Medication Safety in LTC

Part II -Vulnerabilities in the Medication Use Process and Strategies to Enhance Medication Safety

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ISMP Canada
Thursday, October 20, 2011

Objectives

At the end of this presentation, participants will have gained knowledge and understanding of:

- Why medication errors occur from the perspective of systems and human factors
- Where vulnerabilities exist in the medication use processes
- Why special considerations with the use of high alert medications are important for resident safety
- What can be done to improve medication safety, i.e. strategies

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About ISMP Canada

ISMP Canada is an independent not-for-profit organization dedicated to reducing preventable harm from medications.

Our aim is to heighten awareness of system vulnerabilities and facilitate system improvements.

www.ismp-canada.org

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Canadian Medication Incident Reporting and Prevention System (CMIRPS)

ISMP Canada is a key partner in CMIRPS with Health Canada, the Canadian Institute for Health Information (CIHI), with support from the Canadian Patient Safety Institute (CPSI)

Goals of CMIRPS:

- Collect data on medication incidents;
- Facilitate the implementation of reporting of medication incidents;
- Facilitate the development and dissemination of timely, targeted information designed to reduce the risk of medication incidents (*e.g.* **ISMP Canada Safety Bulletins**); and
- Facilitate the development and dissemination of information on best practices in safe medication use systems.

We encourage you to report medication incidents

Reporting and Prevention Systems
Medication Incident and Near Miss Reporting Programs

REPORT a Medication Incident

Practitioners
Healthcare Professional - (e.g., nurse, pharmacist, physician)

SafeMedicationUse.ca
Supported by Health Canada

General Public
Preventing harm from medication incidents is not just a responsibility for health professionals - **consumers like you** can also play a vital role.

Community Pharmacy Incident Reporting

CPhIR - Community Pharmacy Incident Reporting Program
For participating community pharmacies.

ANALYZE-ERR®

Analyze-Err®
For participating healthcare facilities.

SafeMedicationUse.ca
SUPPORTED BY HEALTH CANADA

Help Prevent Harmful Medication Incidents   Contact Us | Français

A component of the Canadian Medication Incident Reporting and Prevention System (**CMIRPS**).

Home   Report an Incident   Alerts   Newsletter   Safety Tools and Resources   About Us

Preventing harm from medication incidents is a responsibility of health professionals. **Consumers like you** can also play a vital role.

Reporting Medication Incidents benefits all Canadians.

REPORT NOW

- About SafeMedicationUse.ca
- About Medication Incidents
- Why Report?
- Resolving Concerns About the Safety of Your Care
- Frequently Asked Questions (FAQs)
- Your privacy

Tell Us How We're Doing:

TAKE THE SURVEY

Found a safety concern? Why Report? → LEARN MORE

Latest News and Resources
- Similar Patient Names Leads to Pregnant Woman Getting Wrong Prescription
- Safe Practices for Medication Use (Take Charge of Your Medicines!)
- "Take as Directed: Your Prescription for Safe Health Care in Canada" is now available in Canadian bookstores!
"The authors provide helpful information that can guide Canadians on how to manage their health care, including safe medication use" says Sylvia Hyland, Vice President and Chief Operating Officer of ISMP Canada.
- Health Canada is reminding Canadians about using acetaminophen safely.
 - Read Health Canada's Information Update on Acetaminophen
 - Read the SafeMedicationUse article "Spotlight on Acetaminophen"
- Angeliq Drug Samples Mistakenly Provided as Birth Control - Newsletter - PDF
- Working with Consumers and Patients to Prevent Medication Incidents: Early Learning from ISMP Canada's Consumer Reporting and Learning Program, *www.SafeMedicationUse.ca* - Webinar - February 23, 2011
- Epinephrine Auto-Injectors - Know How to Use EpiPen and Twinject Properly - Newsletter - PDF

Background on errors

Institute of Medicine Report: To Err Is Human, 1999

Hospital medical errors kill 44,000-98,000 people per year:

