Prevention of Medical Errors for Florida Healthcare Professionals

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LEARNING OUTCOME AND OBJECTIVES: Upon completion of this course, Florida nurses and other healthcare professionals will understand current, evidence-based interventions to prevent medical errors in the practice setting. Specific learning objectives include:

- Discuss the scope of medical errors in the U.S. healthcare environment.

- Define the terminology associated with medical errors.

- Describe the causes of medical errors.

- Review the most common medical errors and means to prevent them.

- Summarize provider and institutional strategies for preventing medical errors.

- Discuss Florida's statutory requirements for addressing medical errors.

INTRODUCTION

It would seem 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, nearly a quarter of adults report having personally experienced a medical error. Errors occur in hospitals, clinics, surgery centers, doctors' offices, nursing homes, pharmacies, and even in patients' homes.

These facts make medical errors 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 develop healthcare-associated infections, 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 ulcer/injury, are misdiagnosed, when orders are misinterpreted, or when equipment fails.

Those in leadership roles claim that the main reason for preventable medical mistakes is a healthcare system that is inadequate for the complexities of 21st-century medicine. It is acknowledged that the U.S. healthcare system is resistant to change because it is a fragmented, nonuniform system that lacks any centralized control and that many healthcare systems do not adequately invest in patient safety by putting well-known safety improvement strategies in place (Kavanagh et al., 2017).

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 improve. In other words, healthcare organizations need to 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.

SCOPE OF THE MEDICAL ERROR PROBLEM

Current studies estimate that medical errors are the third leading cause of death in the United States, trailing heart disease and cancer. In 2016, the Leapfrog Group estimated there were 206,201 avoidable deaths in hospitals, and a Johns Hopkins University team estimated deaths at greater than 250,000. Such numbers are hard to verify, however, as there are no well-established means for calculating mortality caused by medical harm, and death certificates lack a place to indicate whether a medical mistake caused or contributed to a patient's death (Kavanagh et al., 2017).

The U.S. Department of Health and Human Services' Agency for Health Research and Quality (AHRQ, 2016a) estimates the incidence of medical errors that occur each year in U.S. hospitals. AHRQ reports that 2015 data indicated a 21% decline in hospital-acquired conditions (HACs) compared to data from 2010. AHRQ estimates that nearly 125,000 fewer patients died in the hospital as a result of HACs, and that approximately $28 billion in healthcare costs were saved from 2010 to 2015.

The exact cause of the decline in patient harm is not fully understood; however, increased attention to safety to reduce adverse events by hospitals throughout the country has occurred. Likely reasons for this progress may be Medicare and Medicaid payment incentives, the U.S. Department of Health and Human Services Partnership for Patient Initiative, public reporting of hospital-level results, and technical assistance offered to hospitals by the Quality Improvement Organization program (AHRQ, 2016a).

The great majority of healthcare takes place in the outpatient setting, and over the past few years, efforts have been focused on improving patient safety in this area. The Joint Commission has developed National Patient Safety Goals to improve patient safety and has issued Ambulatory Health Care National Patient Safety Goals effective January of 2017 to provide further guidance in the enhancement of safety in all ambulatory facilities (AHRQ, 2017a).

Despite the decline, however, one medical error continues to be one too many. A national survey released in September 2017 found that patients who are the recipient of a medical error often experience lasting impact on their physical and emotional health, financial well-being, or family relationships (IHI, 2017).

TERMINOLOGY ASSOCIATED WITH MEDICAL ERRORS

Adverse Events

Medical error, also referred to as *adverse event,* is a broad term ascribed to an act of commission (doing something wrong) or omission (failing to do something right) in medical management that leads to an undesirable outcome or serious potential for such an outcome that is unrelated to the patient's underlying condition. Such adverse events are unintended and may require additional monitoring, treatment, hospitalization, or result in disability or death.

Important subcategories of adverse events include:

- **Unpreventable** adverse events result from a complication that cannot be prevented.

- **Preventable** adverse events occur due to error or failure to apply an accepted standard for prevention.

- **Ameliorable** adverse events are those that could have been less harmful if different actions or procedures had been performed or followed.

- **Negligence** is the result of care that falls below the standards expected of clinicians in the community.
  (AHRQ, 2017b)

Near Misses

Near misses are events that could have had an adverse consequence but did not. In a near miss, an error was committed but the patient did not experience clinical harm because of early detection or sheer luck. They are indistinguishable from adverse events in all but outcome.

Sentinel Events

The Joint Commission defines *sentinel event* as a patient safety event, incident, or condition that could have resulted or did result in any of the following:

- Death

- Permanent harm

- Severe temporary harm and intervention required to sustain life

Sentinel events are so named because they signal the need for immediate investigation and response. Sentinel events and medical errors are not identical. Not all sentinel events occur because of an error, and not all medical errors result in sentinel events (TJC, 2017a).

Never Events

The National Quality Forum (NQF, 2017) has developed and endorsed a list of 29 events that are termed *serious reportable events* (SREs) and considered to be extremely rare medical errors. These errors are also referred to as *never events*—events that should never happen—and are grouped into seven categories, as follows:

- Surgical SREs (e.g., surgery performed on wrong body parts or the wrong 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 suicide while in a healthcare setting)

- Care management SREs (e.g., patient death/serious injury associated with a fall while in a healthcare setting)

- Environmental SREs (e.g., patient death/serious injury associated with the use of restraints while in a healthcare setting)

- 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, 2017)

Active and Latent Errors

Current knowledge about why humans make errors identifies two types of errors: active and latent.

- **Active errors** (human errors) involve individuals who are actually doing a task, and the effects are felt almost immediately (e.g., a surgeon amputates the wrong foot).

- **Latent errors** are errors in system or process design, faulty installation or maintenance of equipment, or ineffective organizational structure. They are accidents waiting to happen.
  (AHRQ, 2017c)

WHY DO MEDICAL ERRORS HAPPEN?

In the past, medicine has viewed errors as failures on the part of individual healthcare providers that are the result of inadequate knowledge or skill. The current understanding is that most errors occur due to predictable human failures in the context of poorly designed systems, and according to the AHRQ (2003), there are eight common causes of medical errors.

1. **Communication breakdowns** are the **most common causes** of medical errors. Poor communication of patient information is the most frequent cause of sentinel events.

2. Errors can occur during the **human information processing** involved in the performance of tasks. Such errors may occur in three levels of performance:

    a. **Knowledge-based:** Errors that occur in novel situations due to deficits in knowledge

    b. **Rule-based:** Errors that occur in familiar situations due to incorrect application of a rule or an inadequate plan

    c. **Skill-based:** Errors that occur in experienced situations due to an attention slip or lapse of memory

3. **Patient-related** errors may arise from inappropriate patient identification, incomplete assessment of the patient, failure to obtain consent, inadequate education of the patient, or patient characteristics that are beyond the control of staff.

4. **Organizational transfer of knowledge** errors can occur during the transfer of organizational, situational, or domain-specific knowledge and skills from one entity to another within or between organizations.

