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Contact Hours: **2**

Prevention of Medical Errors for Florida Healthcare Professionals

BY Judith Swan, MSN, BSN, ADN, RN; Nancy Evans, BS

LEARNING OUTCOME AND OBJECTIVES: Upon completion of this course, you will understand current, evidence-based interventions to prevent medical errors in the practice setting. Specific learning objectives to address potential knowledge gaps include:

- Define medical errors and associated terminology.
- Describe factors that impact the occurrence of medical errors.
- Review the most common medical errors and processes to improve patient outcomes.
- Identify populations with special vulnerability to medical errors.
- Discuss Florida's statutory requirements for addressing medical errors.

INTRODUCTION

It would seem obvious and essential that every healthcare encounter a person has should be safe and free from harm. Unfortunately, this is not always the case. Although the vast majority of Americans are having positive experiences with the healthcare system, many report having personally experienced a "medical error." Errors occur in hospitals, clinics, surgery centers, dialysis centers, medical offices, dental offices, nursing homes, pharmacies, and even in patients' homes—anywhere patients receive care.

Medical errors are a serious public health issue, with every patient involved in the healthcare system a potential recipient of harm. Injuries and death can occur, for example, when patients receive a wrong medication or dose of medication, experience mistakes in surgery, receive treatments meant for another patient, experience a fall in the hospital, develop a pressure injury, or are subjected to a misdiagnosis, misinterpreted medical order, or equipment failure.

Errors can occur at any point while in the healthcare system. Analyzing why medical errors happen has traditionally been focused on the human factor, concentrating on individual responsibility for making an error, and the solutions have involved training or retraining, additional supervision, or even disciplinary action. The alternative to this individual-centered approach is a system-centered approach, which assumes that humans are fallible and that systems must be designed so that humans are prevented from making errors.

Acknowledging that errors happen, learning from them, and working to prevent errors in the future are important goals and represent a major change in the culture of healthcare—a shift from blame and punishment to analysis of the root causes of errors and the creation of strategies to reduce the risk of errors. In other words, healthcare organizations must create a culture of safety that views medical errors as opportunities to improve the system. Every person on the healthcare team has a role in making healthcare safer for patients and workers (Rodziewicz et al., 2021).

DEFINING MEDICAL ERRORS

A **medical error** has been defined as the failure of a planned action to be completed as intended or the use of a wrong plan or action to achieve an aim. Errors can include problems in practice, products, procedures, and systems.

Errors are further described as **adverse events**. Important subcategories of adverse events include:

- **Preventable** adverse events can be avoided by any means currently available unless the means is not considered standard care.
- **Unpreventable** adverse events result from a complication that cannot be prevented.
- **Ameliorable** adverse events are not preventable but the severity of injury could have been substantially reduced if different actions or procedures had been performed or followed.

  (AHRQ, 2019a)

In addition to adverse events, other terms used to describe medical errors include *near misses*, *sentinel events*, and *never events*.

Near Misses

A near miss is any event that could have had adverse consequences but did not and was indistinguishable from fully fledged adverse events in all but outcome. In a near miss, an error was committed, but the patient did not experience clinical harm, either through early detection or sheer luck (AHRQ, 2019a).

Sentinel Events

A sentinel event is identified by the Joint Commission Sentinel Event Policy as an event that reaches a patient and results in any of the following:

- Death
- Permanent harm
- Severe temporary harm and intervention required to sustain life
  (TJC, 2021)

Not all sentinel events occur because of an error, and not all medical errors result in sentinel events. Sentinel events can include:

- Suicide of any patient receiving care, treatment, or services in a staffed, around-the-clock care setting or within 72 hours of discharge, including from the emergency department
- Unanticipated death of a full-term infant
- Discharge of an infant to the wrong family
- Abduction of any patient receiving care, treatment, or services
- Any elopement of a patient from a staffed, around-the-clock care setting leading to death, permanent harm, or severe temporary harm of the patient
- Rape, assault, or homicide of any patient receiving care, treatment, or services, or any staff member, licensed independent practitioner, visitor, or vendor while on site
- Surgery or other invasive procedure performed at the wrong site, on the wrong patient, or that is the wrong (unintended) procedure for the patient
- Unintended retention of a foreign object in a patient after an invasive procedure, including surgery
- Severe neonatal hyperbilirubinemia
- Prolonged fluoroscopy to a single field or any delivery of radiotherapy to the wrong body regions or delivery of the wrong radiotherapy dose
- Fire, flame, or unanticipated smoke, heat, or flashes occurring during direct patient care caused by equipment operated and used by the hospital (staff do not need to be present)
- Any intrapartum maternal death
- Sexual abuse/assault involving a patient and another patient, staff member, or other perpetrator while being treated or on hospital premises
  (TJC, 2021)

Never Events

The National Quality Forum has compiled a set of 29 **serious reportable events (SREs),** which are consequential, largely preventable. Such events are also called *never events*—events that should never happen. SREs can be grouped into seven categories, as follows:

- Surgical SREs (e.g., surgery performed on wrong body parts or the wrong patient, or wrong surgical/invasive procedure performed on a patient)
- Product/device SREs (e.g., patient death/serious injury associated with use of devices provided by the healthcare setting)
- Patient-protective SREs (e.g., patient elopement or suicide while in a healthcare setting)
- Care management SREs (e.g., patient death/serious injury associated with a fall while in a healthcare setting, medication errors)
- Environmental SREs (e.g., patient death/serious injury associated with the use of restraints while in a healthcare setting, burns, electric shock)
- Radiological SREs (e.g., patient/staff death/serious injury associated with the introduction of a metallic object into an MRI area)
- Criminal SREs (e.g., sexual abuse/assault on a patient while in a healthcare setting) (NQF, 2021)

Active and Latent Errors

Active errors (human errors) are those that occur at the point of contact between a human and some aspect of a large system (e.g., a machine). They are generally readily apparent (e.g., pushing an incorrect button or ignoring a warning light) and almost always involve someone at the frontline.

Latent errors are accidents waiting to happen. They refer to a less apparent failure of organization or design that contributes to the occurrence of errors or allows them to cause harm to patients. They are errors in system or process design, faulty installation or maintenance of equipment, or ineffective organizational structure.

When a latent error combines with an active human error, an event occurs (AHRQ, 2019b).

COMMON MEDICAL ERRORS AND HOW TO PREVENT THEM

Medical errors are likely to occur in situations where providers are challenged to make decisions in dynamic, fast-paced, complex environments under tight time constraints. Errors stem from technical, organizational, or human factors that set off a chain reaction that could result in an adverse event (Carver et al., 2020).