"These stunningly high rates of medical errors - resulting in deaths, permanent disability, and unnecessary suffering - are simply unacceptable in a system that promises to first 'do no harm'."
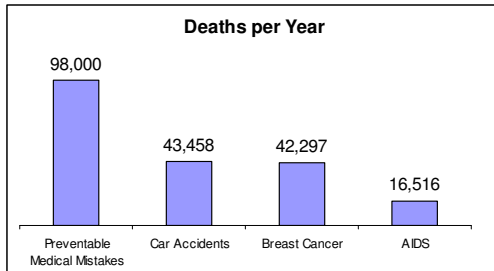
William Richardson

Preventable medical mistakes cause more deaths per year than car accidents, breast cancer or AIDS

Deaths per Year

- Preventable Medical Mistakes: 98,000
- Car Accidents: 43,458
- Breast Cancer: 42,297
- AIDS: 16,516

Source: The Institute of Medicine: To Err is Human: Building a safer health system, 1999.
Additional estimates from the Centres for Disease Control and Prevention, National Vital Statistics Reports Vol. 47 No. 25

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Canadian Adverse Events Study

- ~**7.5% of hospital admissions involved an adverse event**
- **37% of adverse events were preventable**

Extrapolation:

- Of ~ 2.5 million hospital admissions in Canada in 2000
- 70,000 incidents of harm were determined to be preventable
- between **9,000 and 24,000 deaths** due to adverse events could have been prevented

Baker GR, Norton P et al. CMAJ, May 25, 2004.

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Observations

- Issues are similar across the spectrum of care and from country to country

- We know why errors/incidents are happening

- We know a lot about what to do to improve systems

- We are starting to change –
  - It is difficult
  - It is worth it!

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Changing to a Culture of Safety

Person Approach vs. Systems Approach

The Person Approach

"The person approach focuses on the errors of individuals, blaming them for forgetfulness, inattention, or moral weakness."

J. Reason, March 18, 2000, BMJ
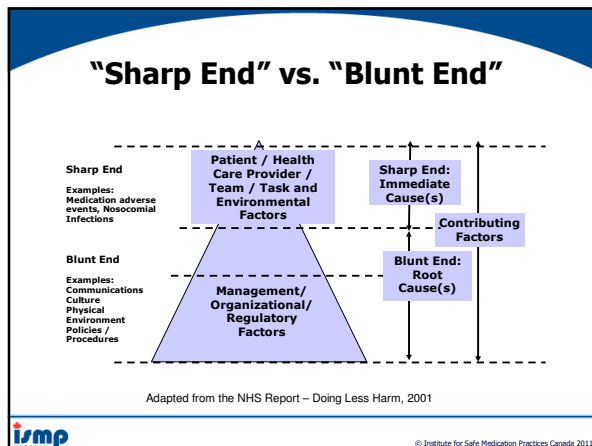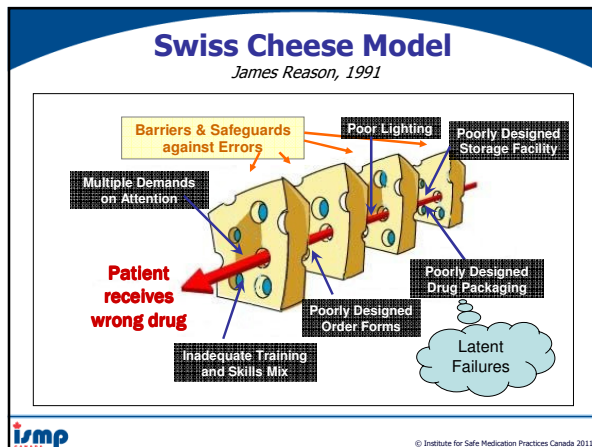

The Person Approach

Remedial measures are directed primarily at the 'sharp end' error maker: naming, blaming, shaming, retraining, fear appeals, writing another procedure, etc.

