Medication Safety: What You Cannot Afford to Ignore

CACCN Nursing Conference
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and

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Objectives

- ISMP Canada
- Research Highlights
- Incident Reporting
- High-Alert Medications
- Error Prevention Strategies and Tools
- What Nurses can do
- What the future holds
**ISMP CANADA Vision**

- Independent nonprofit Canadian organization
- Established for:
  - the collection and analysis of medication error reports
  - and
  - the development of recommendations for the enhancement of patient safety.
- Serves as a national resource for promoting safe medication practices throughout the health care community in Canada.
ISMP Canada Mission:

- Committed to the safe use of medication through improvement in drug distribution and drug delivery system design.

- Collaborate with healthcare practitioners and institutions, schools, professional organizations, pharmaceutical industry and regulatory & government agencies to provide education about adverse drug events and their prevention.
ISMP Canada Programs

- Voluntary reporting
  - Errors, near-misses and hazardous situations
  - Confidential
  - Non-punitive
  - Front-line practitioners provide detailed, unrestricted information on incidents

- Analysis & recommendation of prevention strategies
How Error Reports are received:

i) website: www.ismp-canada.org;
ii) e-mail: info@ismp-canada.org;
iii) phone at 1-866-54-ISMPC [47672] or 416-480-4099.

- ISMP Canada guarantees confidentiality and security of information received. ISMP Canada respects the wishes of the reporter as to the level of detail to be included in publications.
ISMP Canada Programs cont’d

- CMIRPS (Canadian Medication Incident Reporting and Prevention System)

- 3 partners:
  - ISMP Canada,
  - Canadian Institute for Health Information (CIHI) and
  - Health Canada
ISMP Canada Programs cont’d

- Medication Safety Support Service
  - Concentrated Potassium Chloride
  - Opioids (narcotics)

Medication Safety Self-Assessment (MSSA)
ISMP Canada Programs cont’d

- Fellowship program (12-month)
- Hospital Consultations
- Root Cause Analysis (RCA)
- Failure Mode and Effects Analysis (FMEA)
- Education/ Presentations
ISMP Canada’s Initiatives:

- Systems Analysis of Medication Errors (SAME) Research Study
- Canadian Patient Safety Institute (CPSI)
ISMP Canada’s Initiatives:

- Canadian Counsel on Health Services Accreditation (CCHSA) Collaborative Patient Safety Project
  - New standard 14.5- MSSA
  - Development of patient safety goals
  - Review and revisions of standards related to medication use
  - Collaborative workshops
Publications: Newsletters

The ISMP Canada Safety Bulletin is a monthly newsletter that focuses on medication safety and human factors. It contains articles on a variety of topics, including medication errors, best practices, and case studies to help healthcare professionals improve patient safety. The bulletin is published by ISMP Canada, a non-profit organization dedicated to improving medication safety in healthcare settings.

The ISMP Medication Safety Alert! is a biweekly newsletter that provides timely information on medication errors, alerts, and best practices. It covers a wide range of topics, including common medication errors, drug interactions, and patient safety strategies. The newsletter is designed to help healthcare professionals stay informed about the latest developments in medication safety and to encourage proactive measures to prevent adverse events.

Both newsletters are available on ISMP Canada's website, offering subscribers easy access to the latest information on medication safety and human factors. Subscribers can choose to receive either newsletter, or both, depending on their needs and interests. The newsletters are a valuable resource for healthcare professionals looking to improve medication safety and reduce the risk of errors in patient care.
Publications:

- Hospitals News

- Journal publications on medication safety
  - *CJHP, CMAJ*

And.................................
Thank-you for your interest, commitment and support for patient safety!
Relationships Between Medication Errors and Adverse Drug Events

- Medication Errors
- Preventable ADEs
- Potential ADEs
- Non-Preventable ADEs (ADRs)
Medical errors kill 44,000-98,000 people per year

“More people die from medical errors each year than from suicides, highway accidents, breast cancer, or AIDS”

“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
Institute of Medicine (IOM) Report cont’d

Studies included:

- Harvard Practice Study
  - 3.7% of hospitalizations in New York
  - 58% preventable

- Utah/ Colorado Study
  - 2.9% of hospitalizations
No one wants to hear that their appendix operation was a success when it was their gallbladder that needed to be removed. The fact is, errors in the health care system are a growing concern. Fortunately, most errors are preventable, especially when patients become active and informed participants in their own health. This is why UnitedHealth Foundation is providing information from medical and patient safety experts that can help keep you and your family safe. By following the tips below, you can limit the chance of getting a medical treatment that will clear up your acne when you need one to relax your muscles.