The ten **most common causes of medical error** include:

1. Altered ability to make good judgments and quick decisions (e.g., misapplying expertise)
2. Ineffective communication (the most common cause)
3. Deficiencies in education, training, orientation, and experience
4. Inadequate methods of identifying patients, incomplete assessment on admission, failing to obtain consent, and failing to provide education to patients
5. Inadequate policies to guide healthcare workers
6. Lack of consistency in procedures
7. Inadequate staffing and/or poor supervision
8. Technical failures associated with medical equipment
9. No audits in the system
10. No one prepared to accept responsibility or change the system
(Rodziewicz et al., 2021)

Surgical Errors

Wrong-site, **wrong-procedure**, and **wrong-patient** surgical errors are relatively rare. It is estimated that in the United States such errors occur in approximately 1 of 112,000 surgical procedures and are infrequent enough that an individual hospital would only experience one such incident every 5 to 10 years. However, this includes only procedures performed in an operating room. If procedures performed in other settings such as ambulatory surgery are included, the rate of error may be much higher (AHRQ, 2019d).

Retained foreign bodies (also called *retained surgical items*) and unintentionally retained foreign objects are defined as objects retained after skin closure following an invasive procedure. Most unintended retained foreign bodies are associated with failures in leadership, communication, or other human factors that should be under the control of the operating team (Pellegrini, 2019).

Anesthesia-related adverse events may include inadvertent gas flow change, premature extubation, or breathing circuit connection error (Rayan et al., 2019).

PREVENTING SURGICAL ERRORS

The WHO **Surgical Safety Checklist** was developed after extensive consultation aimed at decreasing errors and adverse events, and increasing teamwork and communication in surgery. This checklist has gone on to show significant reduction in both morbidity and mortality and is now used by a majority of surgical providers around the world (WHO, 2021).

ELEMENTS OF THE WHO SURGICAL SAFETY CHECKLIST

A surgical checklist is an algorithmic listing of actions to be taken in any given clinical situation intended to make everyone aware that others expect these things to be done.

"SIGN IN" checklist must be completed orally and in writing before induction of anesthesia (with at least a nurse and anesthetist).

1. Has the patient confirmed their identify, site, procedure, and consent?
2. Is the site marked?
3. Is the anesthesia machine and medication check complete?
4. Is the pulse oximeter on the patient and functioning?
5. Does the patient have a:
    - Known allergy?
    - Difficult airway or aspiration risk?
    - Risk of >500 ml blood loss (7 ml/kg in children)?

"TIME OUT" checklist must be completed orally and in writing before skin incision (with nurse, anesthetist, and surgeon).

1. Confirm all team members have introduced themselves by name and role
2. Confirm the patient's name, procedure, and where the incision will be made
3. Has antibiotic prophylaxis been given within the last 60 minutes?
4. For the anticipated critical event:
    - To surgeon:
        - What are the critical or nonroutine steps?
        - How long will the case take?
        - What is the anticipated blood loss?
    - To anesthetist:
        - Are there any patient-specific concerns?
    - To nursing team:
        - Has sterility (including indicator results) been confirmed?
        - Are there equipment issues or any concerns?
5. Is essential imaging displayed?

"SIGN OUT" checklist must be completed orally and in writing before the patient leaves the operating room (with nurse, anesthesia provider, and surgeon).

1. Nurse verbally confirms:
    - The name of the procedure
    - Completion of instrument, sponge, and needle counts
    - Specimen labeling (read aloud specimen labels, including patient name)
    - Whether there are any equipment problems to be addressed
2. To surgeon, anesthetist, and nurse:
    - What are the key concerns for recovery and management of this patient?

(WHO, 2021)

Medication Errors

Every year in the United States, 7,000 to 9,000 people die due to a medication error. In addition, hundreds of thousands experience but often do not report an adverse reaction or other complication related to a medication (Tariq et al., 2021).

Medication errors may be due to human errors but often result from a flawed system with inadequate backup to detect mistakes. Medication errors may occur at any step, including:

- Ordering/prescribing. The clinician must select the appropriate medication, dose, frequency, and duration.
- Transcribing. In a paper-based system, an intermediary must read and interpret the prescription correctly.
- Dispensing. The pharmacist must check for drug-drug interactions and allergies and release the appropriate quantity of the medication in the correct form.
- Administering. The correct medication must be supplied to the correct patient at the correct time, either by a nurse, other trained staff, patient, or caregiver.
- Monitoring. This includes laboratory tests, side effects, effectiveness of therapeutic action, and vital signs.
- Documenting. The name, strength, and quantity of drug; the date and time administered; and the name of the person administering the drug must be entered in the patient's medication administration record in a timely manner.

  (Tariq et al., 2021)

PREVENTING ERRORS IN PRESCRIBING AND TRANSCRIBING

Errors occur most commonly during the ordering/prescribing and transcribing stages, accounting for almost 50% of medication errors. Even with the increasing use of electronic health records, which has helped avert errors at the ordering and transcribing stages, such errors continue to occur.

The first line of defense against medication errors should be the prescribing clinician, who must have all the information needed to make the best possible prescribing decisions for each patient. Strategies for preventing errors when prescribing include avoiding unnecessary medications by adhering to **conservative prescribing principles**, which include:

- Maintaining heightened awareness concerning side effects
- Exercising skepticism about new drugs
- Remaining alert for high-risk medications
- Involving the patient in decision-making
- Considering long-term impacts of medications prescribed
- Considering patient age and body weight
- Considering liver and kidney function

Use of a **computerized provider order entry (CPOE)** avoids the necessity for transcribing an order and thus reducing risk of error.

Medication reconciliation (reviewing each medication and comparing it against the medication administration record) can be performed at times of transitions in care between facility units or another facility, or upon discharge to home.

To reduce transcription errors, a **double-check procedure** is recommended in which another nurse on the same shift or incoming shift reviews all new orders to ascertain that each order is correctly noted and transcribed on the physician's order and on the medication administration record. **Read-back** to another professional is another procedure in which a nurse reads back an order to the prescribing physician or another nurse to make certain the medication ordered is correctly transcribed (APF, 2020; Saljoughian, 2020).

"DO NOT USE" ABBREVIATION LIST

Misreading medical abbreviations can be a cause of serious medication errors, and the Joint Commission has created a "do not use" list of abbreviations that endanger patients' safety and that it requires its members to follow.