J. Reason, Halifax 10 Symposium, October 2010

"Sharp End" vs. "Blunt End"

Sharp End

Examples:
Medication adverse events, Nosocomial Infections

Blunt End

Examples:
Communications
Culture
Physical Environment
Policies / Procedures

Patient / Health Care Provider / Team / Task and Environmental Factors

Sharp End: Immediate Cause(s)

Contributing Factors

Blunt End: Root Cause(s)

Management/ Organizational/ Regulatory Factors

Adapted from the NHS Report – Doing Less Harm, 2001

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Swiss Cheese Model
James Reason, 1991

Barriers & Safeguards against Errors

Poor Lighting

Poorly Designed Storage Facility

Multiple Demands on Attention

Patient receives wrong drug

Poorly Designed Drug Packaging

Poorly Designed Order Forms

Inadequate Training and Skills Mix

Latent Failures

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The Systems Approach

"…though we cannot change the human condition, we can change the conditions under which humans work"

Reason J. (2000). Human error: models and management.

BMJ, 320(7237): 768-770. Retrieved from:
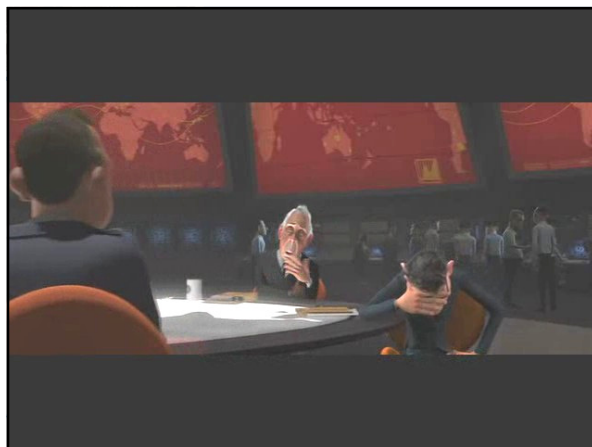http://www.bmj.com/cgi/content/full/320/7237/768

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Why do errors occur?

Environmental Factors

Human Factors
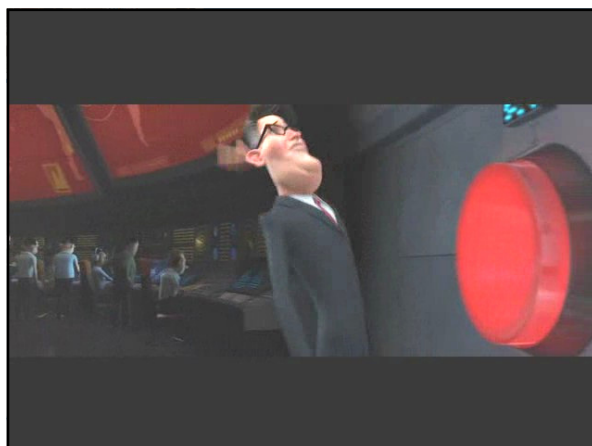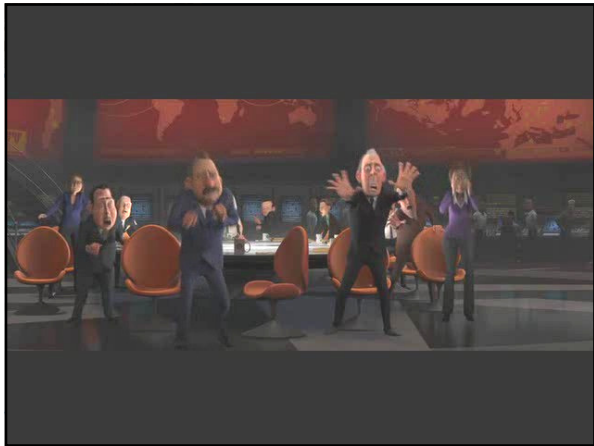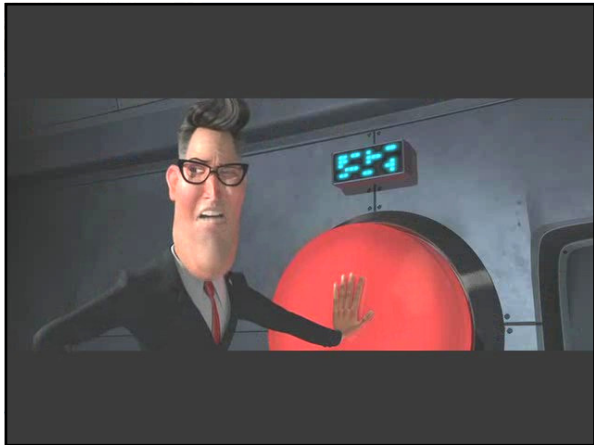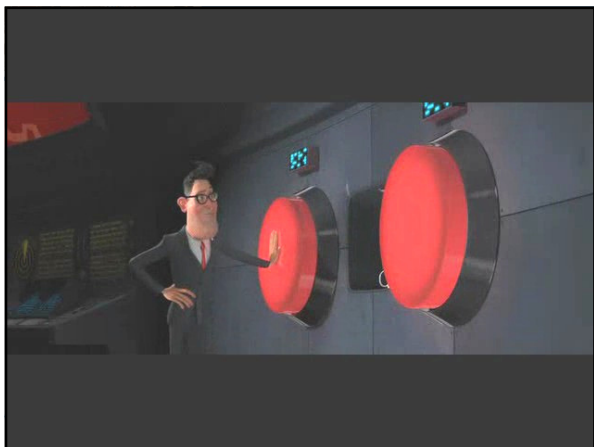
Environmental Factor Examples

