Preventing Medical Errors – What OHN’s Need to Know

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Objectives

- Examine sources and types of medical errors.
- Identify error-prone situations.
- Relate theories and strategies to reduce the occurrence of errors and improve patient outcomes.
- Define sentinel event, root cause analysis, and failure mode, effects, and criticality analysis.
- Discuss safety needs of special populations.
- Describe the impact of medical errors on healthcare providers.
- Discuss the importance of public education in reducing errors.
In a span of only a few hours, nurses at a Florida hospital operated by the giant Tenet Healthcare Corporation mistakenly gave two pregnant women a drug commonly used to force dead fetuses out of the womb. One woman lost two unborn twins and the second gave premature birth to a daughter who suffered severe brain damage.

Prescribed Amoxicillin and patient was allergic to PCN.
Examples

- In September 2010, Kimberly Hiatt made a medical error. The critical care nurse at Seattle Children's Hospital miscalculated and gave a fragile 8-month-old baby 1.4 grams of calcium chloride, 10 times the correct dose of 140 milligrams.

- The mistake contributed to the death of the child and led to Hiatt's firing and an investigation by the state's nursing commission. In April 2011, devastated by the loss of her job and an infant patient, Hiatt committed suicide.
The Joint Commission’s
2018 National Patient Safety Goals

- **Goal 1:** Improve the accuracy of patient identification — use two patient identifiers; eliminate transfusion errors.

- **Goal 2:** Improve the effectiveness of communication among caregivers; provide timely reporting of critical tests and critical results.
The Joint Commission’s 2018 National Patient Safety Goals

Goal 3: Improve the safety of using medications —

- label all medications;
- reduce harm from anticoagulation therapy.
- Maintain and communicate accurate patient medication information (medication reconciliation) across the continuum of care — compare current and newly ordered medications;
- communicate medications to the next provider;
- provide a reconciled medication list to the patient;
- explain the importance of managing medication information to the patient when he or she is discharged from the hospital or at the end of an outpatient encounter.
The Joint Commission’s
2018 National Patient Safety Goals

- **Goal 7:** Reduce the risk of healthcare-associated infections —
  - meet hand hygiene guidelines;
  - prevent multidrug-resistant organism infections;
  - prevent central line-associated blood stream infections;
  - prevent surgical site infections;

- **Goal 15:** The organization identifies safety risks inherent in its patient population;
  - identifies individuals at risk for suicide.
The Joint Commission’s **2019 National Patient Safety Goals** in addition too

- Identify patients correctly
  - 2 identifiers
  - Correct patient receives correct blood in transfusion

- Improve staff communication
  - Before procedures check meds
  - Take extra care with patients on blood thinners
  - Record and pass along correct information
The Joint Commission’s 2019 National Patient Safety Goals in addition too

- Use medicines safely
  - Before procedures check meds
  - Take extra care with patients on blood thinners
  - Record and pass along correct information

- Use alarms safely
  - Ensure working order and answer timely
The Joint Commission’s 2019 National Patient Safety Goals in addition too

- Prevent infection
  - Hand cleaning guidelines from CDC
  - Prevent infections that are difficult to treat
  - Prevent infections of the blood and central lines
  - Prevent infections post surgical
  - Prevent infections UTI’s from catheters
The Joint Commission’s **2019 National Patient Safety Goals** in addition to:

- Identify patient safety risks
  - Screen for suicide precautions

- Prevent mistakes in surgery
  - Correct surgery on correct patient and place
  - Mark correct place on patient’s body
  - Pause or “time out” to ensure mistake is not being made
Two types of errors

- Errors of *omission*: result from actions not taken
  - such as a patient fall
  - or even suicide because of a lapse in observation or supervision
Two types of errors - continue

- Errors of *commission* that stem from wrong actions taken
  - such as giving a patient an incompatible type blood
  - administering a medication in the wrong eye
  - or failing to label a spinal fluid specimen correctly.
Who do they affect