JOINT COMMISSION "DO NOT USE" LIST
Applies to all orders and all medication-related documentation that is handwritten (including free-text computer entry) or on preprinted forms.

Do Not Use	Potential Problem	Instead Use
U, u	Mistaken for "0" (zero), the number "4" (four), or "cc"	Unit
IU	Mistaken for IV (intravenous) or the number 10 (ten)	International unit
Q.D., QD, q.d., qd	Mistaken for each other	Daily
Q.O.D., QOD, q.o.d, qod	Period after the "Q" mistaken for "I" and the "O" mistaken for "I"	Every other day
Lack of leading zero	Decimal point is missed	0.X mg
MS	Can mean morphine sulfate or magnesium sulfate	Morphine sulfate or Magnesium sulfate
MSO_4 and $MgSO_4$	Confused for one another	Magnesium sulfate
Trailing zero*	Decimal point is missed	X mg
* Exception: A "trailing zero" may be used only where required to demonstrate the level of precision of the value being reported, such as for laboratory results, imaging studies that report size of lesions, or catheter/tube sizes. It may not be used in medication orders or other medication-related documentation.		
(TJC, 2020)		

PREVENTING ERRORS IN DISPENSING

Dispensing medications involves preparing and packaging a prescription drug or device in a container and labeling the container with information required by state and federal law.

Dispensing errors in U.S. clinical and community pharmacies occur at an average rate of 4 in 250 prescriptions. Forty-one percent of all medication incidents related to information technology are due to choosing the wrong drug. One third of incidents are associated with confusion of similar drug names, and nearly half were associated with drug strength confusion.

The most **common causes** for dispensing errors involve:

- Workload
- Similar drug names
- Interruptions
- Lack of support staff
- Insufficient time to counsel patients
- Illegible handwriting
  (Tariq et al., 2021)

Strategies to reduce the risk of medication dispensing errors include:

- Verifying the prescription entry is correct
- Clarifying any ambiguous information such as prescriptions that are illegible or use nonstandard abbreviations and other symbols
- Checking prescriptions thoroughly and verifying by another person
- Providing patient counseling
- Checking for drug-to-drug interactions and allergies
- Supervising dispensing medications by pharmacist assistants
- Opening containers and showing them to the patient (patients may raise an alert if the medication looks different from what they usually take)
- Using tall-man lettering (TML), a technique that uses uppercase lettering to highlight the differences between similar drug names by capitalizing dissimilar letters (e.g., "CISplatin" vs. "CARBOplatin")
- Using barcode scanners to check whether the selected drug from the shelf is the same as the selected drug on the dispensing screen
  (Campmans et al., 2018; FDA, 2020)

PREVENTING ERRORS IN ADMINISTRATION

In the administration stage, errors include:

- Failing to follow the "**five rights**" to medication administration:
  - Right patient
  - Right drug
  - Right dose

  - Right route
  - Right time
- Failing to educate the patient as to why the drug is being prescribed
- Leaving a medication at the bedside without knowing if it was taken
- Omitting medications
- Administering an unauthorized medication
- Not shaking a medication that should be shaken before use, leading to overdose or underdose
- Crushing medications not intended to be crushed
- Failing to follow facility policies and procedures
  (Hanson & Haddad, 2020)

In inpatient settings, interventions to prevent medication administration errors include:

- Barcoding for both medications and patients
- Adherence to the "five rights" of medication safety
- Smart infusion pumps for intravenous administration
- Single-use medication packages
- Package design features such as tall-man lettering for look-alike drug names
- Minimizing interruptions

Few of these interventions are likely to be successful in isolation, and efforts to improve safe medication use must also focus on transitions to home, primary care, and patient caregiver understanding and administration of medication. These efforts include:

- Patient education
- Revised medication labels to improve patient comprehension of administration instructions
- Multicompartment medication devices for patients taking multiple medications in ambulatory or long-term care settings
  (AHRQ, 2019d)

PREVENTING ERRORS IN MEDICATION MONITORING

Monitoring and assessment are essential to the process of administration of medications. Monitoring involves observing the patient to determine if the medication is working, is being

used appropriately, and is not harming the patient. Types of errors in monitoring that can occur include:

- Failure to monitor effectiveness of therapeutic action of a medication
- Lack of awareness of side effects of a medication
- Failure to monitor, assess, and report laboratory tests
- Failure to monitor, assess, and report vital signs
- Failure to educate patients about potential side effects
- Failure to comply with a pain management program
- Communication failures during handoff procedures to accepting nurse
  (Tariq et al., 2021; AHRQ, 2019d)

PREVENTING ERRORS WITH HIGH-ALERT MEDICATIONS

High-alert medications are drugs that have a heightened risk for causing significant harm when used in error. The FDA requires such drugs be given a label referred to as *black box warning.* The Institute for Safe Medication Practices maintains a current listing of such medications and makes the following recommendations for reducing error:

- Standardize the ordering, storage, preparation, and administration of these medications.
- Improve access to information about these drugs.
- Limit access to high-alert medications.
- Use auxiliary labels and automated alerts.
- Employ redundancies—duplicate devices used for backup purposes to prevent or recover from the failure of a specific part of the process (e.g., asking another nurse to perform an independent check).
- In community/ambulatory settings, provide mandatory patient education.
  (ISMP, 2018)

Tubing Misconnections

The FDA reports that medical device misconnections can occur when one type of medical device is attached in error to another type of medical device that performs a different function. Tubing misconnections can occur for several reasons, including:

- Similar design of many connectors and the widespread use of connectors with similar shapes and in similar sizes

- Human error arising from conditions such as:
    - Multiple connections for one patient
    - Poor lighting
    - Lack of training
    - Time pressure
    - Fatigue
    - High-stress environment

  (FDA, 2018)

EXAMPLES OF TUBING MISCONNECTIONS

- Enteral feeding tube connected to an IV
- Enteral feeding tube connected to ventilator-inline suction catheter
- Blood pressure cuff tubing connected to an IV port
- IV tubing connected to trach cuff
- IV tubing connected to nebulizer
- Oxygen tubing connected to a needleless IV port
- IV tubing connected to nasal cannula
- Syringe connected to trach cuff
- Epidural solution connected to a peripheral or central IV catheter
- Epidural line connected to an IV infusion
- Bladder irrigation solution utilizing primary IV tubing connected to a peripheral or central IV catheter
- Foley catheter connected to NG tube
- IV infusion connected to an indwelling urinary catheter
- IV infusion connected to an enteral feeding tube
- Primary IV tube connected to a blood product meant for transfusion

  (FDA, 2017)

Patient's feeding tube is incorrectly connected to the instillation port on the ventilator in-line suction catheter, delivering tube feeding into the patient's lungs, causing death. (Source: FDA, 2017.)

