County of Los Angeles
Department of Health Services

NURSING INPATIENT

Annual Core Competency Study Guide

2017
Licensed Patient Care Areas
# 2017 DHS Annual Nursing Inpatient Competency Study Guide
## Licensed Workforce Members

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To be completed by licensed nurses in patient care and non-patient care areas

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- Safe Patient Handling
- Prevention of Pressure Ulcers
- Injury Prevention
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Section II: Medication Administration
To be completed by licensed nurses in patient care areas only

- Medication Safety
- Medication Calculation

Section III: Performance Stations
To be completed by licensed nurses in patient care areas only

- Injury Prevention
- Fall Prevention

*References

*Study Guide References are available upon request. You may also access study guide and references by using the L.A. County Intranet as follows:

**Share Point**
1. Go to: http://myladhs.lacounty.gov
2. Click the **Organization** tab located on top bar of page and select/click **Health Services Administration**
3. Right of the drop-down menu, select/click **Office of Nursing Affairs (ONA)**
4. On the left side of the ONA page, under Nursing Affairs, select/click **Education Compliance Program (ECP)**
5. On the ECP page, left side, select/click **Nursing Inpatient Study Guides 2017**
6. Select your appropriate Study Guide, references can be found at the end of the study guide.

**Learning Net**
1. Go to: http://myladhs.lacounty.gov
2. Click the **Applications** tab located on top bar of page
3. Select/click **Department of Health Services** located on the left drop-down menu of the Applications tab
4. To the right of Department of Health Services tab, locate **DHS Applications** drop-down menu, select/click **Learning Net**
5. On the Learning Net login page, enter your e-number/c-number and password (same as timesheet)
6. Type “nursing” in the **Browse** field at the top of the page, hit enter on your keyboard and click **Launch** next to your appropriate Study Guide.
This study guide is designed to update the licensed nursing workforce members on important issues that assist them in providing safe and competent patient care. The study guide is divided into three sections.


**Section II** – Medication Administration includes competencies related to medication safety and medication calculation.

**Workforce Members as applicable are required to complete written exams for Section I and Section II with a minimum score of 80% for each Section.**

**Section III** – Performance Stations include the following competencies: Injury Prevention, Fall Prevention.

The table below describes which workforce members must complete the above sections of the study guide and testing components:

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<td>• Assistant Nursing Directors (not responsible for patient care areas)</td>
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**NOTE:**
1. RNs and LVNs identified in the above table, working in Labor and Delivery, complete the inpatient and applicable perioperative competencies.
2. RNs identified in the above table, working in the Operating Room, complete the perioperative competencies.
3. If your position is not listed in the table or you are not sure in which category you belong consult your immediate supervisor.
COMPETENCY ASSESSMENT REQUIREMENT

Your attendance at the scheduled competency assessment is mandatory. Failure to participate in competency assessment as scheduled will be considered a “fail.” Workforce members will be provided consideration based upon proof of extenuating circumstances on a case-by-case basis. (DHS Policy & Procedure # 780.200: Competency Assessment – Direct & Indirect Patient Care Positions). If you need to be absent or have a circumstance that prevents your attendance on your test date/time, immediately contact your supervisor or manager.

INSTRUCTIONS FOR COMPLETING THIS STUDY GUIDE

1. Review the content in each section as indicated in the preface.
2. Complete the study questions at the end of each section.
3. Clinical Nurse Specialists, Clinical Nurse Educators, Nursing Instructors, and Nurse Managers are available to answer any questions you may have regarding the content.

NEED FOR ACCOMMODATION

If you need an accommodation, please advise your manager prior to confirming your date to take the competency exam.

Education Compliance Program (ECP)

Questions related to competency testing can be directed to the ECP
(213) 240-8449
2017 NATIONAL PATIENT SAFETY GOALS

Objectives:

Upon completion of this section, the workforce member will be able to:

1. State the purpose of National Patient Safety Goals (NPSGs)
2. Identify the 2017 NPSGs for hospitals
3. Describe nursing roles and responsibilities related to implementation of the 2017 NPSGs
4. Identify the three components of the Universal Protocol
5. Describe healthcare team roles and responsibilities during the “time out” procedure

I. Introduction

The Joint Commission developed the National Patient Safety Goal program using evidence- and expert-based data to address significant patient safety concerns and reduce the risk of adverse events (The Joint Commission, 2012). The Joint Commission requires accredited healthcare organizations to comply with the National Patient Safety Goals (NPSGs). The Joint Commission develops, evaluates, and revises the NPSGs on an annual basis, with the goal to highlight significant patient care issues and identify system-wide patient safety improvements (The Joint Commission, 2011). While some goals are revised or deleted, others become part of The Joint Commission Standards.

Although there are no new NPSGs for 2017, The Joint Commission (2016) has expanded evidence-based guidelines and elements of performance related to the prevention of Catheter-Associated Urinary Tract Infections (CAUTI) (NPSG.07.06.01). The expanded guidelines address education of staff, licensed independent practitioners, and patients/families regarding the use of indwelling catheters and the importance of infection prevention. In addition, the elements of performance include the need to develop written criteria for indwelling catheter placement and procedures for the insertion and maintenance of indwelling catheters. Finally, measuring and monitoring of catheter-associated urinary tract infection prevention processes and outcomes are also addressed (The Joint Commission, 2016). The Universal Protocol is also a critically important component of the NPSGs that is designed to ensure patient safety by preventing wrong site, wrong procedure, and wrong person procedures. There are many strategies hospitals may use to achieve the NPSGs and nursing plays a critical role in ensuring patient safety by implementing these strategies.

II. 2017 National Patient Safety Goals for hospitals: (NPSG #1, 2, 3, 6, 7, 15):

A. NPSG #1: Improve the accuracy of patient identification
   - Use at least two patient identifiers when providing care, treatment, or services (NPSG.01.01.01)
   - Eliminate transfusion errors related to patient misidentification (NPSG.01.03.01)

B. NPSG #2: Improve the effectiveness of communication among caregivers
   - Report critical results of tests and diagnostic procedures on a timely basis (NPSG.02.03.01)

C. NPSG #3: Improve the safety of using medications
   - Label all medications, medication containers, and other solutions on and off the sterile field in perioperative and other procedural settings (NPSG.03.04.01)
2. Reduce the likelihood of patient harm associated with the use of anticoagulant therapy (NPSG.03.05.01)

3. Maintain and communicate accurate patient medication information (NPSG.03.06.01)

**D. NPSG #6: Reduce the harm associated with clinical alarm systems**

1. Improve the safety of clinical alarm systems (NPSG.06.01.01)

**E. NPSG #7: Reduce the risk of healthcare-associated infections**

1. Comply with either the current Centers for Disease Control and Prevention (CDC) or the current World Health Organization (WHO) hand hygiene guidelines (NPSG.07.01.01)

2. Implement evidence-based practices to prevent healthcare-associated infections due to Multidrug-Resistant Organisms (MDRO) in acute care hospitals (NPSG.07.03.01)

3. Implement evidence-based practices to prevent Central Line-Associated Bloodstream Infections (CLABSI) (NPSG.07.04.01)

4. Implement evidence-based practices for preventing Surgical Site Infections (SSI) (NPSG.07.05.01)

5. Implement evidence-based practices to prevent indwelling Catheter-Associated Urinary Tract Infections (CAUTI) (NPSG.07.06.01)

**F. NPSG #15: The organization identifies safety risks inherent in its patient population**

1. Identify individuals at risk for suicide (NPSG.15.01.01)

**III. Safety Goal Guidelines**

Acute care hospitals use a variety of strategies to successfully meet the NPSGs. The Joint Commission monitors compliance to ensure the NPSGs are incorporated into practice. In this section, strategies to meet the NPSGs are presented. Additionally, each facility has specific policies and procedures in place to meet these goals. Workforce members must follow DHS and facility-specific policies.

**A. NPSG #1: Improve the accuracy of patient identification**

1. Mistakes related to patient misidentification occur throughout all phases of diagnosis and treatment and greatly jeopardize patient safety. The purpose of this goal is to first accurately identify the patient who is supposed to receive a particular treatment or service and then ensure that patient actually receives the correct service or treatment.

2. Use at least two patient identifiers when providing care, treatment, and services (NPSG.01.01.01). The following are examples of strategies that may be implemented to improve patient identification:

   a. Healthcare providers must use at least two patient identifiers prior to any treatment, medication, clinical intervention, or patient encounter.
   
   b. Patient identifiers include **Patient’s Name and one of the following:**

   • Medical Record Number (MRN)
   • Birthdate
c. Patient’s room number/physical location must not be used as a patient identifier.

d. Each patient is issued a patient identification card/band once identification is confirmed. The card/band will have the patient’s full name (last name, first name), date of birth, (Month, Day, Year in numerical format), and permanent MRN.

e. Patients with same or similar names should be housed in separate rooms or wards/units whenever possible. A “name alert” sticker should be placed on the patient identification card/plate, medication administration record, and chart of patients with similar names or John Does. It is highly recommended that caregivers communicate name alert during the hand off communication process.

f. If the patient requires emergency admission/evaluation prior to the identification process, a temporary medical record (temporary name and MRN) is issued.

g. After delivery, mother and infant should not be separated until they are identified and identification bands are applied to each.

h. Laboratory specimen containers must be labeled in the presence of the patient. This topic is particularly significant because mislabeling of specimens occurs relatively frequently and the consequences can be severe. The patient may receive an incorrect or delayed diagnosis or the wrong procedure/medication/other treatment or fail to receive necessary procedure/medication/other treatment, suffer a long-term disability, or die.

3. Eliminate transfusion errors related to patient misidentification (NPSG.01.03.01). The following are examples of strategies that may be implemented to prevent patient misidentification during transfusion:

a. Prior to a blood transfusion, the patient must be matched to the blood or blood component and order during a two-person bedside or chair-side process using at least two patient identifiers.

b. The person who will administer the blood and another individual qualified to administer blood must conduct the verification.

c. Staff must directly compare and verify the patient’s name and MRN on the patient identification band against identification printed on relevant documents prior to administering blood or blood components.

B. NPSG #2: Improve the effectiveness of communication among caregivers

1. Report results of critical tests and diagnostic procedures on a timely basis (NPSG.02.03.01).

a. Critical test/procedure results may alert the responsible licensed caregiver of a life-threatening situation and therefore must be reported immediately so that the patient can be treated promptly.

b. Nursing staff must follow facility-specific policy for addressing the process of immediate reporting.

c. Hospitals must develop written procedures for handling critical test and diagnostic procedure results.

C. NPSG #3: Improve the safety of using medications

1. Label all medications, medication containers, and other solutions on and off the sterile field in perioperative and other procedural settings (NPSG.03.04.01).

a. Medications in unlabeled containers are unidentifiable. Therefore, medications removed from their original containers must be labeled in order to prevent medication errors, including medications placed in syringes, medicine cups, and basins.
b. Labeling must occur when any medication or solution is transferred from the original packaging to another container, but not immediately administered. All original medication/solution containers must remain available for reference in the perioperative/procedural area until the procedure is completed.

c. Medications or solutions that are found unlabeled must be immediately discarded.

d. Medication or solution labels must include the following:
   - Medication or solution name
   - Strength
   - Amount of medication or solution containing medication (if not apparent for the container)
   - Diluent name and volume (if not apparent from the container)
   - Expiration date when not used within 24 hours
   - Expiration time when expiration occurs in less than 24 hours

e. Additional labeling requirements are reviewed in the “Medication Safety” competency included in Section II of this study guide.

f. Verify all medications or solution labels verbally and visually. Whenever the person preparing the medication or solution is not the person who will be administering it, verification must be performed by two people who are qualified to participate in the procedure.