Nurses
Physicians
Pharmacists
Administrators
Laboratory technicians
Medical device manufacturers
Patients and family members
Nurses in particular may equate errors with failure;
- breach of trust between themselves,
- patients and physicians;
- and with harming patients, despite the desire and ethical mandate to “do no harm.”
- The associated horror and fear of punishment make nurses reluctant to report errors. While they fear for patients’ safety, they also dread disciplinary action from supervisors and employers.
Mistrust of supervisors and others in their employing agencies and fear of losing their jobs and the resulting economic consequences can result in not reporting every incident. However, underreporting and failing to report near misses, when patients narrowly avoid adverse events, contribute to the likelihood of serious patient harm.
Nurses & Errors

Nurses are often involved in errors simply because they participate in so many care activities or are the last people in a series of events in which mistakes were made.

Despite fears about malpractice lawsuits, many nurses recognize the benefits of reporting these mistakes. Along with other healthcare providers, they share the responsibility of reporting errors and near misses. Patient safety is their ultimate concern; being accountable for errors is in the interest of safety.
Acknowledgment and Accountability

- Covering up errors is never harmless.
- Nurses who decide not to report them become their own judges, thus eliminating the possibility of investigation that might prevent similar errors.
- Failure to report errors is also a violation of the standard professional care owed to patients and may subject nurses to increased legal liability.
Reality

- But it’s no wonder that underreporting has been the norm\textsuperscript{14} and prevails among nurses and other clinicians. They recall how professional staff treated them previously. One nurse shares a typical experience: “I reported [my error] to the head nurse, who humiliated me in front of my peers. I was a new grad.”

- The reality is that punishment reduces reported errors and does not facilitate prevention of recurrence or instill a culture of safety.
Rather than blaming nurses, administrators and review boards should take errors out of the blame-discipline structure and move them to a just culture. Elements of the just culture model, in which individual accountability is emphasized and discipline is reinstated include:

- Human error.
- Negligent conduct.
- Reckless conduct.
- Intentional rule violations.
In this model, responses to errors are framed by the nature of the event and the responsibility of providers in the occurrence. A just culture incorporates both a learning culture in which improvement efforts target system redesign and a reporting culture whereby staff feel safe from retribution and report issues about safety concerns. To read more about just culture, patient safety and The Just Culture Algorithm, go to [www.medscape.com/viewarticle/714617](http://www.medscape.com/viewarticle/714617).
Just Culture

- Nurses, perhaps along with everyone else, need to accept the fact that good clinicians do make mistakes.
- It’s possible that improved communication between physicians and nurses may foster autonomy and ultimately improve patient safety as nurses make patient-care decisions.
- All providers must accept that there are issues inherent in their roles as healthcare workers that contribute to error-prone environments.
Just Culture

- Report all errors may - better serve patients and all healthcare providers.
- Serious errors can be life-threatening or cause permanent harm, they often warrant immediate nursing and medical intervention.
- A patient may need more frequent monitoring, further diagnostic studies or more intensive nursing in a critical care unit. And documenting each intervention may protect nurses in the event of malpractice litigation.
For years, The Joint Commission has asked healthcare agencies to report sentinel events. As defined by The Joint Commission, a **sentinel event** is an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase “or the risk thereof” includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome.
Types of Errors and Sentinel Events

Sentinel events signal the need for immediate investigation and response.

Not all sentinel events occur because of an error, and not all errors result in sentinel events. Intense analysis is required for confirmed transfusion reactions, significant adverse drug reactions and significant medication errors.
The Joint Commission must review events that have resulted in an unanticipated death or major permanent loss of function not related to the natural course of the patient’s illness or underlying condition, or if the event is one of the following:

- Suicide of any patient receiving care, treatment and services in a staffed-around-the-clock care setting or within 72 hours of discharge.
- Unanticipated death of a full-term infant.
- Abduction of any patient receiving care, treatment, and services.
- Discharge of an infant to the wrong family.
- Rape.
Joint Commission- cont.