PREVENTING TUBING MISCONNECTIONS

Attempts to prevent device misconnections have included color-coding, labels, tags, and training. However, these methods alone have not effectively solved the problem, because they have not been consistently applied, nor do these methods physically prevent the misconnections.

In order to reduce the chances of tubing misconnections, non-Luer lock connections have been introduced. These include the NR-Fit connector for neuraxial and regional anesthesia catheters and the Enfit connectors for feeding tubes.

These connectors are designed to be incompatible with Luer adaptors, which are commonly used in IV applications. The connectors look and secure very similar to a Luer threaded lock system, although the design is larger and, therefore, incompatible with connectors for unrelated delivery systems such as trach tubes, IV lines, and catheters (Rodziewicz et al., 2021).

Until new connectors are universally adopted, the following interventions offer healthcare providers with strategies such as the use of ACT to prevent device misconnections (see table):

"ACT" TO PREVENT DEVICE MISCONNECTIONS		
Label	**Step**	**Actions**
A	Assess equipment	• Assess and clearly label each device, including low-risk devices and high-risk catheters.
C	Communicate	• Ensure communications between healthcare staff during patient transfer. • Inform nonclinical staff, patients, families, and caregivers that they must get help from clinical staff whenever there is a real or perceived need to connect or disconnect devices or tubing.
T	Trace	• Trace a tube from the patient to the point of origin prior to connecting any new devices or replacing an old one. • Vigilantly check and recheck fittings and connectors to ensure proper connections prior to each use.
(FDA, 2018)		

Healthcare-Associated Infections (HAIs)

HAIs are infections that occur while receiving healthcare in a hospital or other healthcare facility and that first appear 48 hours or more after admission or within 30 days after having received healthcare. HAIs are considered system failures and are often preventable (CDC, 2020a).

One of the most important reasons in healthcare settings for the spread of bacteria, some of which are antibiotic-resistant and can prove life threatening, is the failure of physicians, nurses, and other caregivers to practice basic hand hygiene. Studies show that on average healthcare providers clean their hands less than half of the times they should, contributing to the spread of HAIs (CDC, 2020b).

PREVENTING CATHETER-ASSOCIATED URINARY TRACT INFECTIONS

Catheter-associated urinary tract infections (CAUTIs) occur at a rate of approximately 3% to 10% per day of catheterization, making duration of catherization an important risk factor. Complications of CAUTIs include sepsis, bacteremia, and involvement of the upper urinary tract (Fekete, 2020).

The CDC (2019a) recommends the following actions supported by evidence-based research for preventing urinary tract infections:

- Insert catheters only for appropriate indications.
- Leave catheters in place only as long as needed.
- Avoid use of urinary catheters in patients and nursing home residents for management of incontinence.

- Avoid routinely using urinary catheters in operative patients unless necessary.
- Perform hand hygiene immediately before and after insertion or any manipulation of catheter device or site.
- Ensure that only properly trained persons insert and maintain catheters.
- In acute care hospital settings, insert catheters using aseptic technique and sterile equipment.
- In nonacute care settings, use clean technique for intermittent catheterization.
- If ultrasound bladder scanners are used, ensure that equipment is cleaned and disinfected between patients.
- Properly secure indwelling catheters after insertion to prevent movement and urethral traction.
- Unless clinically indicated, use the smallest-bore catheter possible consistent with good drainage.
- Follow aseptic insertion and maintain a closed drainage system.
- If breaks in aseptic technique, disconnection, or leakage occur, replace the catheter and collection system.
- Maintain unobstructed urine flow.
- Keep collecting bag below level of bladder at all times.
- Do not rest collecting bag on the floor.
- Empty collecting bag regularly using separate, clean container for each patient; avoid contact of spigot with the container.
- Obtain urine samples aseptically. If small amount needed, aspirate from needleless sampling port with sterile syringe/cannula adapter after cleaning the port with a disinfectant.
- If obstruction occurs and catheter material is contributing to obstruction, change the catheter.
- Comply with CDC hand hygiene recommendations and Standard Precautions.

Also consider:

- Alternatives to indwelling urinary catheterization in selected patients
- Urinary catheter systems with preconnected, sealed catheter-tubing junctions

- Use of portable ultrasound devices for assessing urine volume to reduce unnecessary catheterizations

PREVENTING SURGICAL SITE INFECTIONS

Surgical site infections (SSIs) occur in 2% to 4% of all patients undergoing inpatient surgical procedures. Although most infections are treatable with antibiotics, SSIs remain a significant cause of morbidity and mortality after surgery. They are the leading cause of readmissions to the hospital following surgery, and approximately 3% of patients who contract an SSI will die as a result (AHRQ, 2019e).

The CDC recommends the following measures for the prevention of surgical site infections:

- Administer preoperative antimicrobial agents in accordance with clinical practice standards and guidelines.
- In clean and clean-contaminated procedures, do not administer additional prophylactic antimicrobial agent doses after the surgical incision in closed in the OR, even in the presence of a drain.
- Do not apply antimicrobial agents to the surgical incision with the aim of preventing SSI.
- Consider the use of triclosan-coated sutures for the prevention of SSI.
- Implement perioperative glycemic control in all patients.
- Maintain perioperative normothermia.
- Advise patients to shower or bathe the entire body with either antimicrobial or nonantimicrobial soap or an antiseptic agent the night prior to surgery.
- Perform intraoperative skin preparation with an alcohol-based antiseptic agent unless contraindicated.
- Consider intraoperative irrigation of deep or subcutaneous tissues with aqueous iodophor solution.
- Do not withhold transfusion of necessary blood products from patients undergoing prosthetic joint arthroplasty as a means of preventing SSI.
  (Singhal, 2019)

PREVENTING CENTRAL LINE–ASSOCIATED BLOODSTREAM INFECTIONS

Central line–associated bloodstream infections (CLABSIs) are laboratory-confirmed bloodstream infections that are not secondary to an infection at another body site, due to the presence of an intravascular catheter that terminates at or close to the heart, or in one of the great vessels that is used for infusion, withdrawal of blood, or hemodynamic monitoring (NHSN, 2021).