2. Reduce the likelihood of patient harm associated with the use of anticoagulant therapy (NPSG.03.05.01).

a. Anticoagulation medications carry a high risk of causing harm due to complex dosing, inadequate monitoring, and inconsistent patient compliance.

b. An Anticoagulation Management Program must be implemented to individualize the care provided to each patient receiving anticoagulant therapy. This includes initial and ongoing monitoring of pertinent laboratory tests for patients receiving anticoagulant therapy.

c. Other components of this goal include the use of unit dose, pre-filled syringes, premixed infusions, development of related protocols, evaluation of drug and food interactions, and education of staff, patients, and families.

d. Warfarin therapy requires International Normalized Ratio (INR) monitoring before and during therapy. Assess baseline coagulation status before starting patients on warfarin. Use a current INR to adjust warfarin therapy. Baseline status and current INR is documented in the medical record.

e. Continuous intravenous heparin infusions must be administered using a programmable pump.

f. Patient education is a critical aspect of any Anticoagulation Management Program. A professional caregiver is responsible for ensuring the patient receiving anticoagulant therapy understands the risks, safety measures, and the need for regular laboratory monitoring.

3. Maintain and communicate accurate patient medication information (NPSG.03.06.01).

a. The Joint Commission requires medication reconciliation and defines it as the process of comparing the medications that a patient is currently taking (and should be taking) with the newly ordered medications.

b. The purpose of reconciliation is to avoid errors of transcription, omission, duplication of therapy, and medication interactions.

c. The process of medication reconciliation includes:
   - Creating a list of medications the patient is taking at home at the time of admission, including dose, route, and frequency of each medication
• Comparing the list with medications to be administered during hospitalization to assess for potential adverse medication interactions
• Maintaining and updating the patient’s home medication list and current hospital medication list
• Reconciling the medication lists when the patient is admitted to the hospital, transferred within the hospital, or discharged from the hospital
• Addressing discrepancies (including omissions, duplications, adjustments, deletions or additions) found during reconciliation

d. The Joint Commission (2011) states that a “good-faith effort” to gather this information meets the aim of NPSG.03.06.01.
e. The Joint Commission mandates that hospitals educate patients about the importance of keeping medication information current and updated.
f. Hospitals are also required to give patients/family written information regarding the medications the patient should be taking when discharged from the hospital.

D. NPSG #6: Improve the safety of clinical alarm systems

1. The purpose of setting alarms is to notify caregivers promptly of an impending or actual patient problem so interventions may be initiated to prevent the patient’s condition from deteriorating. However, when clinical alarms are not set properly, serious consequences can occur (The Joint Commission, 2013).

2. A number of problems related to clinical alarm setting can occur that may jeopardize patient safety. These problems include:
   a. Alarms being difficult to detect
   b. Noise from multiple alarms causing staff to become desensitized, to ignore them, or even turn them off
   c. Too many devices having alarms
   d. Default settings being inappropriately set
   e. Alarm limits being set too narrowly or too wide
   f. Alarms not functioning properly

3. Hospitals are expected to develop a well-planned and organized approach to coordinating the use of clinical alarm systems. The Joint Commission is most concerned about clinical alarms that have the most direct impact on patient safety. Ideally, clinical alarm management should be standardized. However, the Joint Commission recognizes that plans may have to be tailored to meet the needs of various hospitals, specialty clinical units, individuals or groups of patients.

4. The Joint Commission requires that leaders establish alarm system safety as a hospital priority and that they identify the most important alarm signals to manage based on the following:
   a. Input from medical staff and clinical departments
   b. Risk to patient if alarm signal is not attended to or it malfunctions
   c. Whether specific alarm signals are needed or just unnecessarily add to alarm noise and fatigue
   d. Potential for patient harm based on previous incidents at the hospital
   e. Published best practice guidelines
5. As of January 1, 2016, hospitals must implement policies and procedures for managing the alarms identified above which, at a minimum, address the following:
   a. Clinically appropriate alarm settings
   b. When alarms can be disabled
   c. When alarm parameters can be changed
   d. Who has the authority to set and/or change alarm parameters
   e. Who has the authority to set alarm parameters to “off”
   f. Monitoring and responding to alarms
   g. Checking individual alarms for accurate settings, proper operation, and detectability

6. As of January 1, 2016, hospitals must educate staff and licensed practitioners about the purpose and proper operation of alarms for which they are responsible.

E. **NPSG #7: Reduce the risk of healthcare-associated infections**

1. Comply with either the current Centers for Disease Control and Prevention (CDC) or the current World Health Organization (WHO) hand hygiene guidelines (NPSG.07.01.01).
   a. According to the CDC, millions of people acquire healthcare-associated infections each year.
   b. The CDC has determined that frequent handwashing is the single most important factor for preventing the spread of infections in healthcare settings.
   c. Healthcare organizations must implement a program following CDC or WHO hand hygiene guidelines that consists of developing policies, fostering a "culture of hand hygiene," monitoring compliance, setting goals for improving compliance, and improving compliance based on those goals.
   d. Nursing staff must utilize appropriate hand hygiene practices to reduce the transmission of pathogenic organisms to patients, personnel, and visitors.
   e. Hand hygiene may be done by either washing the hands with soap and water or cleansing the hands with an alcohol-based hand product.
   f. Guidelines developed by the CDC and infection control organizations recommend healthcare workers use an alcohol-based hand rub (a gel, rinse, or foam) to routinely clean their hands between each patient contact, unless hands are visibly soiled.
   g. Hands must be washed with soap and water in the following situations:
      - When hands are visibly soiled or contaminated with blood or body fluids
      - After direct contact with a patient who has (or handling items/substances contaminated with) *Bacillus anthracis* (anthrax) or *Norovirus*
      - After removing gloves if gloves are visibly soiled with blood or body fluids
      - After every 5-10 applications of alcohol-based hand sanitizer (as recommended by product manufacture)
      - After contact with blood, body fluids or excretions, mucous membranes, non-intact skin or wound dressings
      - After using the restroom
      - Before eating or preparing food and after eating

   **Note:** Follow facility-specific hand hygiene policies and protocols for patients with *Clostridium difficile* (C. diff).

   h. An alcohol-based hand sanitizer may be used instead of hand washing in the following situations:
      - Before starting your work
      - Prior to going into and after leaving a patient room if your work involves touching patient or anything in the room
• Before donning and after removing gloves
• Before and after having direct contact with patient’s intact skin (e.g., when taking a blood pressure or lifting a patient)
• During patient care when moving from contaminated body site to clean body site as long as hands are not visible soiled
• After contact with inanimate objects (equipment, bed, etc.) in patient’s immediate area
• Before leaving work

i. Hand hygiene techniques
• Hand washing
  ✓ Wet both hands with clean running water
  ✓ Apply adequate amount of soap in palm of hand
  ✓ Rub soap all over both hands, including wrists, between fingers and under fingernails
  ✓ Scrub for at least a full 15 seconds
  ✓ Rinse hands well under clean running water
  ✓ Dry hands completely using a clean paper towel
  ✓ Use another clean paper towel to turn off faucet
  ✓ **Do not** touch faucet/sink/counter
  ✓ **Do not** touch door knob with your clean, bare hands
  ✓ Use clean paper towel to open door
  ✓ Toss paper towel in the trash

• Alcohol-based hand sanitizers
  ✓ Apply **enough** alcohol-based hand sanitizer to open palm (to fully cover hands and wrists)
  ✓ Rub hands together palm to palm
  ✓ Rub in between and around fingers
  ✓ Rub back of each hand with palm of other hand
  ✓ Rub fingertips of each hand in opposite palm
  ✓ Rub each thumb clasped in opposite hand
  ✓ Rub each wrist clasped in opposite hand
  ✓ Keep rubbing hand surfaces until hands are **dry**

j. Fingernails/Rings
• Long nails, extenders, and artificial fingernails are not permitted for those who have direct contact with patients (touch patients as part of their care or service), handle instruments or patient care equipment, have contact with food or medications, or whose duties that are intended for patients (e.g., sterilization, dietary, product chain, laboratory, pharmacy, etc.).

• Natural nails must be clean and should extend no more than ¼ inch beyond the tip of the finger.

• Fingernail polish should be in good condition, free of chips, and preferably clear in color.

• Wearing rings with stones should be avoided because they can harbor bacteria and also tear gloves.
2. Implement evidence-based practices to prevent healthcare-associated infections due to multidrug-resistant organisms (MDROs) in acute care hospitals (NPSG.07.03.01).

   a. The purpose of this goal is to reduce the risk of or prevent healthcare-associated infections from multidrug-resistant organisms.
   b. MDROs include, but are not limited to, methicillin-resistant Staphylococcus aureus (MRSA), Clostridium difficile, vancomycin-resistant enterococci (VRE), and multidrug-resistant gram-negative bacteria.
   c. Healthcare organizations must develop and implement an infection control and surveillance program and evidence-based strategies to prevent healthcare-associated infections due to multidrug-resistant organisms in acute care hospitals. Hospitals must customize their strategies to address the risks associated with their patient population in order to minimize the incidence of healthcare-associated infections resulting from MDROs. Strategies to reduce the incidence of healthcare-associated infections from the transmission of MDROs should include hand hygiene, cleaning and disinfecting both patient care equipment and the environment, and contact precautions.
   d. Patients and families infected or colonized with multidrug-resistant organisms must be educated about healthcare-associated infection strategies.
   e. Information regarding infection control measures, such as hand and respiratory hygiene practices (e.g., cover your nose and mouth when coughing or sneezing), must be discussed with each patient or family on the day of admission or as soon as possible.
   f. When indicated by risk assessment, hospitals must also implement alert systems that identify new patients with MDROs and those patients known to be positive for MDROs who are readmitted or transferred.

3. Implement evidence-based practices to prevent central line-associated bloodstream infections (NPSG.07.04.01).

   a. This goal encompasses long- and short-term central venous catheters as well as peripherally inserted central catheter (PICC) lines.
   b. Healthcare providers must implement best practices or evidence-based guidelines to prevent central line-associated bloodstream infections. Leaders must conduct periodic hospital wide risk assessments in time frames defined by the hospital, monitor compliance with policies and procedures, and evaluate effectiveness of prevention efforts.
   c. Staff involved in managing central lines must be educated upon hire and annually on prevention of central line infections.
   d. Patients and family members must be educated on prevention of central line associated bloodstream infections prior to insertion.
   e. A standardized cart/kit containing all necessary equipment should be used for central line insertion.
   f. Nursing staff must:
      - Wash hands and don cap and mask before assisting with catheter insertion
      - Ensure sterile technique is maintained throughout catheter placement procedure and stop procedure if there is any question that sterility has been broken
      - Perform hand hygiene, don gloves, and scrub hub and sides of catheter port with an approved antiseptic agent prior to accessing port (e.g., for blood withdrawal or intravenous medication administration). Follow facility-specific policy regarding length of time required to scrub port
      - Use aseptic technique and vigorously scrub insertion site using back and forth strokes with chlorhexidine during central line dressing change. Follow manufacture’s recommendations regarding length of time required to scrub
      - For adult patients, catheters should not be inserted into the femoral vein unless other sites are unavailable
4. Implement evidence-based practices for preventing surgical site infections (NPSG.07.05.01).

   a. Hospitals must implement policies and practices that are evidence-based and meet regulatory requirements for reducing the risk of surgical site infections. An infection is considered to be a surgical site infection when it occurs at the site of surgery within 30 days of an operation or within 90 days of an operation if a foreign body (e.g., an artificial heart valve) is implanted as part of the surgery.

   b. Staff involved in surgical procedures must be educated about surgical site infections and the importance of prevention upon hire, annually, and when involvement in surgical procedures is added to their job responsibilities.

   c. Patients undergoing a surgical procedure and families, as needed, should be educated on prevention of surgical site infections (e.g., hand hygiene).

   d. Nursing staff must wash hands with soap and water or alcohol-based hand sanitizers before and after caring for patient.

   e. Hospitals should use methods supported by research findings or professional organizations for hair removal prior to surgery.

   f. Antibiotics should be administered for prophylaxis based on research findings or approval by professional organizations.

   g. Hospitals must conduct periodic risk assessments for surgical site infections, select surgical site infection measures using evidence-based guidelines or best practices, monitor compliance, and evaluate effectiveness of prevention efforts. Surgical site infection rates must be monitored for 30-90 days following surgical procedures.