**Oops!**

**Breast Cancer**

**Vehicular Accidents**

**AIDS**

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1. Make sure you and every member of your health care team knows exactly what has been prescribed, over-the-counter medication, herbal products or supplements you may be taking. Be sure your doctors know about any allergies or adverse reactions you have to any medicine.

2. When your doctor writes a prescription, make sure you can read it and that you fully understand what it's for. Be sure you know exactly when and how to take it and that you are aware of any potential side effects your medication may cause.

3. When you pick up your medicine from the pharmacy, ask the pharmacist to confirm that it is the medicine and the dosage that your doctor prescribed.

4. If you have a test, be sure to call and get the results. No news is not necessarily good news.

5. If you need to stay at a hospital and you have a choice, choose one where many patients have had the procedure or surgery you need.

6. If you're having surgery, be sure that your health care team agrees on exactly what will be done to exactly which part of your body. Having the surgeon mark the site to be operated on is a good idea.

7. When being discharged from hospital, ask your doctor or health professional to thoroughly explain the treatment plan you will use at home, review your medications and coordinate your follow-up visit.

8. Speak up if you have questions or concerns and don't be shy about asking your doctor or nurse for more information from reliable sources. Good health professionals value the relationships they have with their patients.

We believe that the more you know about your health, the healthier you'll be. Keep this information and share it with your family and your health care team. For more information or preventing medical errors and other health care-related topics visit us at www.unitedhealthfound.org.
International Studies

- Australia (1995) – 16.6%
- New Zealand (2001) – 12.9%
- UK (2001) - 10.8%
  - Half preventable
  - 1/3 resulted in moderate or greater disability or death

And Canada........?????????.........
Canadian Adverse Events Study


**Adverse Event**

“an unintended injury or complication that results in disability at the time of discharge, death or prolonged hospital stay and that is caused by health care management rather than by the patient’s underlying disease process.” (p.1679).
Canadian Adverse Events Study
Cont’d

- 5 provinces
  - B.C., Alberta, Ontario, Quebec, Nova Scotia
- Retrospective chart review for fiscal year 2000
  - Random hospital selection
  - 1 teaching, 1 large community and 2 community hospitals in each province
  - 3745 charts eligible for review
Canadian Adverse Events Study cont’d

- Initial review by RN or health records professional
- Physician review of charts that were positive for at least one screening criterion
Related Procedures or Events of AE

#1 Surgical = 34.2%

#2 Medication and fluid-related = 23.6%
Preventable Adverse Drug Events

Examples:

- **Digoxin toxicity in patient with chronic renal failure**
- **Sub-therapeutic anticoagulation in a patient with a mechanical heart valve**
- **Steroid dependent patient did not receive steroids in hospital leading to adrenal insufficiency.**
Canadian Results:

- 7.5% (or 187,500) patients in Canadian hospitals were seriously harmed by their care.
- As many as 9,250 to 23,750 people died in a Canadian hospital as a result of medical errors.
- 37% of adverse events were determined to be preventable.
Study recommendations:

- Improved reporting and monitoring of adverse events
- Application of relevant new technologies
- Improved communication and coordination among caregivers
But What About Critical Care

- **Prospective study of 4,031 patients**
- **Random sample in 11 medical and surgical units**
  - Included 2 medical and 3 surgical ICUs

- **Findings:**
  - 2X adverse drug events in ICUs
  - When adjusted for the number of medications, no differences
Andrews, Stocking et al. (Feb 1, 1997). An alternative strategy for studying adverse events in medical care. Lancet;349:309-14

- 1047 patients
- Attended all rounds, reports on patients
- 2 surgical ICUs and 1 surgical unit
  - AE = 45.8% of patients (total AE = 2183)
  - Serious AE = 17.7% of patients
- Likelihood of AE ↑ by 6% for each day in hospital
1 year prospective study
Non-university teaching hospital
1024 consecutive patients admitted to ICU
- Errors occurred in 15.7% of patients
- Errors ↑ ICU total stay by 425 patient days
- 15% of ICU time!


- Med-Surg 6 bed ICU, 4 months; incident reports & 24 hour observation
  - Average number of activities: 178/pt/day!
  - Error rate of 1.7% (excluded medical decisions)
  - BUT a severe or potentially detrimental error occurred on average of 2 x/day!
  - COMMUNICATION key issue
Critical Care Patients ARE at Higher Risk for Serious Consequences from Errors:

- More susceptible to serious outcomes
- Less able to recover
- Tend to receive multiple high-alert medications
- Most medications administered are IV
- Tend to receive more medications in total
  - Probability of numbers
- Complexity of care
- Patient involvement often less
Comparisons to Other Industries:
What if we had 99.9% Accuracy?