5. **Staffing and workflow factors** contribute to errors, such as unmanageable patient workloads, worker fatigue, high provider-to-patient ratios, and interruptions while providing care.

6. **Technical** issues involve failures of medical devices, equipment, implants, or grafts due to poor design, defects in material, or incorrect construction or set-up of equipment.

7. **Information flow** errors occur when there is inadequate flow of information vital to a patient's care on transfer to another facility or discharge from one area to another.

8. Poorly documented, nonexistent, or clinically inadequate **policies and procedures** may lead to errors while providing care.

COMMON MEDICAL ERRORS AND HOW TO PREVENT THEM

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 (AHRQ, 2017d). The number of cases in which a foreign body is left behind during a procedure is estimated at 1,500 per year. Sponges are the most common foreign body retained. Surgical instruments also can be left behind, especially in the abdominal cavity (Zejnullahu et al., 2017).

Other surgical errors may involve peripheral nerve injury and anesthesia-related harm. Specialties with the highest risk of errors are neurosurgery, thoracic, and cardiovascular surgery followed by general surgery (Welch, 2017; Novak, 2016). In recent decades it has been found that improvements in operating room technology and education have led to fewer adverse events.

The World Health Organization Surgical Safety Checklist was developed by an international team of researchers to decrease errors and adverse events and to increase teamwork and communication in surgery. Since its inception, it has shown significant reductions in both morbidity and mortality and is now used by a majority of surgical providers around the world to increase patient safety and reduce intraoperative complications (WHO, 2017a).

While originally intended for use in surgical procedures in both inpatient and outpatient operating rooms, the value of "time outs" and surgical safety checklists is now recognized by many as having more extensive applications. With appropriate modifications to fit specific clinical situations, they have been used to ensure patient safety in radiology, nonsurgical cardiac procedure rooms, endoscopy centers, and other healthcare settings where procedures are performed.

ELEMENTS OF THE 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 before induction of anesthesia (with at least a circulating nurse and anesthesia provider)

1. Has the patient confirmed his/her identify, site, procedure, and consent?

2. Is the site marked?

3. Is the history and physical present?

4. Is the anesthesia machine and medication check complete?

5. Are diagnostic and radiologic test results present?

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6. Are blood products available?

7. Is the pulse oximeter on the patient and functioning?

8. Are all special equipment, devices, and implants present?

9. Does the patient have a:

   - Known allergy?

   - Difficult airway or aspiration risk?

   - Risk of >500 ml blood loss (7ml/kg in children)?

"TIME OUT" checklist must be completed before skin incision (with circulating nurse, anesthetist, and surgeon)

1. Have all team members introduced themselves by name and role?

2. Has the patient's name, procedure, and where the incision will be made been confirmed?

3. Has antibiotic prophylaxis been given within the last 60 minutes?

4. For the anticipated critical event:

   - Surgeon

     o What are the critical or nonroutine steps?

     o How long will the case take?

     o What is the anticipated blood loss?

   - Anesthetist

     o Are there any patient-specific concerns?

   - Nursing team

     o Has sterility (including indicator results) been confirmed?

     o Are there equipment issues or any concerns?

5. Is essential imaging displayed?

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

1. Have the scrub and circulating personnel verbally confirmed:

   - 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. Have the surgeon, anesthetist, and nursing personnel discussed:

- What are the key concerns for recovery and management of this patient?

Source: WHO, 2017a.

Medication Errors

Medication errors cause at least one death every day and injure approximately 1.3 million people annually in the United States (WHO, 2017b).

The National Coordinating Council for Medication Error Reporting and Prevention (2018) defines a medication error as:

> Any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer. Such events may be related to professional practice, healthcare products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.

PRESCRIBING AND TRANSCRIBING

The U.S. Food and Drug Administration (FDA, 2017a) reports that the majority of errors occur when prescribing or transcribing a prescription onto the medication record (see image below).
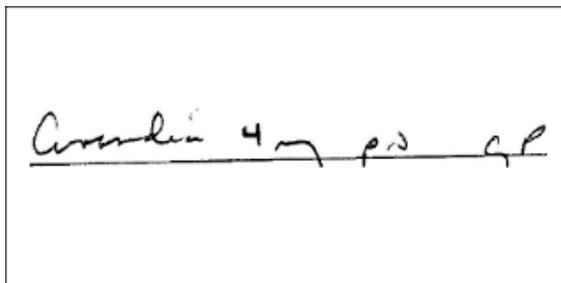
Illegible prescription: Avandia (a diabetic medication) confused
with Coumadin (an anticoagulant), both available as 4 mg oral tablets.
(Source: PNNet, 2003.)

When prescribing**,** strategies recommended to prevent adverse drug reactions include:

- Review the patient's medication list at each encounter and considering the dosages, directions, drug interactions, and side effects.

- Consider making notations on the prescription to indicate the reason for the medication.

- Be vigilant about high-risk drugs and avoid prescribing them whenever possible.

- Replace high-risk drugs with drugs that are less likely to cause adverse events.

- Discontinue unnecessary medications.

- Consider drugs as a cause of any new symptom.

- Avoid treating side effects with another drug.

- Educate patients on indications for each medication, possible side effects, and alternative options.

- Use computerized prescriber order entry (CPOE) to improve the medication ordering process. CPOE improves safety by:

    o Providing a means for standardization of practice

    o Improving completeness and legibility of orders

    o Being alerted to drug allergies, drug-drug interactions, and cumulative dose limits

    o Updating clinicians with current medication information

    o Providing dosage adjustment calculations based on patient characteristics

    o Offering timely communication of critical changes in a patient's condition
(Zhu & Weingart, 2017)

Strategies to prevent medical errors when transcribing include:

- Carefully check handwritten medication orders, clarify they are legible, and ensure they are interpreted correctly.

- Double check all math calculations before entering the dosage into the nursing documentation form.

- Utilize computerized medication records to eliminate the problem of misinterpretation.
(Zhu & Weingart, 2017)

DISPENSING

Dispensing errors can occur at any point from when the prescription arrives in the pharmacy through the supplying of the dispensed medication to the patient or the healthcare worker who will administer it.

Strategies to prevent medical errors when dispensing include:

- Check that the prescription entry is correct. Errors in transcription account for many errors in dispensing.

- Clarify any ambiguous information. Prescriptions that are illegible or ones that use nonstandard abbreviations and other symbols need verification.

- Check prescriptions thoroughly and consider verification by another person.

- Provide patient counseling.

- Check for drug-to-drug interactions and allergies.

- Supervise dispensing medications by pharmacist assistants.

- Open containers and show them to the patient. Patients can raise an alert if the medication looks different from what they usually take.

- Use different lettering and other strategies in order to reduce confusion between medications that look alike or sound alike. ("Tall man" lettering is the practice of writing part of a drug's name in uppercase, e.g. chlorproMAZINE and chlorproPAMIDE.) (Woods, 2017)

ADMINISTRATION

Medication administration errors are very common in both inpatient and outpatient settings. Ten percent of errors cause harm to patients, and 11% require increased monitoring (Volpe et al., 2016).