- Packaging and labeling
- Dangerous abbreviations

Packaging and Labelling

Packaging and Labelling
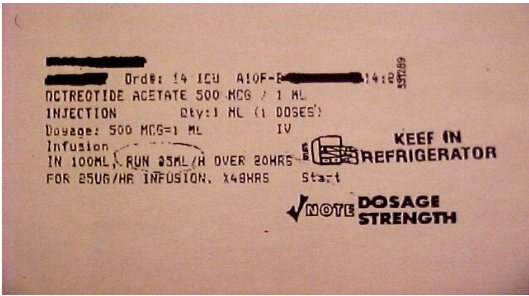
Dangerous Abbreviations

6U Regular Insulin Now

- Resulted in a 10-fold dosing error and patient harm

Dangerous Abbreviations

Human Factor Examples

- Memory
- Inattentional Blindness
- Confirmation Bias

Reliance on Memory
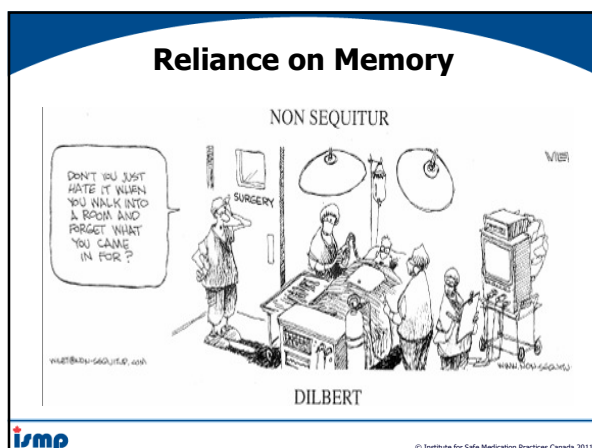
Memory
Inherent Human Limitations

- Limited memory span: 7 +/- 2 pieces of information can be held when attention is full

- Factors affecting memory
  - Stress
  - Fatigue and other physiological factors

Miller GA (1956). The magical number seven, plus or minus two: some limits on our capacity for processing information. *Psychological Review*, 63(2): 81-97. Retrieved from http://psychclassics.yorku.ca/Miller/

Figure 1. Link analysis for RN #1

Potter et al. 2004. Advances in Patient Safety;1:39-51.

Table 1. Interruptions for single RN observation (RN#3)