5. Implement evidence-based practices to prevent indwelling catheter-associated urinary tract infections (CAUTIs) (NPSG.07.06.01)

   a. In January 1, 2013, hospitals were required to implement a plan to prevent CAUTIs based on evidence-based practices.

   b. Hospitals must use evidence-based practice to determine and limit the frequency and duration of indwelling urinary catheter insertion to those times when necessary to optimize patient care. Aseptic technique should be used when preparing the site, equipment, and supplies.

   c. Hospitals must use evidence-based guidelines in the management of urinary catheters. Practices should address securing catheter to maintain unobstructed urinary drainage, ensuring urine collection system remains sterile and is replaced when needed, and urine samples are collected per established guidelines.

   d. Best practice guidelines should be used to monitor the effectiveness of the hospital’s CAUTI prevention plan. These include determining measurement criteria, monitoring compliance, and evaluating effectiveness in reducing CAUTIs.

   e. Educate staff and licensed independent practitioners involved in the use of indwelling urinary catheters about CAUTI and the importance of infection prevention. Education occurs upon hire or granting of initial privileges, and when involvement in indwelling catheter care is added to an individual’s job responsibilities. Ongoing education and competence assessment occur at intervals established by the organization.

   f. Educate patients who will have an indwelling catheter, and their families as needed, on CAUTI prevention and the symptoms of a urinary tract infection.

   g. Develop written criteria, using established evidence based guidelines, for placement of an indwelling urinary catheter. Written criteria are revised as scientific evidence changes.

   **Note:** Examples of criteria for placement of an indwelling urinary catheter include the following:
   - Critically ill patients who need accurate urinary output measurements
   - Patients with acute urinary retention or bladder outlet obstruction
• Patients who require prolonged immobilization (for example, a potentially unstable thoracic or lumbar spine or multiple traumatic injuries such as pelvic fractures)
• Incontinent patients with an open sacral or perineal wounds
• Perioperative use for selected surgical procedures, such as patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract; patients who will have a prolonged duration of surgery (catheters inserted for this reason should be removed in a post-anesthesia care unit); patients anticipated to receive large volume infusions or diuretics during surgery; patients needing intraoperative monitoring of urinary output
• End-of-life care
• Neurogenic bladder

h. Follow written procedures based on established evidence-based guidelines for inserting and maintaining an indwelling urinary catheter. The procedures address the following:

• Limiting use and duration
• Performing hand hygiene prior to catheter insertion or maintenance care
• Using aseptic techniques for site preparation, equipment, and supplies
• Securing catheters for unobstructed urine flow and drainage
• Maintaining the sterility of the urine collection system
• Replacing the urine collection system when required
• Collecting urine samples

Note: There are medical conditions that require prolonged use of an indwelling urinary catheter in order to avoid adverse events and promote patient safety. Examples can include, but are not limited to, patients with a spinal cord injury, multiple sclerosis, Parkinson’s disease, and spina bifida.

i. Measure and monitor catheter-associated urinary tract infection prevention processes and outcomes in high volume areas by doing the following:

• Selecting measures using evidence-based guidelines or best practices
• Having a consistent method for medical record documentation of indwelling urinary catheter use, insertion, and maintenance
• Monitoring compliance with evidence-based guidelines or best practices
• Evaluating the effectiveness of prevention efforts

Note: Surveillance may be targeted to areas with a high volume of patients using indwelling catheters. High volume areas are identified through the hospital’s risk assessment.

F. NPSG #15: The organization identifies safety risks inherent in its patient population

1. Identify individuals at risk for suicide (NPSG.15.01.01).

   a. Suicide is a national healthcare crisis. Nearly 650,000 emergency department admissions are reported each year for suicide-related injuries. In addition, 30,000 people in the United States and one million worldwide die from suicide, with one person dying every 13.7 seconds (American Foundation for Suicide Prevention (AFSP, 2012). Shockingly, suicide among hospitalized patients is the most common sentinel event reported to The Joint Commission. Identifying patients in danger of committing suicide during hospitalization or after discharge is a vital step in protecting and planning care for these patients.
b. All suicide threats should be considered serious, especially if the patient verbalizes specific plans, methods, place, and time.

c. A structured evidence-based patient and environmental screening process for emergency departments, outpatient clinics, and hospitals must be developed, implemented, and evaluated. Hospitals should provide education/supervision/support for staff involved in the screening process.

d. Suicide risk assessments should be conducted on a routine basis, with a change in status or diagnosis, and prior to discharge. In addition, a reassessment should also be performed when a patient experiences a devastating life event, such as the death of a loved one, a new chronic or terminal diagnosis, divorce, or job loss.

e. Risk assessments must include identification of specific factors, such as patient characteristics and environmental features that may increase or decrease the risk for suicide.

f. Suicide Risk Assessment
   - Hospitals should consider using a standardized tool for assessing suicide risk throughout the healthcare setting. Hospitals may adopt a tool developed by the psychiatric community or created by the organization using evidence-based practice.
   - Because there are degrees of suicide risk rather than a “yes or no” finding, the tool should provide healthcare practitioners with a numerical score that reflects the likelihood the patient will attempt suicide.
   - Four variables should be assessed, including thoughts, plan, means, and ability. The level of care needed to ensure patient safety should be determined by the patient’s progression through these four variables (i.e., some patients may have thoughts of suicide, but no specific plan, while others may have a plan but not the means or ability). The risk assessment should be evaluated by a multi-disciplinary team to determine level of supervision and documentation needed and most appropriate setting for treatment.
   - With the patient’s consent, healthcare providers may use information provided by family members when determining patient’s risk of suicide.
   - Healthcare providers must also understand that environmental risks must be assessed, not just in high risk areas, such as psychiatric units, but in all areas of the hospital. Therefore, if a patient is identified as a high suicide risk, the physical environment, including the patient’s room, restroom, group rooms, should be evaluated.

g. Implementation of Suicide Prevention Treatment Plan
   - When a patient has been identified as a high suicide risk based on assessment criteria, healthcare providers should develop and implement a treatment plan that includes identified needs, indicators of progress, and interventions.
   - The level of observation (e.g., 1:1, close observation) should be determined and the effectiveness of their implementation routinely evaluated.
   - Nursing staff responsibilities
     ✓ Assess for and immediately notify primary physician of any newly identified suicide risks, thoughts, ideations, and previous attempts expressed by the patient
     ✓ Use open-ended, focused questions when conducting a suicide risk assessment. Ask direct and concise questions, such as “Are you having thoughts of harming yourself?”
     ✓ Ensure patient is in view of nursing staff at all times
✓ Remove potentially harmful objects, (e.g., aerosolized sprays, medications, matches, plastic bags, belts, sharps, cords, glass, straps) from patient's belongings and room (unless currently needed, e.g., oxygen and suction tubing)
✓ Follow facility-specific policy if patient elopes from area
✓ Assist patient to identify and develop alternative coping strategies
✓ Obtain verbal contract from patient that includes an agreement not to harm self or leave ward unescorted and to inform staff when suicidal feelings occur

h. Discharge Instructions

- Provide clear and concise discharge instructions, particularly related to medications and follow-up appointments.
- Ensure patient understands follow-up clinic visits, location, and importance.
- Provide patient and family with resource numbers prior to discharge, which may include the following:
  ✓ National Hotline number: 1-800-273-TALK (8255)
  ✓ Suicide Prevention Centre 24-hour Access Hotline Number: 1-877-7CRISIS (27-4747)
  ✓ Department of Mental Health 24-hour Access Hotline Number: 1-800-845-7771
  ✓ Call 911 if suicide risk is imminent
  ✓ 211 is a general countywide number that provides information on a variety of resources.

IV. Universal Protocol

The Universal Protocol is intended to prevent wrong site, wrong procedure, and wrong person procedures by conducting pre-procedure verification, marking operative sites, and performing a "time-out" for all surgical and non-surgical invasive procedures. These three components do not necessarily need to be completed in order; however, a final verification during the “time-out” process must follow the pre-procedure verification and the site marking (The Joint Commission, 2013, 2014).

While patients receiving general anesthesia or deep sedation are most at risk, other procedures may also put the patient at risk. Effective implementation of the Universal Protocol involves consistent use of multiple strategies, open communication, and active involvement by the healthcare team and patient and family, when possible. This is best achieved in hospitals where teamwork is valued and all healthcare providers are empowered to take an active role in promoting patient safety. Nurses have an obligation to speak up when any portion of the Universal Protocol is not followed.

A. Conducting a pre-procedure verification process

1. The pre-procedure verification process is designed to ensure all relevant documents (consent, history and physical, etc.), studies/diagnostic results, and implants/devices are available and have been reviewed prior to the start of the procedure. The healthcare team’s understanding of the intended patient, procedure, site, and patient’s perceptions should be included in the verification process.

2. Pre-procedure verification is an ongoing process of information gathering and verification that may occur at various times and in various places prior to the procedure. Pre-procedure verification begins with the decision to do the procedure and continues through all settings and interventions involved in the preoperative preparation, up to and including the "time-out" just before the start of the procedure.
3. Missing information or discrepancies must be addressed before starting the procedure.

4. This process must be documented on a pre-procedure checklist.

5. How often and to what extent the pre-procedure verification is done depends on the type of procedure. Although each hospital decides who collects the information and when it is collected, efforts should be made to do this at a time when the patient can participate.

B. Marking the procedure site

1. According to The Joint Commission (2013), site marking is a method of communicating to the team about the patient involved in the procedure. Marking the procedure site is an important strategy for ensuring patient safety during invasive procedures. A consistent approach should be used throughout the hospital for site marking. The operative site must be marked to clearly identify the intended site of incision or insertion. If at all possible, the patient should be involved during the marking of the procedure site. The Joint Commission recommends that the healthcare provider who knows the most about the patient and intended procedure should mark the site. Although this is typically the individual performing the procedure, the task may be delegated to the following:

   • Individuals authorized through a postgraduate education program to participate in the procedure
   • A licensed practitioner, such as an advanced practice registered nurse (APRN) or physician’s assistant (PA), who performs duties requiring collaborative or supervisory agreements with a licensed independent practitioner
   • The licensed independent practitioner remains fully accountable for all aspects of the procedure even when site marking is delegated. (The Joint Commission, 2013)

2. For procedures involving right/left distinction, multiple digits (such as fingers and toes), or multiple levels (as in spinal procedures), the intended site must be marked so the mark will be visible after the patient has been prepped and draped.

C. Performing a Time-out

1. A "time-out" is a final verification of the correct patient, procedure, site, and implants (as applicable). Ideally, the time-out should be conducted prior to administering anesthesia so that the patient can participate. An additional time-out may be conducted.