Safe medication administration requires the nurse to have sound knowledge about a drug, including:

- Mode of action

- Side effects

- Toxicity

- Appropriate dosage

- Rate and route of excretion

- Interaction with other drugs

Nurses should perform a three-way check prior to administering a medication, which includes the physician order compared with medication administration record compared with the pharmacy label. Each should be checked three times to ensure agreement.

Serious administration errors can be avoided by following these rules:

- Avoid interruptions and distractions.

- Prepare medications for one patient at a time.

- Administer the medication to the patient as soon as it has been prepared.

- Never leave medications at the bedside.

- Utilize barcode medication administration to guarantee accuracy.

In the past, nurses were instructed to follow the "5 rights" of medication administration. Currently, the list has expanded to include "10 rights" (see box below).

"10 RIGHTS" OF MEDICATION ADMINISTRATION

1. **Right Patient**

   - Check the patient's identification bracelet.

   - Ask the patient to state his or her name and date of birth.

   - Compare the medication order to the identification bracelet and the patients' stated name and date of birth.

   - Verify patient's allergies with the chart and with the patient.

2. **Right Medication**

   - Perform a triple check of the medication's label:

     o When retrieving the medication

     o When preparing the medication

     o Before administering the medication to the patient

   - Always check the medication label with the prescriber's order.

   - Never administer a medication prepared by another person.

   - Never administer a medication that is not labeled.

3. **Right Dose**

   - Check the label for the concentration of the medication.

   - Compare the dispensed dose with the medication order.

   - Perform all medication calculations three times.

   - Check all medication calculations with another nurse.

- Verify that the dosage is within the appropriate range for the medication and the patient.

4. **Right Time**

- Verify the schedule of medication with the order for:

  o Date to be administered

  o Time to be administered

  o Specific length of time to be administered

- Check when the last dose of the medication was given.

- Administer the medication within 30 minutes of the scheduled time (30 minutes before or 30 minutes after). This does not refer to PRN medications that must be given within an exact time limit, e.g. every 4 hours.

5. **Right Route**

- Verify the medication route with the medication order.

- Confirm that the patient can take or receive the medication by the ordered route.

6. **Right Assessment**

- Prior to medication being administered:

  o Assess patient and laboratory tests to determine if medication is safe and appropriate.

  o Confirm the rationale for the ordered medication.

7. **Right Evaluation**

- After the medication has been administered:

  o Assess the patient for any adverse side effects.

  o Assess the patient for effectiveness of the medication.

- Compare the patient's prior clinical status with postmedication status.

- Document the patient's response to the medication.

8. **Right Education**

- Inform the patient of the medication being administered.

- Inform the patient of the desired effects of a medication.

- Inform the patient of the side effects that may be expected from the medication.

9. **Right to Refuse**

- Know that the patient or legally responsible person has the right to refuse any medication.

- Inform the responsible person of the consequences of refusing the medication.

- Verify that the responsible person understands the consequences.

- Notify the ordering clinician of the refusal and document that notification.

10. **Right Documentation**

- Document:

  o Time given

  o Route

  o Site of injection, if applicable

  o Laboratory value or vital signs needed prior to administration, if indicated

- Document the refusal of a medication and that the responsible party understands the consequences.

- Never document before a medication has been administered.

- Document the patient's response to the medication.

Source: Nwagwu, 2016.

Tubing Misconnections

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. New standards have been set for manufacturing connectors that make it physically impossible for misconnections to occur. As these become more available, the likelihood of risk for misconnection errors is expected to decrease (FDA, 2017a).

EXAMPLES OF TUBING MISCONNECTIONS

- Enteral feeding tube connected to an IV

- Enteral feeding tube connected to ventilator-inline suction catheter

- Blood pressure cuff connected to an IV

- 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 a nasogastric tube

- Primary IV tube connected to a blood product meant for transfusion

WARNING: Photographs depict enteral feeding tube erroneously connected to ventilator in-line suction catheter. DO NOT DO THIS!

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, 2017b.)

Because tubing misconnections continue to cause patient injury and death, new International Organization for Standardization (ISO) tubing connector standards went into development in 2014. These new standards for manufacturing connectors are meant to make it physically impossible for misconnections to occur (FDA, 2017b). However, the shift to new connectors is inconsistent, with just a few countries now introducing mandates or campaigns to encourage use of new connectors. California is the only state requiring facilities to switch to new enteral feeding and epidural connectors in 2016 and 2017 (MD+DI, 2016; California Legislature, 2015).

In those instances where the old connectors remain in use, the Joint Commission and the ECRI Institute (formerly the Emergency Care Research Institute) recommend the following safety measures for nurses and other healthcare providers:

- Clearly label each device, especially certain high-risk catheters such as epidural, intrathecal, and arterial.

- Do not use catheters that have injection ports.

- Trace all lines back to their origin before connecting any new devices or replacing old ones.

- Check and recheck Luers to ensure proper connections prior to each use.

- Develop a policy of positioning different lines on different sides of the patient, or route tubes and catheters with different purposes in unique and standardized directions (e.g., IV lines routed toward the head, enteric lines toward the feet).

- Ensure good communication between healthcare staff during patient transfers.

- Recheck connections and trace all patient tubes and catheters to their sources upon the patient's arrival in a new settings or service as part of the handoff process. Standardize this line reconciliation process.

- Inform nonclinical staff, patients, families, and caregivers they must get help from clinical staff whenever there is a real or perceived need to connect or disconnect devices or tubing.

- Do not force connections; if it's difficult or not secure, it may not be the right pairing.

- Do not use adaptors unless they are very clearly intended for the application.

- Identify and minimize conditions and practices that may contribute to healthcare worker fatigue and take appropriate action.
  (FDA, 2017d)

Healthcare-Associated Infections (HAIs)

HAIs are considered system failures and are often preventable. The CDC reports that HAIs occur in approximately 1 in 25 hospital patients on any given day.

Common HAIs include:

- Catheter-associated urinary tract infections (CAUTIs)

- Surgical site infections (SSIs)

- Central line–associated bloodstream infections (CLABSIs)

- IV catheter–related bloodstream infections (CRBSIs)

- *Clostridium difficile (C. diff)* infections (CDIs)

- Healthcare-acquired pneumonia (HAP) and ventilator-associated pneumonia (VAP) (CDC, 2015; File, 2017)

Efforts have been made to reduce these infections, and research shows that when healthcare facilities and teams, individual doctors, and nurses become aware of the issue and take steps to prevent them, rates of some HAIs can decrease by more than 70%. Failure of physicians, nurses, and other caregivers to practice basic hand hygiene helps spread bacteria. Studies show that on average healthcare providers clean their hands less than half the times they should, contributing to the spread of HAIs (CDC, 2017a).

PREVENTING CATHETER-ASSOCIATED URINARY TRACT INFECTIONS

The CDC (2016a) 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.

- For operative patients requiring an indwelling catheter, remove as soon as possible, preferably within 24 hours.

- 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 adequately cleaned and disinfected between patients.