AHRQ (2018) guidelines for prevention of CLABSIs include the following:

Catheter Insertion

- Use aseptic technique:
    - Use appropriate hand hygiene using soap and water or a waterless hand sanitizer.
    - Use face mask, cap, and sterile gloves.
    - Wear a sterile gown with neck snaps and wrap-around ties properly secured.
    - Instruct anyone assisting to wear the same barriers.
    - Cover the patient entirely with a large sterile drape.
    - Create a sterile working surface that acts as a barrier between the insertion site and any possible source of contamination.
- Prepare skin with antiseptic/detergent chlorhexidine 2% in 70% isopropyl alcohol.
- Apply a sterile dressing to the insertion site before the sterile barriers are removed.
    - Transparent dressings are preferred to allow visualization of the site.
- Use chlorohexidine for skin preparation.
- Use full barrier precautions during central venous catheter insertion.
- Avoid using the femoral vein for catheter in adult patients.

CV Catheter Site Selection

- Use the subclavian site unless medically contraindicated (anatomic deformity, coagulopathy, renal disease that may require dialysis).
- If the internal jugular vein is chosen, use the right side to reduce risk of noninfectious complications since it has a larger diameter and a straighter path to the superior vena cava.

CV Catheter Selection

- Use a single-lumen central venous access device (CVAD) for patients requiring long-term access (more than 30 days) or a PICC or cuffed CVAD for patient requiring access for greater than 2 weeks.

Arterial Line Site Selection

- Radial artery is the preferred site.
- Dorsalis pedis is the alternative site.
- Femoral sites have higher infection rates, brachial/maxillary site are last resort.

Postinsertion Care

- Evaluate the need for CVAD daily.

- Remove catheter when not needed or change to a single-lumen CVAD when possible.
- Replace the dressing when it becomes damp, loosened, or soiled.
- Replace gauze dressing used on short-term central venous catheter (CVC) sites every 2 days.

PREVENTING PERIPHERAL IV CATHETER–RELATED BLOODSTREAM INFECTIONS

Peripheral vascular catheter (PVC)-associated bloodstream infections occur in approximately 0.18% of patients (Blauw et al., 2019). Guidelines for prevention of peripheral IV catheter-related bloodstream infections include the following:

Site Selection

- In adults, use an upper-extremity site for catheter insertion.
- In pediatric patients, use the upper or lower extremities or the scalp (in neonates or young infants).

Catheter Selection

- Avoid use of steel needles for administration of fluids and medications that might cause tissue necrosis if extravasation occurs.
- Use a midline catheter or peripherally inserted central catheter (PICC), instead of short peripheral catheter, when duration of IV therapy will exceed six days.

Catheter Insertion

- Perform hand hygiene before insertion.
- Prepare clean skin using a chlorhexidine-based solution. If contraindicated, tincture of iodine, an iodophor or 70% alcohol can be used. Allow to dry prior to placing catheter.
- Maintain aseptic technique for insertion of peripheral IV (PIV).
- Wear clean gloves, rather than sterile, for insertion of a peripheral intravenous catheter if the access site is not touched after application of skin antiseptics.
- Use maximal sterile barrier precautions (cap, mask, sterile gown, sterile gloves, and sterile full body drape) for insertion of PICCs.
- Use either sterile gauze or sterile, transparent, semipermeable dressing to cover site.

Catheter and Site Care

- Perform hand hygiene procedures before and after palpating catheter insertion sites as well as before and after, replacing, accessing, repairing, or dressing an intravascular catheter.
- Evaluate catheter insertion site daily both visually and by palpation through the dressing to discern tenderness and by inspection if a transparent dressing is in use. If local

tenderness or other signs of possible infection occur, an opaque dressing should be removed and the site inspected visually.

- Replace catheter site dressing if it becomes damp, loosened, or visibly soiled.
- Do not use topical antibiotic ointment or creams on insertion sites, except for dialysis catheter.
- Remove peripheral venous catheter if patient develops signs of phlebitis, infection, or a malfunctioning catheter.
- Wear either clean or sterile gloves when changing the dressing on catheter sites.
- Replace dressing every 7 days for transparent dressing, except in pediatric patients in which risk for dislodging catheter may outweigh the benefit.
- Do not submerge catheter or catheter site in water; cover during showering.
- In both adult and pediatric patients, leave peripheral venous catheters in place until IV therapy is completed, unless a complication occurs.
- For catheters inserted under emergency conditions, insert a new catheter at a different site within 24 hours.
- Encourage patients to report any changes in their catheter site or any new discomfort to their provider.

Replacement of Administration Sets

- Replace administration sets, including secondary sets and add-on devices, no more frequently than at 96-hour intervals, unless clinically indicated.
- Replace tubing used to administer blood, blood products, or lipid emulsions within 24 hours of initiating the infusion.

(Jacob & Gaynes, 2020; CDC, 2017a)

PREVENTING CLOSTRIDIOIDES DIFFICILE INFECTIONS

Clostridioides (Clostridium) difficile (C. diff) infections (CDIs) cause life-threatening diarrhea. It is usually a side-effect of taking antibiotics. Those most at risk are patients, especially older adults, who take antibiotics and people staying in hospitals and nursing homes for a long period of time (CDC, 2019b).

Strategies for the prevention of *Clostridioides* (formerly known as *Clostridium*) *difficile* infection include the following:

- Isolate and initiate Contact Precautions for suspected or confirmed CDI.
- Maintain Contact Precautions for at least 48 hours after diarrhea has resolved, or longer, up to the duration of hospitalization.
- Adhere to recommended hand hygiene practices.

- Use dedicated patient-care equipment (e.g., blood pressure cuffs, stethoscopes).
- Implement daily patient bathing or showering with soap and water.
- When transferring patients, notify receiving wards or facilities about the patient's CDI status.
- Perform daily cleaning of CDI patient rooms using *C. difficile* sporicidal agent at least once a day, including toilets.
- Clean and disinfect all shared equipment prior to use with another patient (e.g., wheelchair).
- Perform terminal cleaning after CDI patient transfer/discharge using a *C. difficile* sporicidal agent.
- Clean additional areas that are contaminated during transient visits by patients with suspected or confirmed CDI (e.g., radiology, emergency rooms, physical therapy) with *C. difficile* sporicidal agent.
- Restrict use of antibiotics with the highest risk for CDI (e.g., fluroquinolones).
- Ensure that patients receive the shortest effective duration of antibiotic therapy.
- Limit use of nonantibiotic patient medications (e.g., proton pump inhibitors, H2-receptor blockers) that are hypothesized to increase risk for CDI.
- Consider additional disinfection of CDI patient room with no-touch technologies (e.g., UV light).
- Dedicate healthcare personnel to care only for patients with CDI only to minimize risk of transmission to others.
  (CDC, 2017b)

PREVENTING MULTIDRUG-RESISTANT ORGANISM (MDRO) INFECTIONS

The CDC recommends the use of Contact Precautions in inpatient acute care settings for patients known to be colonized or infected with epidemiologically important MDROs, including methicillin-resistant *Staphylococcus aureus* (MRSA). However, there is debate as to the most beneficial way to manage patients with MDRO infections.