2. In order to ensure active communication among all members of the surgical/procedure team, a "time-out" is conducted in a "fail-safe" mode, i.e., the procedure is not started until any questions or concerns are resolved. In addition, if possible, all activities should be halted during the time-out to enable all participants to confirm the correct patient, site, and procedure.

3. Although a designated team member initiates the time-out, all healthcare team members involved in the procedure must be part of the “time-out” and may not perform other duties during the “time-out” procedure.

4. The "time-out" procedure should be performed and documented consistently according to institutional policy.

Note: The Department of Health Services (DHS) is in the process of adopting a system wide “Time Out” process entitled “ASK NICE.” Online and live training will be provided at each of the DHS facilities.
IV. Conclusion

The National Patient Safety Goals (NPSGs) were implemented in 2003 to reduce the risk of adverse events and improve patient safety. While there are no new NPSGs for 2017, NPSG.07.06.01: Implement evidence-based practices to prevent indwelling catheter-associated urinary tract infections has been expanded to include education of staff, licensed independent practitioners, and patients/families regarding the use of indwelling catheters and the importance of infection prevention. The Universal Protocol is a critically important component of the NSPGs that is designed to ensure patient safety by preventing wrong site, wrong procedure, and wrong person procedures. The universal protocol includes pre-procedure verification, marking operative sites, and performing "time-outs" for all surgical and non-surgical invasive procedures. Effective implementation of the Universal Protocol involves consistent use of multiple strategies, open communication, and active involvement by the healthcare team and patient and family. There are many strategies that hospitals may use to achieve all of the NPSGs. Nursing staff plays a critical role in implementing these strategies in order to promote patient safety and optimize patient outcomes.

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
Select the best answer to each question.

1. Which of the following is a **TRUE** statement regarding the prevention of catheter-associated urinary tract infections (CAUTI) (NPSG.07.06.01)?
   a. Staff and patients should be educated on CAUTI prevention
   b. Indwelling bladder catheters should never be used in the inpatient setting
   c. Indwelling bladder catheters should be used for all incontinent patients
   d. Clean technique should be used during insertion of indwelling bladder catheters

2. In order to comply with NPSG #7: Reduce the risk of healthcare-associated infections, hospitals should implement evidence-based practices to prevent which of the following:
   a. Central line-associated infections
   b. Indwelling catheter-associated urinary tract infections
   c. Surgical site infections
   d. All of the above

3. Which of the following is a **TRUE** statement regarding the safety of clinical alarms (NPSG.06.01.01)?
   a. Alarms should always be set as widely as possible
   b. Noise from alarms may cause staff to become desensitized to them
   c. As many devices with alarms as possible should be used to cover all bases
   d. Clinical alarms should be turned as low as possible so as not to disturb the patient

4. Which of the following is a **TRUE** statement about the Universal Protocol?
   a. A pre-procedure verification should be conducted three times prior to the procedure
   b. Missing information or discrepancies must be addressed before starting the procedure
   c. The intent of the Universal Protocol is to prevent wrong medication administration prior to surgery
   d. The purpose of a “time out” is to allow the healthcare team to take a break prior to lengthy procedures

5. What are the components of the Universal Protocol?
   a. Conducting a pre-procedure verification
   b. Performing a time-out
   c. Marking the site
   d. All of the above

**Answers to Study Questions**


If you answered all of the questions correctly, go on to the next section. If you missed one or more, read the content again and repeat the study guide questions.
EVENT AND NEAR MISS NOTIFICATION
USING THE SAFETY INTELLIGENCE REPORTING SYSTEM

Objectives:

Upon completion of this section, the workforce member will be able to:

1. Describe the historical background of event and near miss reporting in healthcare
2. Recognize the benefits of event notification and early reporting
3. Identify barriers to event and near miss reporting
4. Identify the types of events to be reported including sentinel events
5. Describe the event notification reporting procedure

I. Historical Background of Event and Near Miss Notification

Across the nation, there has been a continuous effort to promote a culture of safety throughout the healthcare system. A number of historical events led to this growing focus on patient safety.

A. The Institute of Medicine (IOM) released a groundbreaking report in 1999, “To Err is Human: Building a Safer Health System”, that identified as many as 98,000 patients die in hospitals each year in the United States because of medical errors. These errors have resulted in hospital costs ranging between 17 billion to 29 billion dollars per year.

B. The IOM report also identified strategies for improvement which included developing a mandatory nationwide public reporting system to identify, report, and learn from errors.

C. Congress enacted the Patient Safety and Quality Improvement Act of 2005 which led to a more structured process and improve transparency of patient safety event reporting. This Act also ensured privacy and security to prevent legal repercussions for information reported by providers.

D. There are mandated reporting categories as defined by The Joint Commission, California Health and Safety Codes and the Centers for Medicare and Medicaid Services (CMS). It allows for the analysis of events that can help facilities be safer places.

II. Definitions

A. **Event:** An occurrence that reaches a patient, visitor, staff member or an unsafe condition that caused any degree of harm.

B. **Near Miss:** An incident or unsafe condition that has the potential for injury or property damage where harm to the patient, visitor, or staff member was avoided.

C. **Sentinel Event:** An unexpected occurrence involving death or serious physical injury or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function.

D. **Reportable Events:** Events requiring mandated reporting as defined in Health and Safety Code Section 1279.1, as well as Title 22, California Code of Regulations, Section 70737 (the “unusual occurrence” reporting requirement.), also known as “Never 28”.
III. Benefits of Event and Near Miss Reporting

Reporting sets up a method so that errors and near misses can be communicated to key participants.

- Helps prevent future similar and even more serious errors
- Allows for healthcare agencies to evaluate, revise, and create practices to decrease the risk of error
- Enables organizations to implement plans to improve the overall patient safety system including investing in staff education and budget allocation
- Promotes trust and loyalty in the healthcare provider-patient relationship

IV. Barriers to Reporting

Many errors are not reported by healthcare providers for a number of reasons. Some of the reasons are due to the burden of reporting (“I don’t have the time,” “I forgot,” “I can’t use the computer”); unsure whether the incident needs to be reported or whether it is the employee’s job to report (someone else will do it); error not considered serious enough to report; or fear of punishment, retaliation for reporting or being blamed for the incident.

Workforce members will not be punished or retaliated against for reporting an error, near miss, adverse event, or safety or quality concerns in good faith. Reporting errors can be an opportunity for the organization to learn and improve upon the delivery of care. The main focus of reporting is to promote safe and quality patient care.

V. Types of Events to be reported

An Event Notification Report shall be submitted to report incidents that may include but are not limited to:

A. Sentinel Events which are subject to review by The Joint Commission (Table # 1)
B. Reportable Events, also known as “Never 28” (Table #2)
C. Patient visitor, non-county employee, or volunteer sustains an injury or near miss which has the potential for injury
D. A patient or relative seems dissatisfied or unhappy about the treatment or results of a treatment provided
E. An unforeseen result occurs whether or not the treatment has been proper or improper
F. A critical care or very high risk patient is transferred from a community hospital to a County facility; or any transfer that is considered detrimental to the patient’s recovery
Table 1: The Joint Commission Sentinel Events

<table>
<thead>
<tr>
<th>Event</th>
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<tbody>
<tr>
<td>Suicide of any patient receiving care, treatment, and services in a</td>
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<tr>
<td>staffed around-the-clock care setting or within 72 hours of discharge,</td>
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<td>including from the hospital's emergency department (ED)</td>
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<td>Unanticipated death of a full-term infant</td>
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<tr>
<td>Discharge of an infant to the wrong family</td>
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<tr>
<td>Abduction of any patient receiving care, treatment, and services</td>
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<tr>
<td>Any elopement (that is, unauthorized departure) of a patient from a</td>
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<tr>
<td>staffed around-the-clock care setting (including the ED), leading to</td>
</tr>
<tr>
<td>death, permanent harm, or severe temporary harm to the patient</td>
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<tr>
<td>Hemolytic transfusion reaction involving administration of blood or</td>
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<td>blood products having major blood group incompatibilities (ABO, Rh,</td>
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<tr>
<td>other blood groups)</td>
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<tr>
<td>Rape, assault (leading to death, permanent harm, or severe temporary</td>
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<tr>
<td>harm), or homicide of any patient receiving care, treatment, and</td>
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<tr>
<td>services while on site at the hospital</td>
</tr>
<tr>
<td>Rape, assault (leading to death, permanent harm, or severe temporary</td>
</tr>
<tr>
<td>harm), or homicide of a staff member, licensed independent practitioner,</td>
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<tr>
<td>visitor, or vendor while on site at the hospital</td>
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<tr>
<td>Invasive procedure, including surgery, on the wrong patient, at the</td>
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<tr>
<td>wrong site, or that is the wrong (unintended) procedure</td>
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<tr>
<td>Unintended retention of a foreign object in a patient after an invasive</td>
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<tr>
<td>procedure, including surgery</td>
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<tr>
<td>Severe neonatal hyper-bilirubinemia (bilirubin &gt;30 milligrams/deciliter)</td>
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<tr>
<td>Prolonged fluoroscopy with cumulative dose &gt;1,500 rads to a single</td>
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<tr>
<td>field or any delivery of radiotherapy to the wrong body region or &gt;25%</td>
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<tr>
<td>above the planned radiotherapy dose</td>
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<tr>
<td>Fire, flame, or unanticipated smoke, heat, or flashes occurring</td>
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<tr>
<td>during an episode of patient care</td>
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<tr>
<td>Any intrapartum (related to the birth process) maternal death</td>
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<tr>
<td>Severe maternal morbidity when it (not primarily related to the</td>
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<tr>
<td>natural course of the patient's illness or underlying condition)</td>
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<tr>
<td>reaches a patient and results in any of the following:</td>
</tr>
<tr>
<td>Permanent harm or severe temporary harm</td>
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Comprehensive Accreditation Manual for Hospitals www.jointcommission.org

Event Notifications are privileged and confidential information. The reports should never be referenced in the patient's medical record, printed or copied.
Table 2: Reportable Events: “Never 28”