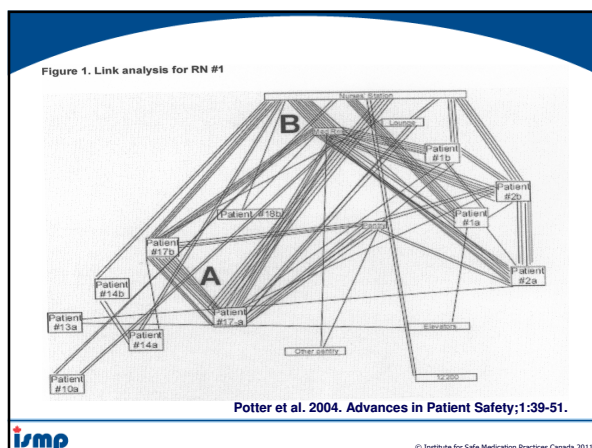| Interruption	Time	Description of interruption	Location	Type	Nursing process	Cognitive stacking measure: # activities
1	0734	Unit Clerk inquiry	Nurses desk	Delay	N/A	5
2	0808	Paged	Patient room	Disrupt direct	Intervention	10
3	0852	RN inquiry	Nurses desk	Disrupt indirect	Intervention	18
4	0853	Patient inquiry	Nurses desk	Disrupt indirect	Intervention	19
5	0935	MD rounds	Patient room	Disrupt direct	Intervention	18
6	0941	Paged	Patient room	Disrupt Indirect	Intervention	18
7	0957	Answers phone	Patient room	Delay	N/A	17
8	1010	Responds to patient call out	Hallway	Delay	N/A	17
9	1014	Computer malfunction	Patient room	Delay	N/A	17
10	1021	Unit Clerk report	Nurses desk	Disrupt direct	Planning	17
11	1104	MD inquiry	Nurses desk	Disrupt direct	Planning	19
12	1105	Unit Clerk inquiry	Nurses desk	Delay	N/A	18
13	1239	Computer malfunction	Patient room	Delay	N/A	14
14	1248	Paged	Patient room	Delay	N/A	14
15	1359	Patient inquiry	Hallway	Delay	N/A	15
16	1451	Unit Clerk report	Nurses station	Delay	N/A	11

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Memory – Safety Strategies

- Minimize reliance on memory – create process cues

- Be conscious of how many tasks you are trying to do at once

- Limit interruptions

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Inattentional Blindness

- Failing to see what should have been plainly visible
  - Because attention is not focused on it
- Most of our perceptual processing occurs outside of conscious awareness
- **Attentional resources are finite**
- Amount of attention required is affected by practice and task difficulty

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Confirmation Bias

Leads one to "see" information that confirms our expectations, rather than information that contradicts our expectations.

HINT: "Alphabet"

Hint: "Number"

Confirmation Bias: Look-Alike Drug Packaging

Workarounds or at-risk behaviour

- Natural tendency to take shortcuts to make completion of tasks easier or increase efficiency

- Workarounds occur when a procedure or action does not "fit" with the workflow

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Examples of At-Risk Behaviours in the Medication Use Process

- Preparing medications for more than one person at a time or "prepouring"
- Not taking the MAR to the bedside for sign-off when administering meds
- Borrowing medications from another patient's supply

ISMP Medication Safety Alert! October 7, 2004

Examples of At-Risk Behaviours in the Medication Use Process

- Not verifying patient allergies before prescribing / dispensing / administering medications
- Writing incomplete orders
- Not questioning unusual or incomplete orders
- Not welcoming/supporting clarification of unclear orders

ISMP Medication Safety Alert! October 7, 2004

Workaround Solutions

- Workarounds are opportunities for system improvement
- Voice your concerns to your supervisor
- Analyze the reason why workarounds occur

- Find solutions that improve patient safety

Human Factors Engineering (HFE) 101

HFE: a discipline concerned with design of systems, tools, processes, machines that takes into account human capabilities, limitations, and characteristics

HFE concepts guide RCA and FMEA.

Reality of Health Care Environments

- Cognitive overload
- Workloads
- Multitasking
- Interruptions
- Difficult technology
- Look-alike packaging and labelling
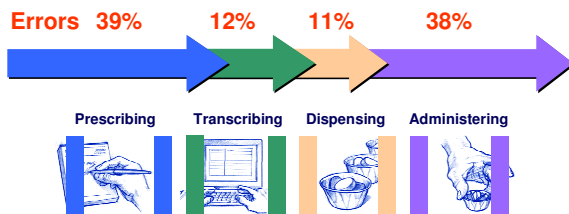- Sound-alike medication names