Based on current evidence, the CDC continues to recommend the use of Contact Precautions for MRSA-colonized or infected patients. The CDC will continue to evaluate the evidence on Contact Precautions as it becomes available.

In acute care hospitals, CDC recommendations state:

- Promote the judicious use of antimicrobial agents.
- Follow Standard Precautions during all patient encounters in all healthcare settings.
- Use a mask according to Standard Precautions when:
    - Performing a splash-generating procedure
    - Caring for patients with open tracheostomies
    - In circumstances where there is evidence of transmission from heavily colonized sources, such as burn wounds
    - Not recommended during routine care
- Implement Contact Precautions for all patients known to be colonized/infected with target MDROs.

In long-term care facilities:

- Consider the individual patient's clinical situation and prevalence or incidence of MDROs in the facility when deciding whether to implement or modify Contact Precautions in addition to Standard Precautions for a patient infected or colonized with a target MDRO.

In ambulatory and home care settings:

- Follow Standard Precautions.
- Limit the amount of reusable patient care equipment that is brought into the home of patients infected or colonized with MDROs.

(CDC, 2020c)

PREVENTING HOSPITAL-ACQUIRED PNEUMONIA LUNG INFECTIONS

Hospital-acquired pneumonia (HAP) occurs 48 hours or more after hospital admission at a rate of 5 to 10 per 1,000 hospital admissions. Ventilator-associated pneumonia (VAP) is a subset of HAP occurring in intensive care units that presents more than 48 to 72 hours after tracheal intubation (Shebl & Gulick, 2020).

Strategies for the prevention of ventilator-associated pneumonias include:

- Use of routine infection control practices and hand hygiene
- Prophylactic antibiotic administration
- Sedation interruption
- Keeping head of bed elevated 30 to 45 degrees

- Limitation of ventilation times
- Endotracheal suctioning
- Avoiding gastric overdistention
- Draining ventilator tube condensate
- Kinetic bed therapy
- Changing ventilator circuit if visibly soiled or mechanically malfunctioning
- Using sterile suctioning techniques and handling of respiratory equipment
- Performing oral care at least every 2 to 4 hours with an antiseptic swab and brushing the teeth twice a day
  (Shebl & Gulick, 2020)

Falls

Falls are the most common type of accidents in people 65 years of age and older. Falls in institutional settings occur more frequently and are associated with greater morbidity than falls that occur in the community. Approximately 50% of individuals in the long-term care setting fall yearly (Appeadu & Bordoni, 2020; Kiel, 2020).

Falls risk can be categorized as either intrinsic or extrinsic. **Intrinsic factors** include issues that are unique to the individual and concern medical, psychological, and physical issues such as advanced age, inner ear disorders, and lower extremity weakness (Appeadu & Bordoni, 2020). **Extrinsic factors** generally can be changed and address environmental risks that patients encounter, such as use of restraints, dim lighting or glare, ill-fitting or inappropriate footwear (AHRQ, 2017).

Older patients are not the only population at risk. Any patient who has had excessive blood loss may experience postural hypotension, increasing the risk of falling. Maternity patients or other patients who have epidural anesthesia are at risk for falls due to decreased lower-body sensation (AHRQ, 2017b).

PREVENTING FALLS

Preventing falls involves assessing patients for risk for falls, developing a personalized plan of care, and utilizing consistent preventive interventions.

Hospitalized Patients

A fall risk assessment should be done on admission, and reassessment should be done whenever there is a change in a patient's condition or when a patient is being transferred to another unit. While some institutions have created their own **assessment tools**, tools that have been extensively studied and recommended include:

- Morse Fall Scale
- STRATIFY Scale
- Schmid Fall Risk Assessment Tool

Some examples of tailored **prevention interventions** include:

- Physical therapy evaluation/treatment for gait instability
- Toileting schedule for incontinence
- Continuous virtual monitoring for agitation, confusion, or impaired judgment
- Pharmacy consults for medication side effects
  (Dykes et al., 2018)

Community-Dwelling Patients

The Centers for Disease Control and Prevention's **STEADI** (Stop Elderly Accidents, Deaths and Injuries) initiative is a coordinated approach for the implementation of practice guidelines for fall prevention in community-dwelling adults. It consists of these three core elements:

- Screen for fall risk annually or any time the patient presents with an acute fall
- Assess those who are found to be at risk
- Intervene to reduce identified risk factors
  (CDC, 2020d)

ERROR RISKS AMONG POPULATIONS OF SPECIAL VULNERABILITY

The safety of all patients is of paramount concern for all healthcare providers. However, some patients—for example, the very young, the very old, and the very sick—are particularly vulnerable to the effects of medical errors, often due to their inability to participate actively as a member of the healthcare team due to communication issues. In addition, their physical status (including but not limited to body weight and body mass composition, nutritional status, and metabolism) may also cause them to react differently to interventions, putting them at special risk. Healthcare providers must recognize the special needs of these patients and act accordingly.

Older Adults

There are multiple issues of concern when providing healthcare to adults ages 65 and over. Failure to recognize the unique problems of this age group can result in adverse events.

POLYPHARMACY

Older adults often are taking multiple medications (polypharmacy), creating a significant risk for adverse drug events. Medication management in the older adult population involves considerations for drug dosing, drug interactions, adverse effects, adherence, social issues, clinical practice guidelines, and altered physiology (Nguyen et al., 2020).

COGNITIVE IMPAIRMENT

Confusion and/or delirium in the older adult, especially someone with preexisting cognitive impairment, can be due to certain aspects of hospitalization, such as changes in environment and sensory deprivation. Delirium can also be the result of polypharmacy. Effective measures include orientation protocols, environmental modification, nonpharmacologic sleep aids, early and frequent mobilization, minimizing use of physical restraints, use of vision and hearing aids, adequate pain relief, and reduction in polypharmacy (Mattison, 2020).