- Follow aseptic insertion; 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

- Use of antimicrobial/antiseptic-impregnated catheters

PREVENTING SURGICAL SITE INFECTIONS

CDC (2017c) recommendations for preventing surgical site infections include:

Before surgery:

- Administer antimicrobial prophylaxis in accordance with evidence-based standards and guidelines.

- Avoid inappropriate use of broad-spectrum antibiotics or prolonged courses of prophylactic antibiotics.

- Instruct patients to shower or bathe with soap or an antiseptic agent prior to operation.

- Avoid hair removal at the operative site unless it will interfere with the operation; use clippers, not razors.

- Use the appropriate antiseptic agent and technique for skin preparation in the period prior to surgery and immediately before the placement of surgical drapes.

During surgery:

- Keep OR doors closed during surgery except as needed for passage of equipment, personnel, and the patient.

- Use at least a 50% fraction of inspired oxygen intraoperatively and immediately postoperatively in select procedure(s).

- Exclude surgeons or other care providers with infections.

- Use closed suction drains.

- Do not apply topical antimicrobial agents to the surgical incision.

- Delay primary closure for heavily contaminated wounds.

- Consider the use of triclosan-coated sutures.

After surgery:

- Perform hand hygiene with each patient contact.

- Maintain immediate postoperative normothermia.

- Protect primary closure incisions with sterile dressing.

- Control blood glucose level during the immediate postoperative period.

- Discontinue antibiotics according to evidence-based standards and guidelines.

PREVENTING CENTRAL LINE–ASSOCIATED BLOODSTREAM INFECTIONS

CDC (2016b) guidelines for prevention of CLABSIs include a checklist that covers the following:

For clinicians:

- Promptly remove unnecessary central lines.
    - Perform daily audits to assess if each central line is still needed.
- Follow proper insertion practices.
    - Perform hand hygiene before insertion.
    - Adhere to aseptic technique.

- o Use maximal sterile barrier precautions (mask, cap, gown, sterile gloves, and sterile full body drape).

- o Perform skin antisepsis with >0.5% chlorhexidine with alcohol.

- o Choose the best site to minimize infections and noninfectious complications.

- o Avoid femoral site in obese adult patients.

- o Cover the site with sterile gauze or sterile, transparent, semipermeable dressings.

- Handle and maintain central lines appropriately.

  - o Comply with hand hygiene requirements.

  - o Bathe ICU patients over 2 months of age with chlorhexidine preparation on a daily basis.

  - o Scrub the access port or hub immediately prior to each use with an appropriate antiseptic (chlorhexidine, povidone iodine, an iodophor, or 70% alcohol).

  - o Access catheters only with sterile devices.

  - o Replace dressings that are wet, soiled, or dislodged.

  - o Perform dressing changes under aseptic technique using clean or sterile gloves.

For facilities:

- Ensure healthcare personnel are educated about indications for central lines, proper procedures for insertion and maintenance, and appropriate infection prevention measures.

- Empower staff to stop nonemergent insertion if proper procedures are not followed.

- "Bundle" supplies (e.g., in a kit) to ensure items are readily available for use.

- Provide the checklist above to clinicians to ensure all insertion practices are followed.

- Ensure efficient access to hand hygiene.

- Monitor and provide prompt feedback for adherence to hand hygiene.

- Provide recurring education sessions on central line insertion, handling, and maintenance.

Supplemental strategies:

- Use 2% chlorhexidine for bathing ICU patients over 2 months of age.

- Use antimicrobial/antiseptic-impregnated catheters.

- Use chlorhexidine-impregnated dressings.

PREVENTING IV CATHETER–RELATED BLOODSTREAM INFECTIONS

- For peripheral catheters, an upper extremity site is preferred in adults. In pediatric patients, the upper or lower extremities or the scalp (in neonates or young infants) can be used.

- Avoid steel needles when administering fluids and medications that might cause tissue necrosis if extravasation occurs.

- Wear clean gloves, rather than sterile, for insertion. Use sterile gloves when touching the catheter site after prepping the skin.

- Prep skin at insertion site with an alcohol/chlorhexidine solution, scrubbing back and forth for 30 seconds, and then air dry. If chlorhexidine is contraindicated, use tincture of iodine or 70% alcohol.

- Use sterile transparent dressing. If patient is diaphoretic or site is bleeding or oozing, use sterile gauze dressing until resolved.

- Do not use topical antibiotic ointment or creams on catheter insertion sites.

- Use closed IV catheter systems with integrated extension sets and stabilization platforms.

- Minimize contamination risk by scrubbing the access port with an appropriate antiseptic.

- Replace peripheral catheters no more frequently than every 72 to 96 hours. Replace peripheral catheters in children only when clinically indicated.

- Change needleless components at least as frequently as the administration set.

- Evaluate site by palpation and inspection at least every 2 hours with continuous infusions, or at least twice in a 24-hour period when IV site is locked for intermittent infusions.

- Remove peripheral venous catheters if patient develops signs of phlebitis, infection, or a malfunctioning catheter.

- Encourage patients to report any changes in their catheter site or any new discomfort.

- Assess the necessity of peripheral IV lines on a daily basis or per facility policy.

- Do not submerge catheter or catheter site in water when bathing or showering.

- Do not hang IV fluids mixed by pharmacy or nursing longer than 24 hours, unless otherwise indicated.

- Do not hang premixed fluids for adults longer than 96 hours.

- Change tubing for adults every 96 hours for continuous infusions or every 24 hours for intermittent infusions.
  (CDC, 2017d; CHCS, 2015)

PREVENTING CLOSTRIDIUM DIFFICILE INFECTIONS

- Use antimicrobials only as necessary.

- Perform hand hygiene per CDC/WHO recommendations. (Note that not all hand hygiene products are effective against *C. diff.*)

- Since spores may be difficult to remove from hands even with handwashing or hand sanitizer, adhere strictly to glove use.

- Presumptively isolate symptomatic patients pending confirmation of CDI.

- Isolate patients with CDI and initiate Contact Precautions immediately.

- Private rooms are preferred for patients with fecal incontinence.

- Maintain Contact Precautions until discharge, as patients continue to shed spores following treatment.

- Use disposable or dedicated patient care equipment (e.g., stethoscopes, BP cuffs, and thermometers).

- Clean room surfaces thoroughly on a daily basis and upon discharge or transfer.

- Clean and disinfect equipment and environment using EPA-approved sporicidal disinfectant.

- Communicate Contact Precautions at shift handoff and notify new facility on transfer.

- Implement an antimicrobial stewardship program.
  (CDC, 2017e)

PREVENTING MULTIDRUG-RESISTANT ORGANISM INFECTIONS

- Comply with hand hygiene as recommended by the CDC.

- Implement Contact Precautions when working with patients with MDRO infection and for those who have been previously identified as being colonized.

- Use antibiotics only when needed and for the shortest time possible.

- Place patients with an MDRO infection in a private room or share a room with others who have the same infection. When this is not possible, place in rooms with patients who are at low risk for acquiring an MDRO and who are likely to have short lengths of stay.