- Hemolytic transfusion reaction involving administration of blood or blood products having major blood group incompatibilities.
- Surgery and non-surgical invasive procedure on the wrong patient, wrong site or wrong procedure.*
- Unintended retention of a foreign object in a patient after surgery or other procedure.
- Severe neonatal hyperbilirubinemia (bilirubin >30 milligrams/deciliter).
Prolonged fluoroscopy with cumulative dose greater than 1,500 rads to a single field or any delivery of radiotherapy to the wrong body region or more than 25% above the planned radiotherapy dose.

All events of surgery on the wrong patient or wrong body part are reviewable under the policy regardless of the magnitude of the procedure or the outcome.
Sentinel Events

- Sentinel event reports have increased dramatically between 1995 and 2011. The Joint Commission has released an analysis of 5,381 sentinel events reviewed since 2004. From 2004 through June 30, 2011, most of these events (64.4%) occurred in hospitals, while 11.4% were reported in psychiatric hospitals.
Sentinel Event Numbers

- Abduction (22)
- Anesthesia-related event (76)
- Criminal event (211)
- Delay in treatment (604)
- Dialysis-related event (6)
- Elopement (65)
- Fall (408)
- Infant discharge to wrong family (2)
- Fire (76)
Sentinel Event Numbers – con’t

- Infection-related event (130)
- Inpatient drug overdose (50)
- Maternal death (90)
- Medical equipment related (151)
- Medication error (310)
- Operative/postoperative complication (570)
Other unanticipated event* (326)
  - Perinatal death/injury (185)
  - Radiation overdose (23)
  - Restraint-related event (99)
  - Self-inflicted injury (37)
  - Severe neonatal hyperbilirubinemia** (3)
  - Suicide (518)
  - Transfer-related event (17)
  - Transfusion error (86)
  - Unintended retention of a foreign body** (546)
  - Utility system failure (4)
  - Ventilator death (32)
  - Wrong patient, wrong site, wrong procedure (734).
Threats to Safety

- Threats to patient safety exist in common causes of patient injuries. Examples of such error-prone situations include:
  - When patients have impaired strength, flexibility or cognition.
  - Blood product transfusion.
Threats to Safety

Medication ordering and delivery processes, especially for high-alert medications, such as:
- Colchicine injection.
- Epoprostenol (Flolan), IV.
- Insulin, subcutaneous and IV.
- Magnesium sulfate injection.
- Methotrexate, oral, nononcologic use.
- Opium tincture.
- Oxytocin, IV.
Threats to Safety

- Nitroprusside sodium for injection.
- Potassium chloride for injection concentrate.
- Potassium phosphates injection.
- Promethazine, IV.
- Sodium chloride for injection, hypertonic (greater than 0.9% concentration).
- Sterile water for injection, inhalation, and irrigation (excluding pour bottles) in containers of 100 mL or more.
Factors in Medical Errors

- Multiple procedures/multiple surgeons.
- Communication breakdowns.
- Time pressures.
- Incomplete preoperative assessments.
- Organizational cultural factors not conducive to promoting teamwork, such as an attitude that surgeons’ decisions should never be questioned.
Factors

Factors that contribute to errors:

- Staffing issues
- Distraction factors
- Unavailability of pertinent information, such as X-rays and other imaging studies in the OR
- Cultural issues in an organization
Ineffective communication compromises patient safety and is a leading cause of errors. Communication breakdowns have been linked to many sentinel events, and effective communication has been singled out as critical to patient safety. Important risk factors include:

- Language barriers associated with culture and ethnicity.
- Socioeconomic variables, such as education, literacy and income.
- Gender differences among providers and patients.
- Personality differences.
Other Causes

- Other causes of errors are more general. In addition to a breakdown in communication among healthcare providers, errors may stem from
  - inadequate documentation,
  - a failure to follow or a lack of established policies and protocols, staffing patterns and human error.
- Appropriate nurse staffing and shift work are also linked with adverse events.
Preoperative and Operative Problems

- In the case of operative and postoperative complications, The Joint Commission found six specific causes related to two general problems of communication and protocols:
  - Necessary personnel not available when needed.
  - Incomplete preoperative assessment.
  - Deficient credentialing and privileges.
  - Inadequately supervised house staff.
  - Inconsistent postoperative monitoring procedures.
  - Failure to question inappropriate orders.
For many years, healthcare agencies have monitored their medical error rates, and nurses have been involved in the documentation of errors.