- 2 unsafe landings at O’Hare Airport/ day, extrapolated.....
- 16,000 pieces of mail lost/ day
- 32,000 bank cheques deducted from the wrong account each HOUR!

In healthcare:
- 50 babies dropped at birth everyday in the U.S.

(Deming, 1987)
Reported Errors (3-6%)

Errors NOT Reported
Lack of Reporting due to:

Many reasons including:

- Failure to recognize error
- Lack of certainty if it “really is an error”
  - definition (Related to harm)
- Punitive culture
  - Fear of reporting: self and others
Medication Errors: need to move away from “blame & shame”

- Who did it?  
- What allowed it?

- Punishment  
- Thank you for reporting!

- Errors are rare  
- Errors are everywhere

- Add more layers  
- Simplify/standardize

- Calculating error rates  
- No thresholds
Error investigations have always concentrated on *sharp end* (front line staff) where patient/caregiver interaction occurs. Contributing factors and latent errors often originate at the *blunt end* where organizational policies, procedures and resource allocation decisions are made.
Swiss Cheese Model

Patient receives wrong drug

Barriers & Safeguards against Errors

Multiple Demands on Attention

Inadequate Training and Skills Mix

Poor Lighting

Poorly Designed Order Forms

Poorly Designed Drug Packaging

Poorly Designed Storage facility

Latent Failures

(modified from James Reason, 1991)
Blaming Practitioners versus 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)
Culture Change

- Need to dispel the belief that healthcare workers are perfect
- Leadership
- Eliminate “shame and blame” & fear
Culture Change cont’d

- Promote effective team functioning & communication
- Job design based on system’s approach
  - avoid reliance on memory and sustained attention
  - simplify and standardize processes
- Create a learning environment
Culture Change cont’d

- Anticipate mistakes will be made
  - Prevention strategies
  - Make errors visible
  - Design for recovery
High-Alert Medications: Errors causing the most serious harm

- Insulin
- Free flow IV pumps
- PCA devices
- Parenteral narcotics
- Lidocaine
- Cancer chemotherapy
- Neuromuscular blockers
- Conscious sedation
- Concentrated electrolytes (potassium, magnesium, phosphate)

high-alert medication list available at:  www.ismp.org/MSAarticles/highalert.htm
Bulletins from Error Reports:

- Adrenergics (Nov. 2002; Apr. 2004)
- NMBs (Dec. 2002; ???: 2004)
- Epidural Infusion (January 2003)
- Insulin (Apr. 2003)
Uncounted thousands of Canadians die each year because of avoidable medical errors. A program is just beginning to monitor the errors and eliminate the causes.

Mistakes That Kill

BY DIANA WILEY

ON JULY 30, 1996, Nancy Brown witnessed her son's death by the same lethal injection that is used for executions in the United States—potassium chloride. The setting, however, was no death row but the supposedly curative premises of Leamington District Memorial Hospital in southwestern Ontario. Jeffrey Brown, 33, undergoing treatment for a kidney infection, was chatting with his mother and a friend when a nurse arrived with a medication cart. Brown was supposed to receive an injection of Lasix, a drug used to reduce swelling caused by excess bodily fluids. Instead the nurse somehow took a vial of concentrated potassium chloride from a drawer in the cart, filled a 20-cc syringe and injected the lethal chloride into the arm. Jeffrey Brown died minutes later. The nurse, who had 18 years experience, was charged with criminal negligence. Two and a half years later, she was cleared of all charges. Nancy Brown is still trying to make sense of this "unfinished business," as she calls it. "My son died in a public institution and no one's been held accountable," she says. "I cannot heal until I am certain there are practices and procedures in place to prevent this ever happening again."

CLEARLY, THERE AREN'T. In hospital settings, where the guiding principle is the Hippocratic injunction "First, do no harm," thousands of Canadians—credible estimates range as high as 10,000 per year—are dying as a result of medical error. A further 10,000 deaths may result from infections acquired in hospitals and unanticipated complications from medications. Add to this an estimated 20,000 medication-related
60 Regular Insulin now

Lydion 0.1 mg p.o.
Dy 0.125 mg p.o. qid
Minit 5 mg p.o. qid
Foley cathete
wit's said
US. 45 NS 75 cc IV, add 0.9 meq/l

after patient voids.