- Dedicate noncritical medical items (e.g., BP cuffs, stethoscopes, thermometers) for patients known to be infected or colonized with MDROs.

- Clean and disinfect all patient care items, equipment, and room surfaces every day; utilize a checklist to ensure compliance.

- Wear masks when performing splash-generating procedures, when caring for patients with open tracheostomies or potential projectile secretions, and in circumstances where there is evidence of transmission from heavily colonized sources such as burn wounds. (CDC, 2017f)

PREVENTING VENTILATOR-ACQUIRED LUNG INFECTIONS

- Follow routine infection control practices and hand hygiene.

- Keep head of bed elevated 30 to 45 degrees.

- Assess daily readiness for extubation.

- Change ventilator circuit if visibly soiled or mechanically malfunctioning.

- Use sterile suctioning techniques and handling of respiratory equipment.

- Perform oral care at least every 2 to 4 hours with an antiseptic swab to clean the oral cavity and teeth. Brush the teeth twice a day.

- Combine respiratory therapy with nursing in performance of oral care. (HRET, 2017)

Falls

Falls are common, especially for older adults, both in the community and in healthcare settings. The CDC estimates that 1 in 3 U.S. adults ages 65 or older and 50% to 75% of nursing home residents fall every year. The AHRQ states that between 70,000 and 1 million people fall in hospitals each year (ECRI Institute, 2016). Hip fractures are one of the most common types of serious injury resulting from a fall.

The CDC and ECRI consider both intrinsic and extrinsic factors that increase risk for falls. **Intrinsic factors** include issues that generally cannot be changed and concern the patient's medical, psychological, and physical issues (e.g., advanced age). **Extrinsic factors** are those that generally can be changed and involve environmental risks that patients encounter (e.g., lack of bathroom grab bars) (ECRI Institute, 2016; CDC, 2017b).

In 2008 the Centers for Medicare and Medicaid Services (CMS, 2015) stopped reimbursing for care resulting from injuries due to any in-hospital fall that could have been prevented.

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

PATIENT ASSESSMENT

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. A

reliable, standardized, and validated assessment tool should address history of falls, mobility problems, use of assistive devices, medications, and mental status. One such tool is the Morse Fall Scale (see below). The use of therapy assessment tools allow the therapist to make recommendations to the rest of the healthcare team on how best to prevent a fall for a specific patient receiving rehab therapy.

MORSE FALL SCALE (MFS)

The MFS is used widely in both hospital and long-term care inpatient settings. The MFS requires systematic, reliable assessment of a patient's fall risk factors upon admission, after a fall, upon change in status, and at discharge or transfer to a new setting. MFS subscales include assessment of:

Risk Factor	Score
History of falling, immediate or within 3 months	No = 0
	Yes = 25
Secondary diagnosis	No = 0
	Yes = 15
Ambulatory aid	None, bed rest, wheelchair, nurse = 0
	Crutches, cane, walker = 15
	Furniture = 30
IV/heparin lock	No = 0
	Yes = 20
Gait/transferring	Normal, bed rest, immobile = 0
	Weak = 10
	Impaired = 20
Mental status	Oriented to own ability = 0
	Forgets limitations = 15

MFS Score	Risk Level	Action
0–24	None	Basic nursing care
25–50	Low	Standard fall prevention interventions
51+	High	High-risk fall prevention interventions

Source: AHRQ, 2017g.

INPATIENT FALL PREVENTION

AHRQ (2017h) states that the cornerstone of any hospital's fall prevention program is the use of **universal fall precautions** because they apply to all patients at all times, regardless of fall risk. These precautions include:

- Familiarize the patient with the environment.

- Have the patient demonstrate call light use.

- Maintain call light within reach.

- Keep the patient's personal possessions within patient safe reach.

- Have sturdy handrails in patient bathrooms, room, and hallway.

- Place the hospital bed in low position when a patient is resting in bed; raise bed to a comfortable height when the patient is transferring out of bed.

- Keep hospital bed brakes locked.

- Keep wheelchair wheel locks in locked position when stationary.

- Keep nonslip, comfortable, well-fitting footwear on the patient.

- Use night lights or supplemental lighting.

- Keep floor surfaces clean and dry; clean up all spills promptly.

- Keep patient care areas uncluttered.

- Follow safe patient handling practices.

Once risk assessment is completed and universal fall precautions are in place, additional interventions are tailored to individual patient's needs. Examples may include:

- More intense supervision such as sitters, or 15-minute checks for a cognitively impaired patient who is agitated or tries to wander

- Participation in a mobility program through physical or occupational therapy for a patient with impaired gait or mobility at risk for deconditioning

- An hourly (scheduled) rounding protocol for all patients, during which toileting needs are assessed

INSTITUTIONAL STRATEGIES FOR ADDRESSING ERRORS

Changes in organizational culture, involvement of leadership, education of providers, development of patient safety committees, adoption of safe protocols and procedures, and use of technology are all essential strategies healthcare facilities must consider in their efforts to reduce medical errors.

Creating a Culture of Safety

The mistaken attitude in healthcare that errors are solely the fault of individual practitioners has proven a major barrier to reporting. Instead of analyzing the multiple factors that contribute to errors, past efforts have often focused on making clinicians more careful and reinforced by fear of punishment when they fail. This "culture of blame" bypasses the opportunity for analysis and corrective measures to prevent recurrence.

One of the main goals of organizations working to improve patient safety should be to encourage the creation of a "culture of safety" in which medical errors are discussed openly and addressed thoroughly. When an organization values safety, this commitment is evident throughout the organization from top management to the bedside. Creating a culture of safety requires:

- Recognition that errors occur and are a part of the healthcare industry, requiring a nonpunitive approach unless specific behavior warrants disciplinary action

- Effective teamwork, communications, and shared learning

- Recognition that it is everyone's role to watch for errors or system failures

- Openness or transparency, which indicates an acceptance of the human elements in error, and a conscious means of reporting any error, near miss, or identified potential for an error

- A "just culture" where retribution is confined to reckless or malicious behavior (see below)

- Accountability to ensure everyone is aware of their responsibility to maintain safety (AHRQ, 2016b)

JUST CULTURE MODEL

A culture of safety promotes open reporting of adverse events and risky situations, and even stop-work in certain situations, in a blame-free context. However, leaders must include the necessary component—a just culture. Such a culture does not default to punishment but rather makes an effort to determine if discipline is necessary when an incident occurs.

An important aspect of a just culture is the systematic, fair, and nonarbitrary method of determining system versus individual accountability. A just culture seeks to determine whether an incident was due to human error, at-risk behavior, or reckless behavior. Reckless behavior

may be grounds for disciplinary action and civil and/or criminal charges. Punishment may be the appropriate consequence, including termination (Moriates & Wachter, 2015).

Leadership

Organizational leadership plays a significant role in prioritizing patient safety, and there is a shift toward more direct oversight at the organizational level. Hospital boards use strategic initiatives to influence quality and safety, such as visits by management (walkarounds) to engage in open and frank discussions with frontline staff. 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.