Error data collection and analysis have occurred for the most part on an institutional basis.

Incident reports, often the most common written record, have been seen as punitive and as public notice of mistakes made at work. Nevertheless, many clinicians use this vehicle for reporting errors in the workplace.
The reporting of medical errors and action plans to correct the problems have been increasingly on the national agenda. Some organizations have taken healthcare institutions to task as they invited voluntary reporting of healthcare mistakes. Two guiding frameworks for analysis have emerged to strengthen efforts devoted to improving patient safety:

- root cause analysis (RCA) and
- failure mode effect analysis (FMEA).
Root Cause Analysis

- Root cause analysis (RCA) is a process used to identify factors that underlie variations in performance, especially those associated with sentinel events.
- Incidents that result in serious physical or psychological injury or death are sentinel events.
- A serious error triggers an investigation aimed at improving systems and processes to reduce the likelihood of such an event in the future.
Root Cause Analysis

- The Joint Commission requires healthcare agencies to conduct an RCA following the discovery of a sentinel event.
- A root cause is the most fundamental reason for the failure or inefficiency of a process. This process pinpoints causative factors that bring about variations in performance, including the actual occurrence or possible occurrence of a sentinel event. Frequently, RCA is used after the fact to discover why problems occurred. However, some institutions are encouraging the use of RCA to prevent errors. Actions for improvement are specified and composed into action plans.
A sentinel event sets the RCA process in motion. For example, a physician who prescribed indomethacin (Indocin) for a patient who was allergic to aspirin did not know about the crossover sensitivity between the two medications. A nurse who subsequently administered the drug also did not connect the aspirin allergy with indomethacin. The patient suffered a respiratory arrest and died. Following protocol, this sentinel event was reported to The Joint Commission within five days of discovery. An RCA was conducted, and an action plan was developed to prevent a recurrence. The Joint Commission received and reviewed the report. The agency maintained the RCA and action plans in confidence.
The intention of RCA is to discover the hidden causes of error. Healthcare providers look beneath the surface of error events to get at the sources or most important reasons for mistakes. They persistently search for causes so that they are satisfied they have explained the event as logically as possible.
Goals of Root Cause Analysis

A. Identifying healthcare errors for the public.
B. Examining the culture of the workplace.
C. Addressing performance deficits of providers.
D. Reducing the risk of future, similar events.
RCA Focuses On

A. Problems with provider compliance.
B. Predictors of serious medication errors.
C. Factors resulting in performance variations.
D. Interdisciplinary collaboration in hospitals.
Root Cause Analysis

The cross-disciplinary team mobilized during a RCA reflects the fact that healthcare errors —

A. Involve numerous causes, occurrence issues, and environmental barriers.

B. Call for a sustained changeover to a culture of safety.

C. Include safety threats shared by many stakeholders in agencies.

D. Require redundancies that require leadership and control.
Failure Mode Effect Analysis

- Failure mode effect analysis (FMEA) is a theory of error prevention that fosters safety in systems and the prevention of accidents.
- FMEA assumes that errors are not only possible but also even likely despite knowledgeable and careful healthcare professionals.
- This theory takes the onus for preventing errors off individuals by using an interdisciplinary group to engage in a never-ending process of quality improvement to assess and correct areas where errors are likely.
At checkpoints in each step of the process, FMEA strategies build redundancies that serve as safety nets or error traps. For example, when administering medications, nurses may be required to read containers three times or have a second nurse check their work. Other checkpoints along the medication administration process where safety net strategies may be applied could be when:

- A provider writes a prescription, a unit clerk reads and transcribes the order, and a nurse checks the clerk’s work.
A pharmacy technician reads, transcribes and enters an order into the computer; a technician prepares doses for dispensing; and a pharmacist checks the technician’s work.