FUNCTIONAL DECLINE

When an older adult is hospitalized, functional decline can occur as early as the second day of hospitalization. Immobility can increase the risk for adverse events such as falls, delirium, skin breakdown, and venous thromboembolic disease. Improved mobility during hospitalization has been linked to decreased risk of death. Activity order for bed rest should be avoided unless absolutely medically required. Patients should be assisted out of bed to a chair for meals, which can also decrease the risk of aspiration, and should be encouraged to walk several times a day (Mattison, 2020).

FALL RISK

Risk for falls is increased in the older adult and may be due to the effects of acute illness compounded by an unfamiliar environment and side effects of treatments. Tethering medical devices such as urinary catheters, IV lines, cardiac monitor leads, and restraints make it more difficult to mobilize patients safely and are associated with increased rates of delirium, infection, and falls.

Strategies to help prevent falls may include weighing the risks and benefits of medications with significant psychotropic and anticholinergic effects, monitoring patients when prescribed drugs that may increase fall risk, supervising high-risk patients when ambulating, and encouraging time out of bed walking or sitting in a chair to prevent orthostatic hypotension associated with prolonged immobility (Mattison, 2020).

(See also “Falls” earlier in this course.)

MALNUTRITION/DEHYDRATION

Malnutrition and dehydration in hospitalized and nursing home older patients may result due to impairment in cognition, restriction of movement, no access to dentures, difficulty with

self-feeding, missed or interrupted meals, reduced appetite due to illness or lack of activity, lack of assistance with meals and drinks, and severely restricted diet orders, such as nothing by mouth.

Simple interventions such as getting the person out of bed at mealtime and providing assistance with eating can be of benefit. Inpatient assessment by a nutritionist can identify deficiencies and, combined with nutritional follow-up after discharge, may decrease mortality (Mattison, 2020).

Infants and Children

The potential for adverse drug events is higher in the hospitalized pediatric population than in hospitalized adult patients due to pharmacokinetic parameters and the need for precise dosage measurement. For this reason, accurate weight scales, standardized equipment throughout a system, drug dose range limits, programmable "smart" infusion pumps for hospitals, and standardized order sets should be used.

Pharmacists can be consulted to check dosing calculation, screen for drug-drug interactions, and educate caregivers regarding proper administration and medication storage safety.

Infants and young children do not have the communication abilities needed to alert clinicians to effects they experience. Parents of infants and children need to be fully informed and involved in their child's care during any encounter with the healthcare system and must be educated to question caregivers about medications and procedures (Wu, 2018; Mueller et al., 2019).

Intensive Care Patients

Intensive care settings are one of the most complex environments in healthcare. Medical errors and deaths due to preventable harms are more common in the ICU due to higher patient acuity and complexity of care. A **safety smart list** integrated into intensive care patients' electronic health records has been found to decrease complications and length of stay in the ICU. The checklist covers common ICU conditions that, when left unaddressed, have been associated with HAIs, thrombosis, and worse clinical outcomes (Lemkin et al., 2020).

Patients with Limited English Proficiency (LEP)

Individuals with LEP have problems with language competence that negatively affect communication and can greatly define the ease with which they navigate all areas of the healthcare system. They are at higher risk for complications because of poor comprehension of medication errors, inaccurate assessment, increased psychological stress, and poor compliance with treatment and follow-up. In addition, the use of family or friends as interpreters increases chances of error (Claros, 2021).

Both the Joint Commission and the Affordable Care Act mandate adequate medical interpreter and translation services for patients who have LEP. Translation and interpreter services provided by Certified Medical Interpreters is the gold standard (Goodwin, 2018).

Patients with Low Health Literacy

Health literacy is defined as the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions. Low health literacy may have a negative effect on a person's adherence to a treatment regimen and may impact parent/caregiver behavior and children's health outcomes (ODPHP, 2020).

Since limited health literacy is common and may be difficult to recognize, it is recommended that clinicians assume all patients and caregivers may have difficulty comprehending health information and that they communicate in ways that anyone can understand. Improving health literacy includes:

- Simplifying oral and written communications
- Confirming comprehension for all patients and caregivers
- Making the healthcare system easier to navigate
- Supporting patients' efforts to improve their health
  (ODPHP, 2020)

INSTITUTIONAL STRATEGIES FOR ADDRESSING ERRORS

Essential strategies healthcare facilities must consider in their efforts to reduce medical errors include:

- Changes in organizational culture
- Involvement of leadership
- Education of providers
- Development of patient safety committees
- Adoption of safe protocols and procedures
- Use of technology
  (AHRQ, 2019f)

Creating a Culture of Safety

A culture of safety encompasses the following key features:

- Acknowledging the high-risk nature of an organization's activities and the determination to achieve consistently safe operations

- Fostering a blame-free environment where individuals are able to report errors or near misses without fear of reprimand or punishment
- Encouraging collaboration across ranks and disciplines to seek solutions to patient safety problems
- Committing organizational resources to address safety concerns (AHRQ, 2019f)

JUST CULTURE MODEL

A *just culture* is defined as organizational accountability for the systems they have designed and employee accountability for the choices they make. In such a setting, trust is critical to shared accountability. Trust in leaders is defined as the perception that healthcare employees will receive fair treatment from leaders following an adverse event, regardless of their position in the hospital or the event's severity. In such a highly reliable organization, employees routinely identify and report unsafe conditions and errors because they trust leaders want to know what is not working and will implement visible and meaningful improvements with this information.

All types of errors hold equal importance in a just culture, not just those with poor outcomes. To build trust, error identification and reporting are encouraged to provide opportunities for staff education and system redesign.

Two important features of a just culture include 1) a nonblaming incident investigation and 2) understanding the behavioral choices that a person makes (Paradiso & Sweeney, 2019).

Leadership

Hospital boards now use strategic initiatives to influence quality and safety, however, data shows that executives and management can further improve safety by having more direct interactions with frontline workers. Visits by management (walkarounds) to clinical areas to engage in open and frank discussions with the staff about safety concerns have been shown to have a positive impact on safety culture. To be credible among frontline staff during these walkarounds, however, it is important that issues raised by the staff be addressed promptly and that leaders follow up sufficiently after an error has been reported.

Leadership can also directly address safety concerns by recognizing and managing disruptive and unprofessional behavior by clinicians. As boards have oversight over the medical staff, they have the ability to ensure unprofessional or incompetent clinicians do not put patients at risk (AHRQ, 2019g).