Health Information Technology

Health information technology has great potential for improvement in the quality and safety of healthcare. Electronic health records (EHRs) should help reduce medication errors, avoid the need to repeat laboratory tests, and improve continuity of care across the healthcare system. Facilities should carefully select the best system available, adopt best practices for EHR implementation and management, monitor how the health information technology system is used, and report any adverse events.

AGENCY, FEDERAL, AND STATE OVERSIGHT EFFORTS

Oversight of healthcare quality in the United States is accomplished through both professionally based accrediting bodies in the private sector and through federal and state regulatory agencies.

The Joint Commission

The Joint Commission (TJC) is an independent, not-for-profit agency whose mission is to continuously improve the safety and quality of care provided to the public. The TJC certifies healthcare organizations and programs in the United States that voluntarily seek accreditation and certification. The standards of the Joint Commission focus on patient safety and quality of care.

SENTINEL EVENT POLICY

The Joint Commission encourages, but does not require, reporting of any sentinel event. However, in the interest of continuous improvement in safety and quality of care, the Joint Commission requires that healthcare organizations:

- Have a process in place to recognize sentinel events

- Conduct thorough and credible root cause analyses that focus on process and system factors, not on individual blame

- Document a risk-reduction strategy and internal corrective action plan within 45 days of the organization becoming aware of the sentinel event

The sentinel event policy has four **goals**:

1. To have a positive impact in improving patient care, treatment, and services and preventing sentinel events

2. To focus the attention of an organization that has experienced a sentinel event on understanding the factors that contributed to the event (such as underlying causes, latent conditions and active failures in defense systems, or organizational culture) and on changing the organization's culture, systems, and processes to reduce the probability of such an event in the future

3. To increase the general knowledge about sentinel events, their contributing factors, and strategies for prevention

4. To maintain the confidence of the public and accredited organizations in the accreditation process
   (TJC, 2017a)

Although accredited facilities are expected to identify and respond appropriately to all sentinel events, but not to report them, if the Joint Commission becomes aware of an event, facilities are required to submit the findings of their root cause analyses and corrective action plans. This information can be included in the Joint Commission's review of sentinel events, helping to track national trends and develop strategies for improving patient safety.

NATIONAL PATIENT SAFETY GOALS

The Joint Commission's National Patient Safety Goals program assists accredited organizations to address emerging areas of concern regarding patient safety and advises on how best to address them. Such areas of concern include:

- Hand hygiene

- Hand-off communications

- Preventing avoidable heart failure hospitalizations

- Preventing falls

- Preventing surgical site infection

- Reducing sepsis mortality

- Safety culture

- Safe and effective use of insulin

- Safe surgery
(TJC, 2017b)

Misreading medical abbreviations can also 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.

ROOT CAUSE ANALYSIS (RCA)

The Joint Commission has mandated the use of RCA to analyze sentinel events since 1997. It requires that a thorough, credible root cause analysis and corrective action plan be performed for each reported sentinel event within 45 days of the event's occurrence or of the organization's becoming aware of the event (TJC, 2017c). RCA is conducted by a multidisciplinary team through record review and participant interviews with the **purpose** of identifying:

- What happened (the course of events)

- Why an incident happened (the root cause or causes)

- How to prevent it from occurring again in the future (corrective actions)

Root cause analysis does not seek to lay blame on individuals for errors but rather to work toward preventing them.

Strategies for an effective root cause analysis include:

- Find and resolve latent conditions as well as root causes.

- Treat the cause rather than trying to change people.

- Follow through to ensure change.

A thorough and credible root cause analysis should:

- Be precise

- Be accurate

- Be relevant

- Be complete

- Be systematic

- Possess depth

- Possess breadth of scope
(AHRQ, 2017c)

Accreditation Association for Ambulatory Health Care

The Accreditation Association for Ambulatory Health Care (AAAHC) was founded in 1999 by the AAAHC Institute for Quality Improvement, which offers ambulatory healthcare organizations opportunities to learn about and become involved in performance measurement, benchmarking, and quality improvement. Since its beginning, the AAAHC has promoted a voluntary, peer-based, consultative, and education survey process to advance patient care.

Ambulatory care organizations are offered accreditation by AAAHC to demonstrate that the organization takes part in ongoing self-evaluation, peer review, and education to continuously improve its care and services. The organization performs on-site surveys by healthcare professionals at least every three years (AAAHC, 2016).

Federal Government Efforts

In 2006, Congress passed the Deficit Reduction Act of 2005, authorizing Medicare and Medicaid to tie healthcare facilities' Medicare eligibility to the occurrence of preventable never events, and in 2007 the Center for Medicare and Medicaid Services issued a new rule denying reimbursement to hospitals for treatment of preventable errors, injuries, and infections (CMS, 2015).

PREVENTABLE COMPLICATIONS (NEVER EVENTS) NOT COVERED BY MEDICARE AND MEDICAID

The following preventable complications are not reimbursed by Medicare and Medicaid if acquired during an inpatient stay:

- Foreign object retained after surgery

- Air embolism

- Blood incompatibility

- Stage III and IV pressure ulcers

- Falls and trauma:

    o Fractures and dislocation

    o Intracranial injuries

    o Burns

    o Crushing injuries

    o Other injuries

- Manifestations of poor glycemic control:

- o Diabetic ketoacidosis

- o Nonketotic hyperosmolar coma

- o Secondary diabetes with ketoacidosis

- o Secondary diabetes with hyperosmolarity

- Catheter-associated urinary tract infection

- Vascular catheter-associated infection

- Surgical site infection following:

  - o Mediastinitis following coronary artery bypass graft

  - o Bariatric surgery for obesity

  - o Laparoscopic gastric bypass

  - o Gastroenterostomy

  - o Laparoscopic gastric restrictive surgery

- Surgical site infection following certain orthopedic procedures:

  - o Spine

  - o Neck

  - o Shoulder

  - o Elbow

- Surgical site infection following cardiac implantable electronic device

- Deep vein thrombosis/pulmonary embolism following total knee or hip replacement

- Iatrogenic pneumothorax with venous catheterization

Medicare and Medicaid also will not reimburse for wrong-site, wrong-procedure, and wrong-patient surgery.

Source: CMS, 2015.

Florida Statutory Requirements

SENTINEL EVENT REPORTING

Reporting sentinel events to the Joint Commission is voluntary. However, Florida law makes such reporting mandatory. Florida's Comprehensive Medical Malpractice Reform Act of 1985 (F.S. 395.0197) mandates that each licensed hospital and ambulatory surgery center implement a risk-management program with state oversight and an internal incident-reporting system. State

oversight is provided by the Florida Agency for Health Care Administration (AHCA). Each licensed facility is required to hire a risk manager, licensed under F.S. 395–10974, who is responsible for implementation and oversight of the risk management program.

INTERNAL RISK MANAGEMENT PROGRAM REQUIREMENT

Florida Statutes require every licensed facility 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:

    o 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

- Have an incident reporting system to report adverse incidents to the risk manager or designee within three business days after their occurrence

ADVERSE INCIDENT REPORTING

F.S. 395.0197 mandates internal reporting within three business days of any adverse incident (event) over which healthcare personnel could exercise control, 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

AHCA CODE 15 AND ANNUAL REPORTING

Licensed facilities in Florida are required to submit two types of reports to AHCA: Code 15 reports and annual reports.