<table>
<thead>
<tr>
<th>Surgical events</th>
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<tbody>
<tr>
<td>1. Wrong body part/organ (inconsistent with documented informed consent)</td>
</tr>
<tr>
<td>2. Wrong patient</td>
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<td>3. Wrong procedure (inconsistent with documented informed consent)</td>
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<td>4. Retained foreign object, excluding those purposefully retained.</td>
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<td>5. <strong>Unexpected</strong> death after or within 24 hours of induction of anesthesia in healthy patient</td>
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</tbody>
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<thead>
<tr>
<th>Product or device events</th>
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<tbody>
<tr>
<td>6. Death/serious disability from a contaminated drug/device or biologic</td>
</tr>
<tr>
<td>7. Death/serious disability associated with use/function of device in a way other than as intended</td>
</tr>
<tr>
<td>8. Death/serious disability associated with intravascular air embolism</td>
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<tr>
<th>Patient protection events</th>
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<tbody>
<tr>
<td>9. Infant discharged to wrong person</td>
</tr>
<tr>
<td>10. Death/serious disability associated with patient disappearance for more than 4 hours (excludes adults with capacity)</td>
</tr>
<tr>
<td>11. Patient suicide or attempted suicide resulting in serious disability that occurs within facility</td>
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<table>
<thead>
<tr>
<th>Case management events</th>
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</thead>
<tbody>
<tr>
<td>12. Death/serious disability associated with medication error</td>
</tr>
<tr>
<td>13. Death/serious disability associate with administration of ABO-incompatible blood or blood products</td>
</tr>
<tr>
<td>14. Maternal death/serious disability associated with labor or delivery in a low-risk pregnancy</td>
</tr>
<tr>
<td>15. Death/serious disability related to hypoglycemia onset in hospital</td>
</tr>
<tr>
<td>16. Death/serious disability with failure to identify and treat hyperbilirubinemia in neonates during first 28 days of life</td>
</tr>
<tr>
<td>17. Stage 3 and 4 ulcers acquired after admission</td>
</tr>
<tr>
<td>18. Death/serious disability from spinal manipulation at hospital</td>
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<table>
<thead>
<tr>
<th>Environmental events</th>
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</thead>
<tbody>
<tr>
<td>19. Death/serious disability associated with electrical shock</td>
</tr>
<tr>
<td>20. Oxygen lines or other gas lines have the wrong gas or are contaminated by toxic substances</td>
</tr>
<tr>
<td>21. Death/serious disability associated with burn in facility</td>
</tr>
<tr>
<td>22. Death associated with fall in facility</td>
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<tr>
<td>23. Death/serious disability associated with restraints/bedrails</td>
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<tr>
<th>Criminal events</th>
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<tbody>
<tr>
<td>24. Care ordered/provided by someone impersonating licensed health care provider</td>
</tr>
<tr>
<td>26. Sexual assault/rape of patient</td>
</tr>
<tr>
<td>27. Death or significant injury of patient, staff resulting from physical assault.</td>
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<table>
<thead>
<tr>
<th>Major permanent loss of function (disability) associated with:</th>
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</thead>
<tbody>
<tr>
<td>28. Neurological Deficit not present at time of admission including coma, paralysis, nerve damage, blindness, related or unrelated to medical or surgical procedures; Med Error/ADR; Healthcare Acquired Infection; Birth Trauma; Unanticipated medical/surgical complication; Birth/brain injury unrelated to congenital condition; or Attempted Suicide resulting in serious disability</td>
</tr>
</tbody>
</table>

*Office of Risk Management, LAC-USC*
VI. Reporting an Event or Near Miss

Workforce members are responsible for reporting near misses, adverse events, errors, and system flaws to their facility or DHS in a timely manner. Workforce members are encouraged to report these conditions by way of the Safety Intelligence (SI) online reporting system.

The Safety Intelligence system (SI) is used by the Los Angeles County Department of Health Services to collect and analyze data on the quality and safety of healthcare delivery. Event notifications are entered into the SI system and can be anonymous. Important key points in reporting include:

- Immediately address the needs of the patient when an event occurs
- Staff must notify his/her immediate supervisor
- Event notification reports should be entered by the end of the shift of occurrence or by the end of shift of discovery
- Follow facility specific policy of additional reporting processes or forms
- All events shall be reported even if only partial statements of fact are available at the time the report is entered
- The completed report will be forwarded to the appropriate personnel for review and follow-up including the manager/supervisor, risk management and administrators

Further, any workforce member who has concerns about the safety or quality of care provided in any DHS hospital or healthcare facility may also report the conditions to:

Office of Quality and Patient Safety
The Joint Commission
One Renaissance Blvd.
Oakbrook Terrace, Illinois 60181
Fax: (630) 729-5636
patientsafetyreport@jointcommission.org
Online: http://www.jointcommission.org/report_a_complaint.aspx

VII. Conclusion

When errors are concealed, patients are at higher risk of experiencing some type of harm. It is important for everyone in healthcare to realize how crucial error reporting is, including near misses, in patient safety. Promoting a safe and just culture and eliminating blame prevents underreporting of errors. A blame-free approach to reporting results in positive action, opportunities for systems improvements and improved communication among healthcare team members for a safer healthcare system.

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
EVENT AND NEAR MISS NOTIFICATION
USING THE SAFETY INTELLIGENCE REPORTING SYSTEM

Study Questions

Select the best answer to each question.

1. The benefits of event and near miss reporting include:
   a. Helps identify who was at fault
   b. Provides proof for the facility to punish the staff at fault
   c. Provides information for organizations to sue for malpractice
   d. Promotes trust and loyalty in the healthcare provider-patient relationship

2. When a reportable event occurs, the staff must:
   a. Pretend the event did not happen
   b. Hide evidence that the event occurred
   c. Ensure the needs of the patient are met and notify the supervisor
   d. Refuse to write an event report in the Safety Intelligence System

3. Types of events reported in the Safety Intelligence system include:
   a. Sentinel Events
   b. Near miss events
   c. An unforeseen result occurs whether or not the treatment has been proper or improper
   d. All of the above

Answers to Study Questions

1. D  2. C  3. D

If you answered all of the questions correctly, go on to the next section. If you missed one or more, read the content again and repeat the study guide questions.
HAND OFF COMMUNICATION

Objectives:

Upon completion of this section, the workforce member will be able to:

1. Describe the importance of effective communication
2. Identify three situations when hand off communication is required
3. List the components of effective hand off communication

I. Introduction

Communication is one of the most effective tools caregivers can use to ensure patient safety. Not only can effective communication decrease errors, but it can also improve the quality of services provided and decrease cost. In order to be effective, communication must be clear, timely, thorough, and accurate. Effective communication also requires that the message delivered is understood by the receiver. In order for the message to be interpreted correctly, communication between the sender and receiver should be interactive and ideally involve validation of the message being sent. This may include repeating important information and allowing time for questions (The Joint Commission, 2013).

Hand off communication is a means of delivering important patient care information that helps promote continuity of care and patient safety (The Joint Commission, 2013). Strategies for effectively using this tool are discussed in the following section.

II. Hand off communication

A. Communication problems have been shown to be the major cause of sentinel events. Hand off communication is a high risk process that involves passing on pertinent information about patients from one caregiver to another. Incomplete or inaccurate hand off communication may lead to errors, such as missed or inappropriate treatments or procedures (The Joint Commission, 2013).

B. Hand off communication helps to build a cohesive healthcare team, enhances planning and delivery of safe patient care, and improves patient outcomes.

C. In the inpatient setting, hand off communication should occur during nursing shift changes, temporary coverage during breaks, internal and external transfers, and transfers to diagnostic test areas.

D. The Joint Commission (2014) recommends the following strategies to ensure effective and efficient hand off communication between caregivers:

1. Use clear language, avoid confusing or vague descriptions, and define the terms you are using.
   • Instead of saying, “She is getting worse,” it would be better to say “Her blood pressure has dropped to 90/50 from a baseline of 120/80; her pulse is up to 120 from 85.”

2. Use effective communication techniques, such as minimizing interruptions, focusing on information being conveyed, and allowing sufficient time for hand off communication.

3. Validate information to ensure mutual understanding of patient’s condition and expectations for care.
4. Encourage person receiving report to ask questions if information is unclear or inconsistent.

5. Standardize the method of hand off communication on each unit. A systematic process improves accuracy, completeness, and retention of information. Use tools to enhance organization of information to ensure report is concise, but thorough.
   - It is recommended that RNs utilize SBAR (if available) in ORCHID to guide hand off report.

E. The components of a hand off communication report vary between healthcare institutions, but in general include the following:
   - Patient’s name
   - Patient’s physician/provider
   - Allergies
   - Diagnosis or problem list or reason for hospitalization
   - Current vital signs
   - Current condition of the patient and/or any recent change
   - Pain score and most recent pain medication given
   - Latest treatments and procedures
   - Pending treatments, procedures, or laboratory tests
   - Equipment or supplies needed for patient care
   - Additional information, such as holds or isolation precautions
   - Patient safety issues, such as falls, pressure injuries, suicide risk, potential for violence, elopement risk, and seizure risk

Refer to facility-specific policies for additional setting/specialty-specific hand off requirements.

III. Conclusion

Effective communication is vital to optimizing the quality and safety of patient care delivery as well as reducing costs associated with avoidable errors. Effective communication is an active process that should involve participation by both the sender and receiver to ensure the message is accurate and complete. Hand off communication is a high risk process that involves passing on pertinent information about patients from one caregiver to another that, when conducted properly, promotes continuity of care and patient safety.

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
HAND OFF COMMUNICATION
Study Questions

Select the best answer to each question.

1. Which of the following components are typically included in a hand off communication report?
   a. Next of kin
   b. Allergies
   c. Smoking history
   d. Previous admissions

2. Hand off communication should occur in which of the following situations?
   a. During shift change
   b. When the patient goes to the restroom
   c. When the nurse leaves the patient’s room to check on another patient
   d. All of the above

Answers to Study Questions

1. B  2. A

If you answered all of the questions correctly, go on to the next section. If you missed one or more, read the content again and repeat the study guide questions.
SAFE PATIENT HANDLING

Objectives:

Upon completion of this section, the workforce member will be able to:

1. Know the regulations related to safe patient handling (SPH)
2. Recognize the benefits of using safe patient handling equipment
3. Identify the recommended weight limit for patient lifting tasks according to the National Institute for Occupational Safety and Health (NIOSH)
4. Recognize patient handling tasks that have a high risk of injury to bones and muscles for healthcare workers
5. Recognize primary principles that should be used when moving patients

I. Introduction

It is a well-established fact that healthcare workers face a higher risk than other workers of developing painful injuries that affect muscles, tendons, nerves or other soft tissues. A large number of healthcare workers are suffering preventable back, shoulder and neck injuries from manual patient handling. Workers and their managers often are not aware that these potentially career-ending injuries commonly occur after years of repetitive strain rather than one event.

The greatest risk factors for injuries of this type for healthcare workers are:

- Manual lifting of patients
- Repositioning patients
- Moving patients

The best way for preventing back injuries in healthcare is to stop manual lifting by making full use of power lifting equipment.

II. Safe Patient Handling Law

In California, Cal/OSHA AB 1136, Hospital Patient and Health Care Worker Injury Protection Act Safe Patient Handling (SPH) regulation took effect on October 1, 2014. This law requires that acute care hospitals include in their Injury and Illness Prevention Program:

- A Patient protection and health care worker Musculoskeletal Injury Prevention Plan (MIPP), which is a plan to keep health care workers free from injury
- That includes a safe patient handling policy (available through your facilities Safety Officer)
- A safe handling policy for all patient care units
- RN observation/direction of patient lifts and movement (can be delegated to qualified staff per the Nurse Practice Act)
- Use of powered patient transfer devices, lifting devices, and lift teams as appropriate for the patient and clinical assessment in place of manual lifting and transferring of patients
- No disciplinary action will be taken against a healthcare worker for refusal to lift, reposition or transfer a patient due to concerns about patient or worker safety or the lack of trained team personnel or equipment
III. Risks for Injury

A. The National Institute for Occupational Safety and Health (NIOSH) recommends “a weight limit for patient lifting tasks of 35 pounds under ideal conditions.” The weight limit is decreased if the lifting is performed in an awkward position, such as lifting a patient in a limited space (i.e., bathroom) or lifting a patient from the floor (Waters, 2007). When the weight to be lifted exceeds 35 pounds, assistive devices (SPH equipment) should be used.

B. The high physical demands with handling and moving patients—who are getting heavier as obesity rates in the United States climb—are probably the largest contributing factors to high rates of injuries to nurses.

C. Injuries to bones and muscles are caused by lifting excessive loads and by the total effect of repeated high-risk patient handling tasks over time. This creates stress on the healthcare provider’s spine, shoulders, hands, and wrists (Mayeda-Letourneau, 2014). It is very important to recognize and manage these injuries early (Cal/OSHA 2014).

D. Manual patient lifting is done at high risk to the patient and the caregiver. The areas of body exposure and types of injuries associated with manual patient handling activities include risks associated with vertical and lateral movement, bariatric patients, repositioning and ambulation (Cal/OSHA).