Bicillin 600,000 IU, IM x dosage
Urine test & each meal + noct
Medic: Cal 25mg q4hs
Hydropsis 25mg qid + tablet
Keto-Squid & capsule
2 K6
Urinalysis

Synthroid long
RUN 0.5ML/H
Standardize Order Communication

- Use leading zero (0.1 mg not .1 mg)
- No trailing zeros (1 mg not 1.0 mg)
- Avoid nonstandard abbreviations (“U” for unit, q.d., drug name abbreviations such as “MS”)
- Drug protocols and standard order forms
  - handwriting eliminated; choices- best practices; can incorporate error reduction strategies
Confirmation Bias

It leads one to “see” information that confirms our expectation rather than to see information that contradict our expectation.
What if you are given the hint “Alphabet” or “A”? 
If you are given the hint “NUMBER”, what comes to mind?
The power of the human mind

According to a research at Cambridge University, it doesn't matter in what order the letters in a word are. The only important thing is that the first and last letter be at the right place. The rest can be a total mess and you can still read it without problem. This is because the human mind doesn't read every letter by itself, but the word as a whole.

Amazing huh?
Differentiate:

- Feel different, look different
  - ordering from different manufacturer’s
  - use of different sizes
  - auxiliary labels

Tall Man Lettering
vincristine
vinblastine

vinCRISTine
vinBLASTine
Changes Needed to Improve the Medication Use Process

- Need to be proactive vs reactive
- Use external information learned from other organizations
- Eliminate any use of “low error rates” reported as a quality measurement
- Implementation of proper error tracking methods
- Non-punitive approach
Where Medication Errors Occur…

PRESCRIBING
39% of errors

TRANSCRIPTION
12% of errors

DISPENSING
11% of errors

ADMINISTERING
38% of errors
What can we do?

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.”

Margaret Mead
(as quoted by Helvarg, 1995)
What we can do?

- Ensure orders are complete
- Do not use/ accept dangerous abbreviation
- Develop culture of safety
  - Report errors/ near misses/ hazardous conditions
  - Amongst ourselves

What we can do?

- Medication reconciliation
  - transfers
- Authority gradient challenge
- Read back/ repeat back orders (e.g., “five zero”)
What we do?

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

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

What can we do?

- Embrace patient/ family into process
- Avoid work-a-rounds
- **Trust your intuition!** “if it doesn’t feel right, it probably isn’t”
Safety converges with Best Practices and EBM

- Examples:
  - VAP
  - Sedation
  - DVT prophylaxis
Rank Order of Error Reduction Strategies for Hospitals

1. Forcing functions and constraints
2. Automation and computerizationization
3. Simplify, standardize and differentiate
4. Reminders, check lists and double check systems
5. Rules and policies
6. Education
7. Information
8. Punishment (no value)
Constraint:
Computerization/ Automation
Computerized Physician Order Entry:

- Prescriber orders are electronically inputted and sent
  - Most things that happen in hospitals occur as a result of orders
- Nursing transcription eliminated
- Therapeutic prescribing optimization
- Lab and diagnostic interface (Reminders, Alerts)
- Current & past orders easily reviewed
Bar Coding

- provides a safeguard against errors at the most vulnerable stage of the medication process-administration
- can save lives and dollars while increasing overall staff efficiency
Bar Coding
Accurate Administering

Automated bedside verification

- Ensures accuracy in medication, dosage, patient, time against prescribers order
- Provides legible on-line MAR
- Enhances team communication
Bar Code and Medication Administration

- Between 1993 and 1999:
  - 74% improvement in wrong drug errors
  - 57% improvement in wrong dose errors
  - 91% improvement in wrong patient errors
  - 92% improvement in wrong time errors
  - 70% improvement in missing doses.

Malcolm, B. et al. HIMSS Annual Meeting, November 30, 1999
Bar-code potential limitations:

- Patients without name bracelets or inaccessible
- Orders written/transcribed/entered on wrong patient
- Sensitivity of bar code scanner and ability to scan on curved surfaces
Smart Pumps examples:

- Medley by Alaris
  - Protect against harm at the point of infusion delivery and
  - Promote best practice guidelines

- Colleague CX by Baxter
Smart Pumps

- Comprehensive drug libraries to accommodate hundreds of drugs
- Specific for care areas
- Detects and warns out-of-range dose
- Maximum and Minimum dose and infusion rate
- Intervention Log
- CQI Report
“Technically the biggest ‘safety system’ in healthcare is the minds and hearts of the workers who keep intercepting the flaws in the system and prevent patients from being hurt. They are the safety net, not the cause of injury”.

Don Berwick