Code 15 reports must be submitted to the AHCA using the online Adverse Incident Reporting System (AIRS) within 15 calendar days after its occurrence for any of the following adverse incidents, whether occurring in the licensed facility or arising from healthcare prior to admission to the licensed facility:

- Death of a patient

- Brain or spinal damage

- Surgical procedure on the wrong patient

- Wrong-site surgical procedure

- Surgical procedure that is medically unnecessary or unrelated to patient diagnosis or medical condition

- Surgical report of damage from a planned surgical procedure, where damage is not a recognized specific risk

- Procedures performed to remove unplanned foreign objects remaining postoperatively

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

For nearly two decades, patient safety has been a topic of both national and international concern. Everyone has a stake in the safety of the healthcare system—healthcare workers as well as the general public. In the past, patient safety was not a traditional part of the education of most healthcare workers, but today this is no longer true. All healthcare workers are being actively educated about their roles in the prevention of avoidable negative outcomes for those we care for. It is essential that we all understand the journey every patient makes through the system, recognizing how the system can fail and what can be done 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

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

Florida Statutes
http://www.leg.state.fl.us/statutes

Hospital Safety Score
http://www.hospitalsafetyscore.org

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

National Patient Safety Foundation
http://www.npsf.org

National Quality Forum
http://www.qualityforum.org

REFERENCES

Accreditation Association for Ambulatory Health Care (AAAHC). (2016). Accreditation handbook for ambulatory health care. Retrieved from https://www.aaahc.org/Global/Handbooks/2016/HB16_FNL-interactive_v2.pdf

Agency for Healthcare Research and Quality (AHRQ). (2017a). Agency for Healthcare Research and Quality national patient safety goals. Retrieved from https://psnet.ahrq.gov/resources/resource/2230#

Agency for Healthcare Research and Quality (AHRQ). (2017b). Adverse events, near misses, and errors. Retrieved from https://psnet.ahrq.gov/primers/primer/34/adverse-events-near-misses-and-errors

Agency for Healthcare Research and Quality (AHRQ). (2017c). Systems approach. Retrieved from https://psnet.ahrq.gov/primers/primer/21/systems-approach

Agency for Healthcare Research and Quality (AHRQ). (2017d). Wrong-site, wrong-procedure, and wrong-patient surgery. Retrieved from https://psnet.ahrq.gov/primers/primer/18/wrong-site-wrong-procedure-and-wrong-patient-surgery

Agency for Healthcare Research and Quality (AHRQ). (2017g). Leadership role in improving safety. Retrieved from https://psnet.ahrq.gov/primers/primer/32/leadership-role-in-improving-safety

Agency for Healthcare Research and Quality (AHRQ). (2017h). Module 3: best practices in fall prevention—training guide. Retrieved from https://www.ahrq.gov/professionals/systems/hospital/fallpxtraining/workshop/module3/mod3-trguide.html

Agency for Healthcare Research and Quality (AHRQ). (2016a). National scorecard on rates of hospital-acquired conditions 2010 to 2015: interim data from national efforts to make health care safer. Retrieved from http://www.ahrq.gov/professionals/quality-patient-safety/pfp/2015-interim.html

Agency for Healthcare Research and Quality (AHRQ). (2016b). Culture of safety. Retrieved from https://psnet.ahrq.gov/primers/primer/5/safety-culture

Agency for Healthcare Research and Quality (AHRQ). (2003). AHRQ's patient safety initiative: building foundations, reducing risk. Chapter 2: efforts to reduce medical errors: AHRQ's response to senate committee on appropriations questions. Retrieved from https://archive.ahrq.gov/research/findings/final-reports/pscongrpt/psini2.html

California Legislature. (2015). AB-444 health-facilities: epidural and enteral feeding connectors. Retrieved from http://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill id=201520160AB444

Carolinas Health Care System (CHCS). (2015). Preventing IV catheter associated infections. Retrieved from https://www.carolinashealthcare.org/documents/ACEModules/BlueRidge/Prevent-IV-Cath-Infections.pdf

Centers for Disease Control and Prevention (CDC). (2017a). Clean hands count for safe healthcare. Retrieved from https://www.cdc.gov/features/handhygiene/index.html

Centers for Disease Control and Prevention (CDC). (2017b). Risk factors for falls. Retrieved from https://www.cdc.gov/steadi/pdf/risk_factors_for_falls-a.pdf

Centers for Disease Control and Prevention (CDC). (2017c). Surgical site infection (SSI). Retrieved from https://www.cdc.gov/infectioncontrol/guidelines/ssi/index.html

Centers for Disease Control and Prevention (CDC). (2017d). Guidelines for the prevention of intravascular catheter-related infections. Retrieved from https://www.cdc.gov/infectioncontrol/guidelines/bsi/recommendations.html

Centers for Disease Control and Prevention (CDC). (2017e). Clostridium difficile infection (CDI). Retrieved from https://www.cdc.gov/hai/prevent/tap/cdiff.html

Centers for Disease Control and Prevention (CDC). (2017f). Multidrug-resistant organisms (MDRO) management. Retrieved from https://www.cdc.gov/infectioncontrol/guidelines/mdro/index.html

Centers for Disease Control and Prevention (CDC). (2016a). Catheter-associated urinary tract infections (CAUTI). Retrieved from https://www.cdc.gov/infectioncontrol/guidelines/cauti/index.html

Centers for Disease Control and Prevention (CDC). (2016b). Central line-associated bloodstream infection (CLABSI). Retrieved from https://www.cdc.gov/hai/bsi/bsi.html

Centers for Disease Control and Prevention (CDC). (2015). Healthcare-associated infections. Retrieved from https://www.cdc.gov/hai/organisms/cdiff/cdiff_clinicians.html

Centers for Medicare and Medicaid Services (CMS). (2015). Hospital-acquired conditions. Retrieved from https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Hospital-Acquired_Conditions.html

ECRI Institute. (2016). Falls. Retrieved from https://www.ecri.org/components/HRC/Pages/SafSec2.aspx?tab=2

File T. (2017). Treatment of hospital-acquired and ventilator-associated pneumonia in adults. UpToDate. Retrieved from https://www.uptodate.com/contents/treatment-of-hospital-acquired-and-ventilator-associated-pneumonia-in-adults

Health Research and Educational Trust (HRET). (2017). Preventing ventilator-associated events. Retrieved from http://www.hret-hiin.org/Resources/vae/17/HRETHIIN_VAE_ChangePackage_508.pdf

Institute for Healthcare Improvement (IHI). (2017). New survey finds 21% of Americans report personal experience with medical errors. Retrieved from http://www.ihi.org/about/news/Pages/New-Survey-Looks-at-Patient-Experiences-With-Medical-Error.aspx

The Joint Commission (TJC). (2017a). Sentinel event policy and procedures. Retrieved from https://www.jointcommission.org/sentinel_event_policy_and_procedures/

The Joint Commission (TJC). (2017b). Center for transforming healthcare: projects. Retrieved from http://www.centerfortransforminghealthcare.org/mobile/projects/

The Joint Commission (TJC). (2017c). Framework for conducting a root cause analysis and action plan. Retrieved from https://www.jointcommission.org/framework_for_conducting_a_root_cause_analysis_and_action_plan/

Kavanagh K, Saman D, Bartel R, & Westerman K. (2017). Estimating hospital-related deaths due to medical error. Journal of Patient Safety, 13(1), 1–5.