E. “Using mechanical lifting equipment and transfer devices for patient handling significantly reduces injuries among direct patient caregivers” (ANA 2011). In addition, the use of trained SPH teams further reduces the likelihood of injury.

F. Using body mechanics alone does not give caregivers the skills to handle heavy loads (greater than 35 pounds).

G. High risk patient handling tasks include (but are not limited to):

- Transferring from bed to chair
- Transferring from bed to gurney
- Moving occupied bed or gurney
- Making an occupied bed
- Bathing a confused or totally dependent patient
- Lifting a patient up from the floor
- Weighing a patient
- Applying anti-embolism stockings
- Repositioning in bed
- Performing large dressing changes
- Applying restraints

H. Patient risk factors that must be reviewed during lateral transfers, repositioning, ambulation and movement:

- Ability and willingness to cooperate
- Bariatric status
- Clinical condition

IV. Handling and Movement Requirements

A. Avoid high-risk manual patient handling and movement tasks whenever possible. If you cannot avoid it, check the patient and the task carefully prior to beginning.
B. Use approved patient handling equipment and aids for high-risk patient handling and movement tasks (unless SPH equipment is not available in a medical emergency).

C. Use proper patient handling equipment and aids according to the manufacturer instructions, recommendations, training guidelines, and facility protocol.

V. Key Assessments/Checks Prior To Patient Movement

A. Assess/check the patient’s ability to assist due to fatigue, medications, sedation, pain, mental status change, etc., prior to moving the patient.

B. Assess/check patient’s ability to transfer on an ongoing basis since the amount of help they need may change. Increased level of assistance may be required if the patient has a change in status.

Assessment/check should include:

- Ability to assist
- Height and weight
- Weight-bearing capability
- Bilateral upper-extremity strength
- Patient’s level of cooperation and comprehension
- Special conditions affecting transfers/repositioning (e.g., tubes, spasms, wounds, surgical sites, contractures)
- Specific physician orders or therapy recommendations related to transferring and repositioning the patient (e.g., a patient with hip or knee replacement may have orders for specific hip angle or knee flexion during transfer (Nelson, et al. 2009).

*When in doubt about the patient’s ability to transfer, assume the patient cannot assist with the transfer/repositioning.*

VI. Role of the RN, trained Lift/Transfer/SPH Team and Supervisor

A. When a patient lift team is needed to assist with the lift or movement of a patient, the RN assigned to the patient is responsible for assessing the patient and for coordinating and overseeing the patient lift team.

B. Lift team members should contact the RN prior to patient movement/handling for specific guidelines regarding move/transfer.

C. Supervisors need to be familiar with the facility’s MIPP, SPH policy, and the patient handling hazards in their units

VII. Patient Movement/Handling Planning

A. Know how equipment works and where it is stored

B. Check the patient’s mobility needs and environment to see what type of SPH equipment is necessary

C. Gather equipment and other appropriate staff members if needed.

D. Organize the room and equipment for safe movement/transfers of the patient
• Make sure equipment is charged
• Lock the wheels of the bed and chair
• Put the bed or gurney at the correct height (hip level when moving a patient)
• Remove clutter and items that could be in the way of the transfer
• Place non-skid footwear on the patient
• Make sure SPH equipment (sling, straps, repo sheet) are correctly applied

E. Make sure all team members know their role and discuss the plan

F. Position yourself using the principles of body mechanics (determine heaviness of load, maintain wide base support, hold objects as close to you as possible, etc.)

G. Communicate with the patient about the procedure and equipment
   • Tell the patient what actions you plan to do
   • Explain what you need them to do
   • Tell them where to place their hands (avoid holding onto caregiver)
   • Coach them as they move through the activity

H. Check specific physician orders or therapy recommendations related to transferring and positioning the patient (e.g., a patient with hip or knee replacement may have orders for specific hip angle or knee flexion during transfer) (Nelson, et al. 2009)

VIII. Report safe patient handling concerns to the appropriate supervisor/designated charge
   • SPH practices for specific patients
   • Equipment availability, condition, storage, and maintenance
   • Patient or worker safety in regards to patient handling activities

IX. Conclusion

In addition to the legal requirements, Safe Patient Handling benefits our patients, workforce members and our institution.

Remember to use SPH Equipment to prevent injuries.

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
SAFE PATIENT HANDLING
Study Guide Questions

Select the best answer to each question.

1. A Safe Patient Handling Law requires that hospitals use:
   a. Manual lifting alone to transfer patients
   b. Lift equipment for bariatric patients only
   c. Nursing Attendants to coordinate all patient lifts and transfers
   d. Powered patient transfer devices for patient lifts and transfers

2. Which of the following patient handling tasks places the caregiver at high risk for musculoskeletal injury?
   a. Lifting a patient up from the floor
   b. Performing large dressing changes
   c. Transferring patient from bed to gurney
   d. All of the above

3. A key assessment/check prior to moving a patient should include:
   a. Dietary intake
   b. Allergy to Codeine
   c. Patient’s ability to assist
   d. Date of last bowel movement

4. According to SPH regulation, the Registered Nurse (RN) is responsible for which of the following?
   a. Ordering medications
   b. Making all occupied beds
   c. Using the Braden scale to identify fall risk
   d. Coordinating and overseeing the patient transfers

5. According to the National Institute for Occupational Safety and Health (NIOSH), the recommended weight limit for patient lifting tasks is:
   a. 15 pounds
   b. 25 pounds
   c. 35 pounds
   d. 45 pounds

Answers to Study Questions


If you answered all of the questions correctly, go on to the next section. If you missed one or more, read the content again and repeat the study guide questions.
PREVENTION OF PRESSURE ULCERS

Objectives:

Upon completion of this section, the workforce member will be able to:

1. Recognize the principles for optimal skin care
2. Recognize correct “off-loading” or “floating” of bony prominences
3. Identify the components included in skin inspection/assessment
4. Know when to apply the Braden Scale to assess pressure ulcer risk
5. Identify pressure ulcer prevention interventions
6. Recognize where to document skin care in ORCHID
7. Understand pressure ulcer staging and proposed pressure injury staging

I. Introduction

As nurses we cannot control the number of patients that are admitted to our facility with pressure ulcers. However, we can reduce the number of patients who develop Hospital Acquired Pressure Ulcers (HAPU) since pressure ulcers and injuries often develop in patients with suboptimal care. In patients who receive optimal care and still develop a HAPU, ulcers and injuries only become “unavoidable” when optimal care is implemented and documented.

In the spring of 2016, the National Pressure Ulcer Advisory Panel (NPUAP) made updates regarding terminology. Changes to the stages of pressure ulcers were changes to title and wording. The Joint Commission has adopted NPUAP pressure ulcer/injury updates. Currently, the Centers for Medicare and Medicaid Services (CMS) are in the process of adopting these changes. Upon CMS adoption, ORCHID will be reflecting these terminology changes. The term “pressure ulcer” will be replaced with the term “pressure injury” to describe skin breakdown related to pressure.

II. Skin Inspection/Assessment

Completed:

- On admission, within 8 hours
- Minimum of every shift
- According to unit protocol
- PRN (example: change in patient condition)

Head-to-Toe inspection includes:

- Palpation of bony prominences
- Skin folds, buttocks, hair, toes
- Skin moisture status
- Tissue tolerance to support surface (e.g. bed, mattress, overlay)
  - Tissue tolerance = the ability of the body’s soft tissue (e.g., epidermis, dermis, adipose, muscle) to withstand a load before sustaining damage.
- Appropriateness of support surface with patient outcomes
- Temporarily removing items placed for protection over bony prominences (some may require a Provider’s order prior to removal)
  - Medical devices
  - Protective dressings
III. Pressure Injury Risk Assessment “Braden Scale”

A. Pressure Injury risk is communicated during hand-off.

B. Individualized interventions are to be implemented and documented as appropriate when patients are identified “at risk”

C. Risk assessment is made based on all of the following:
   - Clinical condition of the patient
   - Head to toe assessment
   - Braden Scale risk score
   - Nursing judgment

D. Braden Scale is to be completed:
   - On admission (within 8 hours)
   - Daily
   - Upon transfer
   - PRN/change in condition
   - After prolonged procedures (more than 2 hours)

E. Pediatric patients: use Braden Q as appropriate/according to facility/unit protocol

IV. Skin Care

A. Principles of optimal skin care:
   1. Cleanse skin daily
   2. Moisturize dry skin
   3. Use skin barrier or paste to protect skin exposed to moisture from stool/urine, wound drainage, tracheostomy/stoma effluent, or perspiration.
   4. Develop and implement an individualized continence management plan.

B. Use appropriate skin care products (facility specific) for the condition of the skin:
   1. Dry skin
   2. Moist skin
   3. Open skin or skin constantly exposed to moisture
V. Offloading

Offloading or “floating” of bony prominences ideally allows for pressure relief to areas such as the heels, elbows, or sacrum/coccyx. When offloading, these bony prominences should not make contact with the support surface.

- Floating of heels can be achieved with the use of pillows or offloading heel protectors that have a manufacturer cut-out at the heel area
- Floating of the sacrum/coccyx can be achieved by placing patients in a 30-degree pelvic tilt/turn (avoid placing patient directly on trochanters)

VI. Principles Related to Staging Pressure Ulcers (proposed - Injuries)

- The wound should be cleaned before staging
- Etiology must be from pressure
- Determine if the microclimate is adverse
  - Microclimate – refers to the temperature and humidity of the interface between the support surface and the patient
- Classification/staging is done in accordance with the amount of visible tissue loss.
  - **Note:** NO REVERSE STAGING!
  - Example: As a Stage III pressure ulcer heals it is still classified as Stage III (not a Stage II)
- One stage per bony prominence

VII. Basic review of skin & tissues

A. Partial thickness skin loss

- Includes epidermis, may also include dermis
- Heals by “regeneration” or actual replacement of epidermis/dermis lost
- No visible scarring seen upon wound closure

B. Full thickness wound

- Complete loss of epidermis and dermis (skin layers)
- Includes adipose tissue and may include fascia, ligaments, tendon, cartilage, muscle, bone
- Heals by “wound repair” or wound fillers (e.g. granulation tissue) that replaces tissues lost
- Tissues lost are not regenerated
- Wounds heal by filling – visible scar tissue will be seen during healing process and closure

VIII. Upon discovery: prior to staging!

A. Ask yourself:

- Is the skin intact?
- Is there partial thickness or full thickness skin loss?
- Is it over a bony prominence?
- Was there a medical device in use?