FLORIDA STATUTORY REQUIREMENTS

Florida's Comprehensive Medical Malpractice Reform Act of 1985 mandates that each licensed facility implement a risk-management program and that healthcare professionals are obligated to

report adverse events to the facility leadership. State oversight is provided by the Florida Agency for Health Care Administration (AHCA). Each licensed facility is required to hire an F.S. 395-10974 licensed risk manager who is responsible for implementation and oversight of the risk management program.

Internal Risk Management Program Requirement

Florida Statutes (F.S., 2019) require every facility licensed under F.S. 395-1097 to establish an internal risk management program that must include the following:

- The investigation and analysis of the frequency and causes of adverse incidents
- The development of appropriate measures to minimize risk, including:
    - Education and training of all non-physician personnel as part of initial orientation and at least one hour of such education and training annually for all personnel working in clinical areas and providing patient care, except for licensed healthcare practitioners who are required to complete continuing education coursework pursuant to chapter 456 or their respective practice act
- The analysis of patient grievances related to patient care
- A system for informing a patient or designee pursuant to state law that the patient was the subject of an adverse event
- Prohibition against a single staff person attending patients in recovery room unless there is live observation, electronic observation, or any other reasonable measure to ensure patient protection and privacy
- Prohibition against any unlicensed person from assisting or participating in any surgical procedure unless authorized to do so
- An incident reporting system to report adverse incidents to the risk manager or designee within three business days after their occurrence

Adverse Incident Requirements

F.S. 395-0197 mandates internal reporting within three business days of any adverse incident (event) over which healthcare personnel could exercise control and that is associated in whole or in part with medical intervention rather than the condition for which such intervention occurred. These include:

1. Adverse events resulting in one of the following injuries:
    - Death
    - Brain or spinal damage
    - Permanent disfigurement

- Fracture or dislocation of bones or joints
- Limitation of neurologic, physical, or sensory function which continues after discharge from the facility
- Any condition that required specialized medical attention or surgical intervention resulting from nonemergency medical intervention, other than an emergency medical condition, to which the patient has not given his or her informed consent
- Any condition that required the transfer of the patient, within or outside the facility, to a unit providing a more acute level of care due to the adverse incident rather than the patient's condition prior to the adverse incident

2. The performance of a surgical procedure on the wrong patient, a wrong surgical procedure, a wrong-site surgical procedure, or a surgical procedure otherwise unrelated to the patient's diagnosis or medical condition

3. Surgical repair of damage resulting to a patient from a planned surgical procedure, where the damage was not a recognized specific risk, as disclosed to the patient and documented through the informed-consent process

4. A procedure required to remove unplanned foreign objects remaining from a surgical procedure

Licensed facilities in Florida are required to submit two types of reports to AHCA:

An **adverse incident report** must be submitted to the AHCA by mail or by using the online Adverse Incident Reporting System (AIRS) within 15 calendar days after its occurrence, whether occurring in the licensed facility or arising from healthcare prior to admission to the licensed facility.

The annual report summarizes the incident reports that have been filed in the facility for that year and includes:

- The total number of adverse incidents
- Types of adverse events listed by category and number of incidents occurring within each category
- Code numbers of each professional and individual directly involved and number of incidents each has been directly involved in
- Description of all malpractice claims filed against the facility, including number of pending and closed claims, the status and disposition of each claim

CONCLUSION

Everyone has a stake in the safety of the healthcare system—healthcare workers as well as the general public. All healthcare workers are being actively educated about their roles in the prevention of avoidable negative outcomes for all patients. It is essential that all clinicians understand the journey every patient makes through the system, recognizing how the system can fail, and take action to prevent those failures.

To counter errors and safeguard patients, changes must continue to be made in how the workforce is deployed; in how work processes are designed; and in the leadership, management, and the culture of healthcare organizations. Because communication issues are so commonly involved in medical errors, it is crucial that physicians, nurses, therapists, and other healthcare personnel work together as a team, respecting each other's contributions to the well-being of the patients in their care. Collaborative teamwork is essential for optimizing quality and safety in healthcare.

RESOURCES

AGS Beers Criteria (American Geriatrics Society)
https://www.elderconsult.com/wp-content/uploads/PrintableBeersPocketCard.pdf

Florida Agency for Health Care Administration, Division of Health Quality Assurance
http://ahca.myflorida.com/MCHQ/index.shtml#1

Institute for Healthcare Improvement
http://www.ihi.org

List of high-alert medications (Institute for Safe Medication Practices)
http://www.ismp.org/Tools/highalertmedications.pdf

Patient Safety Network
http://psnet.ahrq.gov

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TEST

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1. A medical error is best defined as:

a. A problem with a procedure or a system.
b. An unplanned action due to negligence.
c. Failure of a planned action to be completed as intended.
d. An unplanned event that can always be prevented.

2. According to the Joint Commission, a patient safety event that results in death, permanent or severe temporary harm, and intervention required to sustain life is referred to as a(an):

a. Sentinel event.
b. Medical error.
c. Near miss.
d. Adverse event.

3. The most common cause of medical errors is:

a. Inadequate staff or supervision.
b. Technical failure or equipment.
c. Ineffective communication.
d. Deficiency in education and training.

4. Which is a **correct** statement about surgical safety checklists?

a. Checklists increase teamwork and communication in surgery.
b. Checklists have no impact on postoperative complications.
c. Checklists do not require extensive staff interaction.
d. Checklists are not effective in detecting potential safety hazards.

5. Most medication errors occur when drugs are being:

a. Prescribed and transcribed.
b. Compounded and packaged.
c. Dispensed and administered.
d. Monitored and discontinued.

6. Recommendations to reduce the incidence of line and tubing misconnections include:

a. Requiring that all Luer locks be discontinued.
b. Using tubing designed to be incompatible with Luer locks.
c. Eliminating tubing that contains phthalates.
d. Using catheters that have injection ports.

7. Which is an example of an **intrinsic** risk factor for falls?

a. Lack of stair handrails
b. Inner ear disorder
c. Improper footwear
d. Dim lighting

8. The most common medical error among hospitalized infants and young children is:

a. Dose calculation errors.
b. Failure to screen for drug-drug interactions.
c. Inappropriate delivery systems.
d. Lack of available dosage forms.

9. A "just culture" model approach within healthcare includes:

a. Blaming the individual.
b. Organizational accountability.
c. Employee unaccountability.
d. Distrust in leaders.

10. Florida statutes require adverse incident reports to be submitted within what time period after occurrence?

a. 48 hours
b. 3 days
c. 7 business days
d. 15 calendar days