Medical Device and Diagnostic Industry (MD+DI). (2016). ISO 80369 is coming—will you be ready? Retrieved from https://www.mddionline.com%E2%80%94will-you-be-ready

Moriates C & Wachter R. (2015). Accountability in patient safety. Retrieved from https://psnet.ahrq.gov/perspectives/perspective/189/

National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). (2018). Two decades of coordinating medication safety efforts. Retrieved from http://www.nccmerp.org/sites/default/files/20_year_report.pdf

National Quality Forum (NQF). (2017). Serious reportable events. Retrieved from http://www.qualityforum.org/topics/sres/serious_reportable_events.aspx

Novak R. (2016). Anesthesia complications: malpractice or not? Retrieved from https://theanesthesiaconsultant.com/2016/05/04/anesthesia-errors-and-complications-malpractice-or-not/

Nwagwu V. (2016). Rights of medication administration and management. Retrieved from https://ucedd.georgetown.edu/DDA/documents/NursingRTMarch2016.pdf

PSNet. (2003). WebM&M: cases and commentary: medication overdose. Retrieved from https://psnet.ahrq.gov/webmm/case/9/medication-overdose

U.S. Food and Drug Administration (FDA). (2017a). Medical device connectors. Retrieved from https://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/GeneralHospitaloDevicesandSupplies/TubingandLuerMisconnections/default.htm

U.S. Food and Drug Administration (FDA). (2017b). Device adverse event reports over time. Retrieved from https://open.fda.gov/device/event/

U.S. Food and Drug Administration (FDA). (2017d). Examples of medical device misconnections. Retrieved from https://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm313275.htm

Volpe C, Aguiar L, Pinhoo D, & Stival M. (2016). Risk factors for medical errors in the electronic and manual prescription. Rev. Latino-Am. Enfermagn, 24. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4990040/

Welch M. (2017). Patient positioning for surgery and anesthesia in adults. UpToDate. Retrieved from https://www.uptodate.com/contents/patient-positioning-for-surgery-and-anesthesia-in-adults

Woods M. (2017). Preventing medication errors in pharmacy. Specialty Pharmacy Times. Retrieved from https://www.specialtypharmacytimes.com/news/preventing-medication-errors-in-pharmacy

World Health Organization (WHO). (2017a). WHO surgical safety checklist. Retrieved from http://www.who.int/patientsafety/topics/safe-surgery/checklist/en/

World Health Organization (WHO). (2017b). WHO launches global effort to halve medication-related errors in 5 years. Retrieved from http://www.who.int/mediacentre/news/releases/2017/medication-related-errors/en/

Zejnullahu V, Bicaj B, Zejnullahu V, & Hamza A. (2017). Retained surgical foreign bodies after surgery. Open Access Maced J. Med. Sci, 5(1), 97–100.

Zhu J & Weingart S. (2017). Prevention of adverse drug events in hospitals. UpToDate. Retrieved from https://www.uptodate.com/contents/prevention-of-adverse-drug-events-in-hospitals

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TEST

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1. Which is a **correct** statement about the scope of the problem of medical errors?

    a. The number of deaths from medical errors continues to rise.

    b. There is well-established means for calculating mortality caused by medical harm.

    c. Medical errors are declining in number.

    d. Medical errors are the tenth leading cause of death in the United States.

2. An adverse event is defined as:

    a. The use of the wrong plan to achieve a certain aim.

    b. The failure of a planned action to be completed as intended.

    c. A failure to solve problems of practice, procedures, or systems and to make appropriate changes.

    d. An act leading to an undesirable outcome unrelated to a patient's underlying condition.

3. The National Quality Forum's list of extremely rare "serious reportable events" (SREs) are also referred to as:

    a. Negligence.

    b. Never events.

    c. Near misses.

    d. Latent events.

4. The most common cause of medical errors is:

    a. Inadequate staff or supervision.

    b. Technical failure of equipment.

    c. Breakdown in communication.

    d. Deficiency in education and training.

5. Which is a **correct** statement about a surgical safety checklist?

    a. Checklists improve communication among operating room staff.

    b. Checklists have had no impact on postoperative complications.

    c. Checklists do not require extensive staff interaction.

    d. Checklists are not effective in detecting potential safety hazards.

6. Most medication errors occur when drugs are being:
    a. Prescribed and transcribed.
    b. Compounded and packaged.
    c. Dispensed and administered.
    d. Monitored and discontinued.

7. Which is a **correct** statement regarding the prevention of medication errors?
    a. Use only computerized medical records.
    b. Compare the dispensed dose with the medication order.
    c. Prepare all medications well in advance of administering them.
    d. Treat side effects with another medication.

8. Recommendations to reduce the incidence of line and tubing misconnections include:
    a. Requiring that all Luer locks be discontinued.
    b. Designing equipment to make IV and enteral systems incompatible.
    c. Eliminating tubing that contains phthalates.
    d. Using catheters that have injection ports.

9. Which is a **correct** action for avoiding central line–associated bloodstream infections?
    a. Performing audits every 7 days to assess the need for each central line
    b. Accessing catheters only with sterile devices
    c. Avoiding the femoral artery site in children
    d. Providing a yearly in-service to new healthcare staff

10. Which is an example of an **intrinsic** risk factor for falls?
    a. Lack of stair handrails
    b. Postural hypotension
    c. Improper footwear
    d. Dim lighting

11. In addition to universal fall precautions, which intervention is recommended for a hospitalized therapy patient with a fall risk related to impaired gait?
    a. Frequent rounds to meet toileting needs
    b. More intense supervision by sitters
    c. Maintaining bedrest until discharge
    d. Participation in a mobility program

12. A practice that promotes a culture of safety is:

    a. Creating a blame-free environment.

    b. Clearly spelling out the penalties for reporting safety violations.

    c. Filing incident reports at the end of every month.

    d. Establishing staff and patient error committees.

13. The purpose for a root cause analysis of an error is to:

    a. Determine who was at fault.

    b. Find ways to prevent the error from occurring again.

    c. Reeducate the person who made the error.

    d. Determine the impact of the error on the patient.

14. According to Florida law, reporting of sentinel events is:

    a. Voluntary.

    b. Mandatory.

    c. Recommended.

    d. Not required.

15. Florida statutes require Code 15 reports to be submitted within what time period after an incident's occurrence?

    a. 48 hours

    b. 3 days

    c. 7 business days

    d. 15 calendar days