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HFE Principles

- Make architectural or other physical changes
- Perform usability testing
- Reduce reliance on memory or vigilance
- Eliminate / reduce distractions
- Build in redundancy
- Use warnings and labels

The Systems Approach

- Preventable adverse events are caused by interaction between:
  - flaws in the working environment (system)
  - unavoidably imperfect humans

- Adverse events can be reduced by building a system that:
  - reduces error
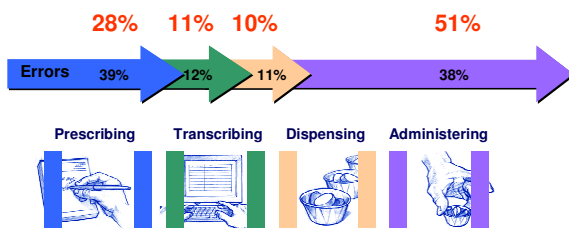 - prevents error from causing harm

Vulnerabilities during Medication Administration

Stages in the medication use process

Errors 39% 12% 11% 38%

Prescribing   Transcribing   Dispensing   Administering

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

Sources of Harm

28% 11% 10% 51%

Errors 39% 12% 11% 38%

Prescribing   Transcribing   Dispensing   Administering

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

Errors Intercepted

	48%	33%	33%	2%
Harm	28%	11%	10%	51%
Errors	39%	12%	11%	38%
	Prescribing	Transcribing	Dispensing	Administering

Leape et al. *JAMA* 1995;274:35-43
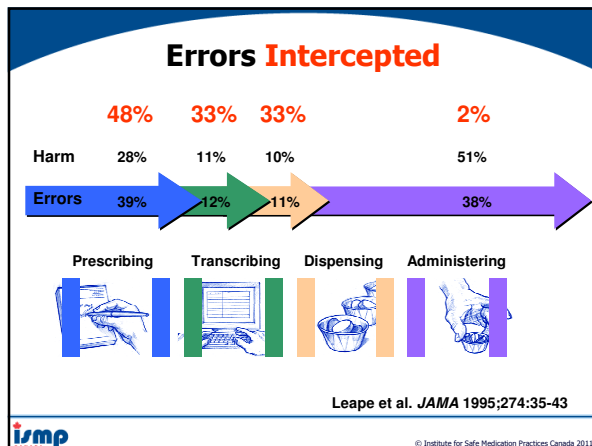
False sense of security…

What about…..

- The three checks…..

- The five rights…..
  (or seven rights)

The Three Checks

Check the label:

1. When the medication is selected;
2. When the medication is poured;
3. When the medication is returned.

Insulin Incident

But…..

What about confirmation bias, distractions, interruptions, complexity of equipment, packaging, stress, noise, lighting, nature of work etc.?

It's not about competence!

Story

An elderly woman was receiving palliative care. To help manage her pain, she was ordered:

Morphine 1 to 2 mg subcutaneously q3-4h prn

- Morphine 10 mg was administered instead of morphine 1 mg (a ten-fold error).

- When the error was identified, the attending physician and the patient's family were notified. Treatment options were discussed. The family asked that she not be given Naloxone (Narcan). She subsequently died.

Incident Analysis

Morphine available through the provincial drug formulary as:

Morphine Calculation
Available concentration = 15 mg/mL

Calculate volume needed to draw up **1 mg** dose

Nursing Strategies for Safe Medication Administration

So where should we start?

- Medication administration accounts for up to one-third of nurses' time

    Most of the time = hunting and gathering

- Nurses are human – they will <u>never </u>be error-free...even when they are *very careful*

Bates, et al. 1995; Keohane, et al. 2008; Leape, et al., 1995; Pepper 1995.

So where should we start?

- 38% of errors originate in the administration phase of the medication use process
- And, 51% of those errors cause harm
- **Only 2%** of errors occurring at this stage are intercepted

So where should we start?

- High-alert drugs
- Vulnerable, high-risk populations
- Error-prone processes

High alert medications

Definition

High-alert medications are drugs that bear a heightened risk of causing significant patient harm when they are used in error.