B. Ask the patient:

- How do you believe this wound began?
- Pain?
- Duration?
- Recurrences?
- Daily activities? (e.g. bowel/bladder management, wheelchair)
IX. **Proposed Changes in Pressure Ulcer Staging Terminology**

<table>
<thead>
<tr>
<th>CURRENT: ULCER</th>
<th>PROPOSED: INJURY</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Stage I</td>
<td>*Stage 1</td>
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<tr>
<td>* Stage II</td>
<td>*Stage 2</td>
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<tr>
<td>* Stage III</td>
<td>*Stage 3</td>
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<tr>
<td>* Stage IV</td>
<td>*Stage 4</td>
</tr>
<tr>
<td>* Unstageable</td>
<td>*Unstageable</td>
</tr>
<tr>
<td>sDTI</td>
<td>*Deep Tissue Pressure Injury (DTPI)</td>
</tr>
<tr>
<td>Mucosal Membrane</td>
<td>*Mucosal Membrane Pressure Injury</td>
</tr>
</tbody>
</table>

**Stage I Pressure Ulcer:** Non-blanchable erythema of intact skin  
(proposed Stage 1 Pressure Injury)

- Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin
- Presence of blanchable erythema or changes in sensation, temperature or firmness may precede visual changes
- Color changes do not include purple or maroon discoloration

**Stage II Pressure Ulcer:** Partial thickness skin loss with exposed dermis  
(proposed Stage 2 Pressure Injury)

- Pink or pinkish red viable tissue
- Intact or ruptured serum-filled blister
- No slough, no bruising, no granulation tissue

**Stage III Pressure Ulcer:** Full thickness wound  
(proposed Stage 3 Pressure Injury)

- No muscle, bone, tendon/cartilage/fascia/ligament exposed
- Adipose/epibole may be visible
  - Epibole = rolled/curlled under closed wound edges that may be dry, calloused, or hyperkeratotic
- Granulation tissue present
- Any hospital acquired pressure ulcer with full thickness wound (Stage III, Stage IV, or Unstageable) must be reported to the state within 5 days of occurrence
- Slough/eschar may be present but does not obscure the wound base

**Stage IV Pressure Ulcer:** Full thickness wound  
(proposed Stage 4 Pressure Injury)

- Muscle
- Fascia
- Cartilage/tendon
- Exposed or palpable bone
- Undermining/tunneling
- Slough/eschar
- Any hospital acquired pressure ulcer with full thickness wound (Stage III, Stage IV, or Unstageable) must be reported to the state within 5 days of occurrence.
**Unstageable:** Obscured full-thickness wound

- Obscured by slough/eschar
- Will be either stage III or IV
- Stable eschar on heels/ischemic limb should not be softened/removed
- Any hospital acquired pressure injury with full thickness skin loss (Stage III, Stage IV, or Unstageable) must be reported to the state within 5 days of occurrence.

**Suspected Deep Tissue Injury (sDTI):**
(Proposed Deep Tissue Pressure Injury (DTPI))

- Maroon/purple/deep red
- No granulation tissue
- May resolve or evolve
- May have blood-filled blister
- May have epidermal separation

*Note:* As the wound evolves, it may expose full thickness tissue loss. If full thickness wound is present, the wound should be classified as a Stage III, Stage IV or Unstageable.

**X. Other Pressure Tissue Issues**

**Mucosal Membrane Pressure Ulcer**
(Proposed Mucosal Membrane Pressure Injury)

- Non-keratinized stratified squamous epithelium (mucosal lining)
- Injury causes tissue to bleed and forms a clot that looks like slough
- Due to anatomy of the tissue, these injuries cannot be staged
- Most injuries heal without scar tissue

**Medical Device Related Pressure Ulcer**

Medical Device Related Pressure Ulcer is not a separate pressure ulcer stage, but specifies that the pressure ulcer (proposed injury) was caused by a medical device

- Takes the shape of the device
- Stage using the staging system and add after staging nomenclature (e.g., “Unstageable Medical Device Related Pressure Ulcer”)

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2017 DHS Nursing Inpatient Annual Core Competency Study Guide: Licensed Patient Care Areas
XI. Pressure Ulcer Prevention - Interventions

“S-K-I-N” is a pressure ulcer prevention bundle. The acronym “S-K-I-N” can be used as an organizational tool, providing a systematic approach to remind nurses of the key elements already being utilized in existing pressure ulcer prevention bundles. Thinking “S-K-I-N” may make it easier for you as a nurse to recall pressure ulcer prevention interventions to incorporate into daily assessments and documentation.

Individualized interventions should be implemented and documented for patients who have been identified to be at risk for pressure ulcers. Individual interventions may vary based on appropriateness for the patient and when implemented, help reduce the incidence of pressure ulcer development.

S - Surfaces

• Examples:
  o Bed/mattress – document this daily in ORCHID (use facility “Specialty Bed Algorithms” for selection guide - if available)
  o Wheelchair cushions
  o Padded commodes
  o Shower benches

• Minimize layers of linen under patient
• Do not use incontinent briefs (diapers) when the patient is in bed

K - Keep moving/turning

• Encourage and assist with activity
• Turn/reposition every 2 hours
• Offload/float bony prominences (e.g., heels, sacrum-coccyx)
• Limit the time patient spends seated in a chair without pressure relief
• Pressure relief in wheelchair:
  o every hour if patient requires assistance:
    ▪ follow individual facility guidelines
    ▪ for at least one full minute if the patient does not have a wound on the torso
    ▪ for two minutes if the patient has a wound on the torso
    ▪ (Rancho only) at least two minutes even if the patient does not have a wound on the torso
  o every 15 minutes if patient independent
    ▪ for 15 seconds
• Temporary removal of medical devices/tubing for pressure relief (may require a Provider’s order for removal)

I - Incontinence & moisture management

• Keep wound drainage, urine, stool off skin
• Do not use incontinent briefs (diapers) when the patient is in bed
• Keep skin clean, dry and moisturized:
  o Use skin cleanser promptly following incontinence and/or
  o Use skin barrier protectant cream/paste
• Follow bowel/bladder programs
• Provide peri-stomal care

N – Nutrition

• Adequate food/fluid intake: protein, supplements, water intake
• Monitor weight and loose stools
• Eliminate barriers to eating (e.g., wearing dentures, brushing teeth daily)
• Monitor and document patient’s intake
XII. ORCHID Documentation

**Pressure Redistribution Surface (Name of Bed Type) & Routine Positioning**

### Bed Type Examples
Acceptable documentation includes “air-fluidized”, “low–air loss”, “specialty” or “other”- type in name of pressure redistribution bed/mattress.

Examples of positioning/pressure reducing devices include: off-loading devices, heel protectors

### Moisture

Scroll to find **Hygiene ADLs**

Review Personal Care provided under “Other”.

Any notation stating “Skin barrier cream/paste applied” is acceptable

Examples of “Personal Care Provided” include “Bed Bath”, “Bed Bath with CHG”, “Peri-care”, “Shower”, and topical barriers
#### PATIENT’S AVERAGE MEAL INTAKE PERCENTAGE

- Make sure a percentage is documented for each meal

<table>
<thead>
<tr>
<th>Diet Type</th>
<th>Breakfast Percent</th>
<th>Lunch Percent</th>
<th>Dinner Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

- Morning Snack Percent
- Afternoon Snack Percent
- Evening Snack Percent
- Feeding Tolerance

#### NUTRITIONAL SUPPORT

- Dietary Supplement
- iView and I&O
- Intake and Output

Enter any Dietary Supplement under Oral Intake (e.g. Ensure, Jevity, Glucerna, Liquid Protein) in mL’s

<table>
<thead>
<tr>
<th>Oral Intake</th>
<th>mL</th>
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</thead>
<tbody>
<tr>
<td>Milk Oral Intake</td>
<td>mL</td>
</tr>
<tr>
<td>Coffee Oral Intake</td>
<td>mL</td>
</tr>
<tr>
<td>Juice Oral Intake</td>
<td>mL</td>
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<tr>
<td>Ensure Oral Intake</td>
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</tr>
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<td>Water Oral Intake</td>
<td>mL</td>
</tr>
<tr>
<td>Liquid Protein Oral Intake</td>
<td>mL</td>
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</tbody>
</table>

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
PREVENTION OF PRESSURE ULCERS
Study Questions

Select the best answer to each question.

1. The Braden Scale to identify pressure ulcer risk is completed:
   a. Monthly
   b. Discharge only
   c. Admission only
   d. Admission, daily, and a change in patient condition

2. Principles of optimal skin care include:
   a. Cleanse skin daily
   b. Moisturize dry skin
   c. Protect skin that is exposed to moisture
   d. All of the above

3. Which statement is FALSE regarding staging pressure ulcers?
   a. Partial thickness skin loss includes the epidermis and/or dermis
   b. Pressure ulcers are staged according to the amount of visible tissue loss
   c. Reverse staging of patient’s pressure ulcer should be done as the pressure ulcer heals
   d. Scar tissue will be visible during the healing process and closure with full-thickness wound

4. Where in ORCHID are the skin interventions documented?
   a. MAR
   b. Vital Signs section
   c. Dynamic Group
   d. Quick View/ADLs (Activities of Daily Living)

5. Which photo below best represents a mucosal membrane pressure ulcer?

a. ![Mucosal membrane pressure ulcer image](image1.png)
   b. ![Mucosal membrane pressure ulcer image](image2.png)
6. Which picture best represents “offloading” or “floating”?

a. ![Image A]
   b. ![Image B]

---

**Answers to Study Questions**


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If you answered the questions correctly, go on to the next section. If you missed the question, read the content again and repeat the study guide question.
INJURY PREVENTION

Objectives: Upon completion of this section the workforce member will be able to:

1. Verbalize the impact of work-related injuries
2. List risk factors associated with work-related injuries
3. Recall strategies for reducing work-related injuries

I. Introduction

Workplace injuries such as pulling a back muscle, eye strain, and carpal tunnel syndrome occur more commonly than you might think (Himiak, 2011). Work-related injuries affect the muscles, nerves, and tendons. Work-related injuries, including those of the neck, upper extremities, and low back are among the most frequently reported causes of lost or restricted work time. Workers in many different industries and occupations, including healthcare, can be exposed to risk factors at work. In fact, in 2011 the Bureau of Labor Statistics reported healthcare as one of the highest industries to experience work-related injuries (Occupational Safety & Health Administration [OSHA], n.d.).

Employers are responsible for providing a safe and healthful workplace for workforce members. In the workplace, the number and severity of injuries resulting from physical overexertion, as well as their associated costs can be substantially reduced (OSHA, n.d.). Using basic body mechanics and applying ergonomic principals, workforce members reduce the risk of developing a work-related injury.

II. Risk Factors for Developing Work-Related Injuries

The following have been identified as risk factors for developing work-related injuries:

- Lifting heavy items
- Using a keyboard, mouse, and monitor
- Sitting for long periods of time or sitting the wrong way (e.g., slouching, chair too high or too low)
- Bending
- Reaching overhead
- Pushing heavy loads
- Pulling heavy loads
- Working in awkward body positions
- Performing the same or similar tasks again and again

III. Strategies for Preventing Workplace Injuries

A. Ergonomics

Ergonomics is the science of work and a person’s relationship to that work. Workforce members work more efficiently and reduce the risk of injury while at work when the following ergonomic principals are applied:

- Avoid prolonged sitting
- Avoid slouching
- Properly adjust chair and desk heights; your feet should be on the floor
- Change your seated posture and support to fit your activity
- Remove all items from your pockets before sitting at your desk
• Perform exercises on your:
  
  o Arms
  o Fingers and hands
  o Wrists
  o Neck

  o Shoulders
  o Waist
  o Upper back

• Do an alternate task or take exercise breaks
• Position your hips so they are back against the chair and at the same height as your knees
• Arrange your work area so that you reduce the stressors placed on your body
• Minimize bending, twisting, and over-reaching
• Arrange tasks or yourself so that your work is in front of you
• Properly position yourself and equipment around you while working at a computer/desk

  o Keyboard-Place the keyboard directly in front of you. As you type, your arms should hang comfortably and your shoulders should feel relaxed. Adjust the slope of your keyboard for wrist, hand, and forearm comfort, and use rest pads
  
  o Mouse-Position mouse immediately to the right or left of your keyboard, and only use a mouse that fits well in your hand
  
  o Monitor-Raise the monitor so the top of the screen is at eye level, and position the monitor directly in front of you

B. Basic Body Mechanics

Body mechanics is the use of correct muscles to complete a task safely and efficiently, without undue strain on any muscle or joint. Basic body mechanics incorporate the following principals:

• Determine the heaviness of the load
• Keep your back straight (in its natural curve)
• Maintain a wide base of support (shoulder and legs)
• Hold objects as close to you as possible
• Avoid twisting when carrying
• Tighten stomach muscles when lifting
• Think before you lift; have a plan
• Lift with the legs not with your back
• Maintain good communication if two or more people are involved
• Move obstacles out of the way
• Push rather than pull
• Eliminate repetitive lifting if possible
• Bend at the knees when bending to pick up objects. Do not keep legs straight or bend at the waist.
• Follow the basic rules of posture
  o Head should sit directly over the neck with chin tucked in slightly
  o Ears should be over the shoulders
  o Shoulders should be level and “squared” back, not slumped forward
  o Mid-back should be straight up and not slumped forward
  o Hips should be in line with shoulders and ankles when standing
  o Hips and knees should be at 90-degree angles when sitting
  o A lumbar support can help maintain a natural curve in the lower back

C. Behind the Desk Stress can also be reduced by:
  • Changing your posture
  • Positioning for the task
  • Supporting your back
  • Adding activity to your daily routine
  • Exercising regularly
  • Relaxing

IV. Conclusion

Work-related injuries negatively impact workforce members. These injuries may be reduced, and even prevented, when basic body mechanics are used and ergonomic principals applied. By making a few changes in the way that you work, you are joining your employer in making a commitment to providing a safe and healthy workplace.