A pharmacist dispenses medications, and a nurse checks the pharmacy’s dispensing accuracy and medication doses before they are administered, or when the patient checks doses before they are administered.

A pharmacist investigates why doses are returned or not administered.
Another example applied to preventing pump programming errors tested a dose-error reduction system with a predefined drug library with dose limits for each drug. Selected recommended actions were:

- Keypad backlighting and alerts for when a rate or dose is out of range.
- Nurse training to use a calculator on the pump.
- Set pump question to clarify patient new to pump versus hospital.
- Develop profile for code situations.
- Enforce double check.
- Preprinted drug labels to identify tubing above and below the IV pump.
- Use tubing separators.
- Place concentrations on one screen.
Strategies

- Additional safety net strategies might include:
  - Eliminating dangerous items from floor stock.
  - Limiting use or access to stored drugs in the pharmacy.
  - Building in safeguards to avoid confusing sound-alike or look-alike drugs.
  - Adopting a lock-and-key design for IV equipment.
  - Using tactile cues and special packaging for medications.
Preventing Errors and Improving Patient Outcomes

- Safety net strategies are as numerous as the causes of medication errors.
- To start, nurses should structure their work environment to reduce the probability of error.
- Some hospitals have created medication administration areas called quiet zones that encourage nurses to discourage conversation.
- Separate supplies of look-alike medications and store them away from toxic chemicals.
Preventing Errors and Improving Patient Outcomes

- Hospitals are expected to take action to reduce look-alike/sound-alike misunderstandings, such as grouping drugs by category instead of alphabetical order, placing reminders in computerized systems and on labels of medication containers and checking the label against the patient’s chart before giving the dose to the patient.

- Remove dangerous drugs, such as neuromuscular blocking agents and concentrated potassium chloride, from floor stock, and discard out-of-date drugs.

- Encourage pharmacists to purchase oral liquids in unit dose packages only. Remove concentrated electrolytes from patient care units. Creating computer-based forms for parenteral nutrition orders helps clinicians with the ordering process.
Preventing Errors and Improving Patient Outcomes

- **Universal Protocol for Preventing Wrong Site, Wrong Procedure and Wrong Person Surgery:**
  - Conduct a pre procedure verification process; mark the procedure site; perform a time out before procedure.
Medical Terminology

- When writing orders or prescriptions, providers should:
  - Use only standard abbreviations.
  - Write a zero before a decimal point dose (e.g., 0.5 mL, not .5 mL).
  - Avoid a “trailing zero” (e.g., 0.5 mcg, not 0.50 mcg.)
look-alike abbreviations of QD, QOD, U, IU or HS should be eliminated and included on a “do not use” list. The Joint Commission has developed a “do not use” list of abbreviations in association with its National Patient Safety Goals.

In addition to leading and trailing zeros, QD, QOD, IU and U mentioned above, the following unauthorized abbreviations will be checked for by surveyors when they read providers’ orders and medication administration records:

- MS and MS₄₀ should be written out as morphine sulfate.
- MgSO₄ should be written out as magnesium sulfate.
Medical Terminology

- Also, do **not** use:
  - Apothecary units.
  - `< or >` (use less than or greater than).
  - `@` (use at).
  - `cc` (use mL or milliliters).
  - `µg` (use mcg or micrograms)
SBAR

- Communication breakdowns among healthcare providers can result in errors. The SBAR (Situation-Background-Assessment-Recommendation) technique helps clinical teams connect when communicating about patients’ conditions and helps to frame conversations that call for immediate response.
- SBAR is used when the listener repeats the message back. Additional research needs to evaluate the effect of SBAR training. Moreover, teamwork training and education may improve the safety of healthcare agencies.
- Accepting the role and contributions of team members, reducing barriers that status imposes and behaving at work with respect for all team members will affect patient safety. (For more information on SBAR communication and an example of an SBAR Tool Kit, go to [www.azhha.org/patient_safety/sbar.aspx](http://www.azhha.org/patient_safety/sbar.aspx).)
Clinical decision-making is supported by computerized physician/provider order entry systems. CPOE systems:

- Intercept errors when they most commonly occur at the time medications are ordered.
- Prompt warnings against the possibility of drug interaction, allergy or overdose.
- Give accurate, up-to-date information on new drugs.
- Provide drug-specific information, eliminating confusion from drug names that sound alike.
- Improve communication between physicians, nurse practitioners and pharmacists.
- Increase efficiencies.
Automatic dispensing systems free some of pharmacists’ time from dispensing medications by making drugs available to nurses at the point of care. Root causes of medication errors related to automated medication dispensing machines include:
- Machines filled with wrong product.
- Different products mixed in same drawer.
- Inadequate or lack of double checks when restocking.
- Unused medication returned to wrong place.
Point of Care –con’t

- Inattention to product label.
- Errors in data entry to gain access.
- Ability to override medication-use process safeguards.
- Lack of pharmacist review of order.
- Deterioration of medication (i.e., past expiration, incorrect storage temperature).
- The benefits and the threats of technology must be consistently evaluated.
Infections

- Effective hand washing has been linked to improved morbidity and mortality rates. Central venous catheter bloodstream infection, catheter-associated urinary tract infection and surgical site infection counts are being monitored by unit in hospitals along with staff compliance with effective hand washing. Sink availability and convenient paper towels in sink areas prevent nosocomial infections. The Centers for Disease Control and Prevention provided revised hand hygiene guidelines to reduce organism transmission, thus protecting patients. These guidelines include:
  - Using alcohol-based hand rubs.
  - Washing hands with traditional soap and water.
  - Avoiding artificial nails.
  - Keeping natural nails less than one-quarter of an inch long.
  - Changing gloves between patient.
The Agency for Healthcare Research and Quality offers 10 patient safety tips, distilled from research, to increase patient safety:

- Survey staff in individual units and throughout the hospital on the need to assess and improve the culture of patient safety.
- Limit shifts of more than 24 hours for medical residents, and make sure they do not drive home after working extended shifts.
- Eliminate the tradition of shifts of more than 30 consecutive hours by interns working in hospital ICUs.
- Adopt interventions to reduce the incidence of ventilator-associated pneumonia in critically ill patients.
10 Patient Safety Tips – con’t

- Count surgical instruments and sponges before and after procedures, and X-ray patients after surgery to reduce the likelihood of objects being left inside patients.
- Use senior nurses and maintain appropriate round-the-clock staffing levels in ICUs to prevent airway tube complications.
- Ensure that personal digital assistant-based drug information is readily available at the point of care.
- Download free software tools to identify ways to improve medication safety in the ambulatory care setting.
- Use computer-based order entry to reduce catheter-related urinary tract infections.
- Minimize interruptions and other distractions faced by the nursing staff in their day-to-day routines.
5 Rights

- We need to continue to encourage the use of the 5 RIGHTS:
  - Right patient.
  - Right drug.
  - Right dose.
  - Right route.
  - Right time.
Hospitals

- Hospitals are now using scanners to assist with some of the five rights. Prior to a medication being administered, the nurse is required to scan the patient’s arm band.
- They then ask the patient their name and another identifier. Then the medication to be administered is scanned and reviewed with the patient.
- This is a good time to educate the patient on the use of the medication, reason or it’s use, possible side effects and any education needed for the patient to safely use at home after discharge.
Accountability for Reporting and Investigating

Medical errors and near misses must be reported as soon as they are discovered.

Nurses or other providers involved in errors may be the first who report them when noticing a change in patients’ conditions that indicates an accident happened.

The dissemination of the *just culture* approach in which personal accountability results in increased reporting will decrease errors. Additional nursing research will contribute to patient safety outcomes.

Because of their proximity to patients and families, nurses are in a unique position to identify and carry out patient safety research. Many are conducting research on nurse-sensitive outcomes addressing patient safety.
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