Examples of high alert medications

- *Concentrated electrolytes*
- *Opioids*
- *Insulin*
- *Anticoagulants*
- Chemotherapy agents
- Neuromuscular blockers
- Vasopressors

Top Ten Medications Reported as Causing Harm or Death through Medication Incidents
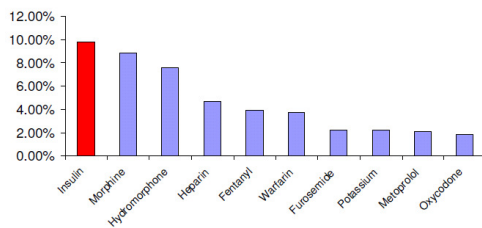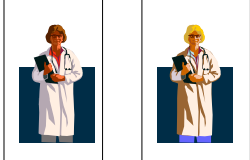
Independent Double Checks

- If performing a double check ensure that it is truly *__independent__*

- Research shows that people find 95% of mistakes when double checking the work of others

(Grasha et al. Process and Delayed Verification Errors in Community Pharmacy. Tech Report Number 112101. (2001) Cognitive Systems Performance Lab)

Reducing the Probability of Error

$$\frac{1}{100} \times \frac{1}{100} = \frac{1}{10,000}$$

What can you do?

- Report incidents when they occur and participate in follow-up reviews
- Look for and report potential hazards in your practice setting
- Support shared learning from errors
- Support your colleagues when errors occur

What Can <u>NURSES</u> Do?

- Ensure orders are complete

- Do not use/accept dangerous abbreviations

Do Not Use
Dangerous Abbreviations, Symbols and Dose Designations

2007 Cohen MR. *Medication Errors. Causes, Prevention, and Risk Management;*

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What Can <u>NURSES</u> Do?

- Do not disturb colleagues working with medications (entire process)

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What Can <u>NURSES</u> Do?

Embrace/listen/involve/collaborate with:

- patients
- clients
- residents
- families
- significant others etc…into the medication use process
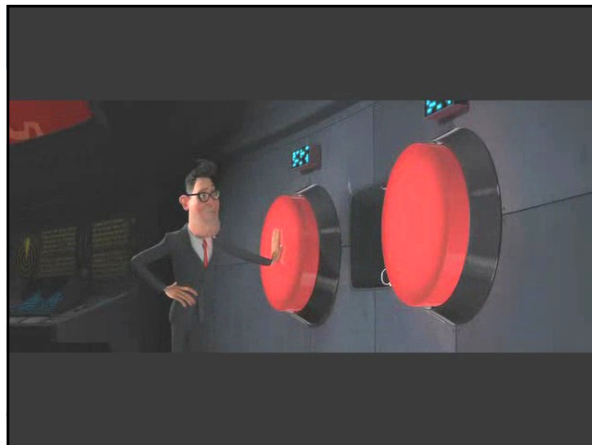- AND other healthcare professionals

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What Can <u>NURSES</u> Do?

- Look carefully at "work-arounds"

- **Trust your intuition!**
  - "if it doesn't feel right, it probably isn't"

Climate of Safety

- Embrace systems approach

- Staff encouraged to report hazards, incidents and adverse events

- Response to incidents:
  - Focus on system >>persons involved

Learning and Sharing

- Cultivate a culture of safety
- Report errors/ near misses/ hazardous conditions

Reciprocal Trust:

The system must trust that you will call out

<u>AND</u>

You must trust that the system is safe to call out to, will listen and respond

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A Daunting Task..........

Until we think of WHY

Practitioners *vs.* System Failure

"People working in health care are among the most educated and dedicated workforce in any industry. The problem is not bad people; the problem is that the system needs to be made safer."

To Err is Human: Building a Safer Health System, IOM Report 1999

"We don't believe that people come to work to do a bad job or make an error, but given the right set of circumstances any of us can make a mistake. We must force ourselves to look past the easy answer that it was someone's fault – to answer the tougher question as to why the error occurred. It is seldom a single reason."

(Veterans Affairs, 2005)

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- CMIRPS: www.ismp-canada.org/cmirps.htm

- Medication Safety Self-Assessments: mssa@ismp-canada.org

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- **Questions: info@ismp-canada.org**