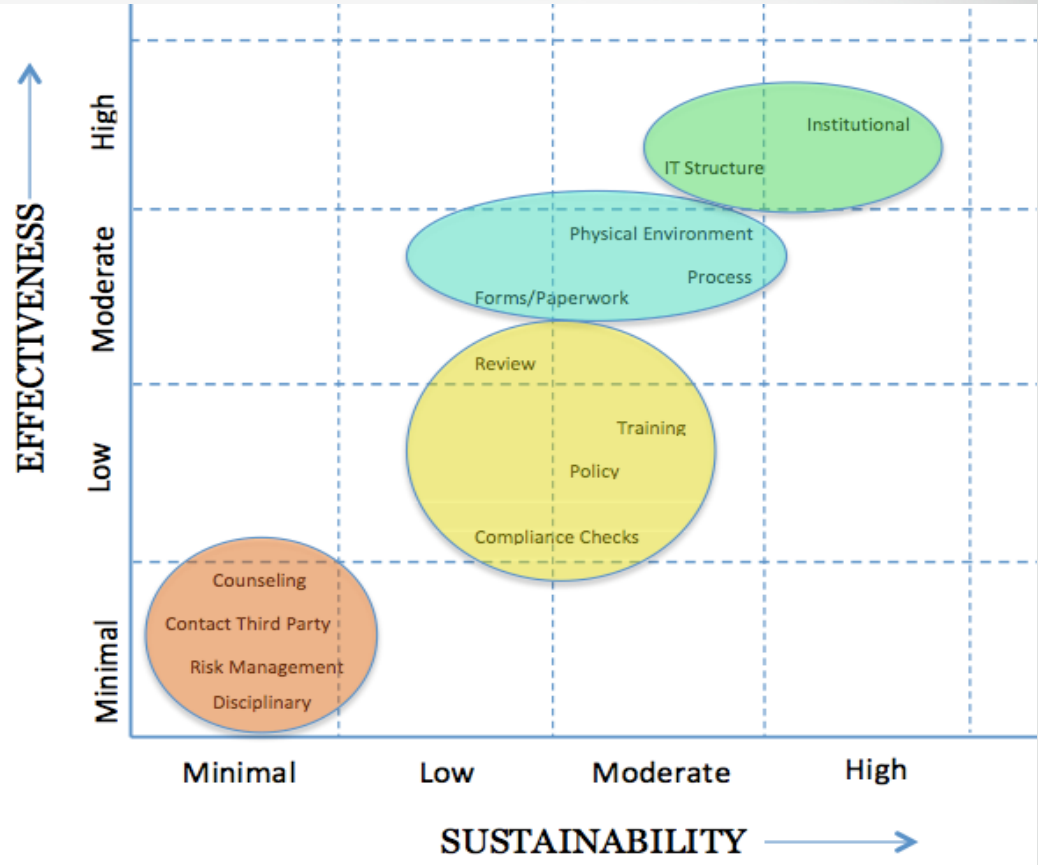
- Architectural/physical plant changes
- New devices with usability testing
- Engineering control (forcing function)
- Simplify process
- Standardize equipment or process
- Tangible involvement by leadership

Intermediate Actions

- Redundancy
- Software enhancements, modifications
- Eliminate/reduce distractions
- Simulation-based education, with periodic refresher sessions/observations
- Checklist/cognitive aids
- Eliminate look and sound-alikes
- Standardized communication tools
- Enhanced documentation/communication

Weaker Actions

- Double checks
- Warnings
- New procedure/memorandum policy
- Training



SURVEY QUESTION

The most sustainable solutions to safety hazards are:

- A. Those focused on training and discipline.
- B. Those focused on providing more warnings.
- C. Those focused on creating new policies.
- D. Those focused on system changes such as modifying the environment or technology.

SURVEY QUESTION

The most sustainable solutions to safety hazards are:

- A. Those focused on training and discipline.
- B. Those focused on providing more warnings.
- C. Those focused on creating new policies.
- D. Those focused on system changes such as modifying the environment or technology.

Answer: D

APPLICATION

Human Factors Application

Identify Areas of Risk

- Safety reports, legal claims
- Patient and clinician feedback

Analyze Work as Performed to Identify System Factors

- Observations and interviews
- Usage data

Iteratively Develop Sustainable Interventions

- Include the actual “users”
- Pilot test solutions and measure outcomes

Hydromorphone Free Emergency Department

- Risk identification: Safety incidents with incorrect dosing of hydromorphone
- Analysis: Data showed confusion over dosing with morphine; incorrect orders placed
- Solution development: System factors suggested removal from ED would eliminate events with few unintended consequences

Dilaudid *FREE* ED

Our Initiative

Removed Dilaudid
from Pyxis Machines in



Emergency Departments
(Compared to 3 control sites)

Analyzed orders
written



for Dilaudid

Reviewed patient
safety event data



for Dilaudid events

Reviewed HCAHPs
scores and staff
survey



for acceptance

SUMMARY

- Human factors focuses on understanding human capabilities and ensuring the work system meets these capabilities.
- Systems based solutions are more sustainable and effective
- Identify risks -> Analyze the situation-> Iteratively develop solutions

THANK YOU

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DISCUSSION PANEL

Marybeth Kazanas, PharmD, BCPS, LSSGB

- System Director, Clinical Pharmacy Services - MedStar Health

Georgia Z. Lewis, MSN, RN, CPNP-PC

- Pediatric Nurse Practitioner - Signature Health

Eileen R. Langstraat, Pharm.D., BCPS, CPPS

- Medication and Patient Safety Coordinator - Kaiser Permanente

**MARYBETH KAZANAS, PHARM.D, BCPS,
LSSGB**

**SYSTEM DIRECTOR, CLINICAL PHARMACY
SERVICES - MEDSTAR HEALTH**

WHAT WOULD YOU DO?

- A. Terminate the nurse, this was considered a one off event
- B. Add the warning, “FOR IM USE ONLY FOR ANAPHYLAXIS” to the automated drug dispensing machine for display when the drug is removed.
- C. Place the high concentration epinephrine vials in separate plastic bags with large, red stickers which state: “EPINEPHrine for Anaphylaxis”. The automated drug dispensing machine also displays the warning “FOR IM USE ONLY FOR ANAPHYLAXIS” as the drug is removed.

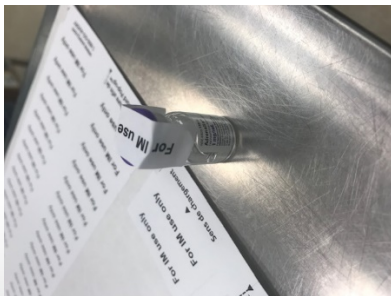
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ANSWER: C

System Actions

A long-term solution was identified which involves the development of a standard kit for the high concentration epinephrine to include an IM syringe and clear labeling on the syringe and vial.



SYSTEM SOLUTIONS

- Care for the caregiver
- Formal event review to determine causal factors
 - Conversation with experts and direct care practitioners
- Review of the literature (ISMP, AHRQ, FDA alerts)
- Use of occurrence reports (which include both near misses and harm events) and other available data to identify trends in patient safety risks associated with medications
- All medication related serious safety events are presented at the system Pharmacy and Therapeutics Committee

**GEORGIA Z. LEWIS, MSN, RN,
CPNP-PC**

**PEDIATRIC NURSE PRACTITIONER -
SIGNATURE HEALTH**

EILEEN R. LANG, Pharm.D., BCPS, CPPS

**MEDICATION AND PATIENT SAFETY
COORDINATOR – KAISER PERMANENTE**

THANK YOU

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