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
INJURY PREVENTION
Study Questions

Select the best answer to each question.

1. Work-related injuries may result in:
   a. Lost work time
   b. Improved vision
   c. Less physical exertion
   d. Strengthening muscles

2. Which of the following is a risk factor for developing a work-related injury?
   a. Bending
   b. Sizing up the load
   c. Avoiding prolonged sitting
   d. Maintaining a wide base of support

3. Which of the following reduces the risk of a work related injury?
   a. Reaching overhead
   b. Pulling a heavy load
   c. Using a keyboard, mouse, and monitor
   d. Doing alternate task or taking exercise breaks

4. While working at a desk or computer, you should:
   a. Stay in your chair for as long as possible
   b. Properly position yourself and equipment around you
   c. Twist your body to help you reach for items that are behind you
   d. Move all items as far away from you as possible so that they are not in your way

5. Basic body mechanics include:
   a. Slouching
   b. Holding objects as close to you as possible
   c. Keeping all items in your pockets while sitting at your desk
   d. Arranging tasks or yourself so that your work is at your side

Answers to Study Questions


If you answered all of the questions correctly, go on to the next section if you are a direct care provider. If you missed one or more, read the content again and repeat the study guide questions.
FALL PREVENTION

Objectives:

Upon completion of this section, the licensed workforce member will be able to:

1. State the assessment tools that are used to determine fall risk for adult and pediatric inpatients
2. Describe when fall risk assessments are conducted in the inpatient setting
3. Identify three age-related, environmental, or medical risk factors related to falls
4. Recognize three strategies to prevent falls in patients at high risk for falls
5. List the steps to take when a fall occurs

I. Introduction

Falls are the leading cause of injuries for both children and adults and are the leading cause of injury-related death for individuals 65 years of age and older. In addition, falls are the number one adverse event and most frequent cause for damage claims in patient care. In 2000, the total cost of fall-related injuries for those 65 years of age and older was more than $19 billion dollars and by 2020 the cost is expected to be at least $43.8 billion. Falls are also the leading cause of non-fatal injuries for all children ages 0 to 19, totaling almost 2.8 million injuries each year (Centers for Disease Control and Prevention, 2016).

To address this serious patient safety issue, the Department of Health Services (DHS) implemented a system-wide fall prevention program at all DHS hospitals and outpatient settings to reduce the number of falls and minimize fall-related injuries.

- All hospital-based ambulatory and emergency care patients 1 year of age and older* must be screened for fall risk using the age appropriate screening tool. Those at risk will wear a yellow fall risk armband.
- *Follow hospital-specific policy regarding minimum age

II. Definition of a fall

A patient fall is a witnessed or un-witnessed unplanned descent to the floor (or extension of the floor, e.g., trash can or other equipment) with or without injury to the patient. All types of falls are included whether they result from physiological reasons (fainting) or environmental reasons (slippery floor). This includes assisted falls such as when a staff member attempts to minimize the impact of the fall by easing the patient’s descent to the floor or by breaking the patient’s fall.

III. General Fall Risk Factors

There are many factors that place a patient at risk for falls, including age related, medical, and environmental factors. It is important that healthcare providers are aware of the risk factors so that they can plan strategies to prevent patients from falling.

A. Age related risk factors include:

- History of falls
- Decreased muscle strength and/or sensation
- Slow reflexes
- Poor vision
- Loss of hearing
- Forgetfulness and/or dementia
- Changes in sleep patterns
- Changes in urinary function

### B. Medical risk factors include:
- Mental impairment (e.g., poor judgment, impulsivity, confusion)
- Dizziness
- Medications that cause drowsiness (e.g., medications for pain, sleep, seizures)
- Arthritis
- Osteoporosis
- Sore feet
- Decreased bladder control
- Impaired mobility
- Impaired sensation

### C. Environmental risk factors include:
- Poor lighting
- Clutter on floor/bedside table
- Wet floor/ground
- Bedside table not within patient's reach
- Chairs and other items blocking the route to the bathroom
- Incorrect use of side rails
- Presence of tubes, IV poles
- Tripping hazards (e.g., electrical/phone cords, toys, linen on the floor)
- Climbing on a movable chair
- Leaning back in chair
- Overreaching/overstretching
- Uneven ground (e.g., folded floor mats/area rugs, uneven cracks in pavement)
- Stairs without handrails
- Not locking breaks during transfers
- Call light out of reach or malfunctioning

### IV. Risk Determination

#### A. Morse Fall Scale (Adult)

1. **Low risk:** Any adult patient who scores 0-24 on the Morse Fall Scale is considered low risk. Level 1 interventions will be implemented for these patients.

2. **Moderate risk:** Any adult patient who scores 25-50 on the Morse Fall Scale is considered moderate risk. Level 2 interventions will be implemented for these patients in addition to Level 1 interventions.

3. **High risk:** Any adult patient who receives a score of 51 or higher on the Morse Fall Scale is considered high risk. Level 3 interventions will be implemented for these patients in addition to Level 1 and level 2 interventions.
4. When a patient is identified as moderate to high risk for falls, nursing staff will:

- Initiate Plan of Care (POC)
- Place a yellow plastic “fall risk” alert wrist band on the patient
- Secure a sign at the entrance to the patient’s room/head of patient’s bed
- Attach fall prevention stickers to the medical record

B. Humpty Dumpty Scale (Pediatrics)

1. **Low risk:** Any pediatric patient who scores 7-11 on the Humpty Dumpty Scale is considered low risk. General fall prevention interventions will be implemented for all children.

2. **High risk:** Any pediatric patient who scores 12 or above on the Humpty Dumpty Scale is considered high risk for falls and will be placed on Fall Prevention Measures for the duration of his/her hospitalization.

   - If the RN determines that a child no longer meets the “high risk” criteria, the nurse may perform a falls risk reassessment and document a justification indicating why high risk status and related Fall Prevention Measures are being discontinued.
   - If the RN determines that a particular pediatric patient is at risk for falls, in spite of not meeting “high risk” criteria, the nurse may identify the child as high risk for falls and initiate Fall Prevention Measures.

V. Fall Prevention Measures

A. Fall Prevention Measures (Adults)

   - **Level 1 Interventions for patients assessed as low risk: (0-24)**

     - Discuss patient’s risk for falls with interdisciplinary team
     - Include fall risk level, supervision provided, and observation of unsafe behaviors during hand off communication between staff
     - Provide patient/family education related to fall prevention
       - Purpose and importance of fall/injury prevention measures
       - Use of call light/maintaining bedrails in appropriate position
       - Safe ambulation/transfer techniques
       - Importance of wearing non-skid footwear
       - Reporting environmental hazards to nursing staff, e.g., spills, cluttered passages
     - Encourage family/significant others to assist with fall reduction strategies once fall management training is completed. **(Note: staff remains responsible for overall safety of patients even with family in attendance.)**
     - Perform intentional/purposeful nursing rounds
     - Orient patient to surroundings and hospital routines
     - Communicate patient’s “at risk” status during hand-off communication
     - Set bed in lowest position with brakes locked
     - Place personal belongings within reach on bedside stand/table
     - Reduce room clutter by removing unnecessary equipment and furniture
     - Provide non-skid (non-slip) footwear
Level 2 Interventions for patients assessed as moderate risk: (25 – 50)

- Place a yellow “fall risk” alert wrist band on the patient
- Attach fall prevention stickers to the chart light medical record
- Place a sign at the entrance to the patient’s room and/or head of the patient’s bed
- Offer toileting every 2 hours
- Activate the bed alarm and wheelchair seat belt alarm, if equipped

Level 3 Interventions for patients assessed as high risk: (51 and higher)

- Increase frequency of nursing intentional rounds based on patient need
- Collaborate with interdisciplinary team regarding therapy schedule/activities
- Include fall risk level, supervision provided, and observation of unsafe behaviors during hand off communication between staff
- Place the patient in a room or area where they can be easily observed, when possible
- **Stay with patient at all times while toileting out of bed**
- Cohort patients, when possible
- Provide continuous observation, if needed
- Minimize restraint use; however, if needed apply per facility policy

Follow facility-specific policy for additional fall prevention measures.

B. Fall Prevention Measures (Children)

1. General Injury Prevention Measures for all pediatric patients

- Do not leave children unattended when using equipment such as strollers, walkers, infant seats or swings
- Leave crib side rails up at all times unless an adult is at the bedside.
- Determine bed type and size based on child’s developmental and clinical needs
- Instruct patient/parent on how to prevent falls in the hospital setting
  - Maintain side rails in appropriate position
  - Keep crib rails up
  - Do not allow child to jump on bed, run in room/hallway, or climb on furniture/equipment
  - Importance of wearing non-skid footwear
  - Notify nurse if child complains of dizziness, feeling weak or seems less coordinated than usual
  - Notify nursing staff of environmental hazards (e.g., spills, cluttered passages)
  - Supervise child’s activities (e.g., walk next to child and provide support as strength and balance are regained)

2. Fall Prevention Measures (Pediatrics, Humpty Dumpty score 12 or greater)

- Consider locating patient closer to nursing station for closer observation
- Assess and anticipate reasons patients get out of bed, such as elimination needs, restlessness, confusion, or pain
- **Stay with child at all times while toileting out of bed**
- Offer assistance with toileting every 2 hours while awake
- Provide calming interventions and pain relief
- Accompany patient with ambulation
• Monitor medication profiles for patients receiving medications that may increase their risk for falls (e.g., narcotics, sedatives, anti-seizure medications)
• Set bed alarms, as appropriate, to alert staff
• Evaluate need for and encourage family to remain at patient's bedside
• Assess need for 1:1 supervision
• Provide patient/family education related to fall prevention
  o Purpose and importance of fall/injury prevention measures
  o Use of call light/maintaining bedrails in appropriate position
  o Safe ambulation/transfer techniques
  o Instruct family to inform nurse/provider if child seems less coordinated than usual or complains of dizziness or feeling weak
  o Instruct family that until child regains strength, walk alongside the patient to provide support and protection in case of loss of balance

VI. Post Fall Procedure

DHS has implemented the following algorithm to be followed in case a patient falls at inpatient facilities. This algorithm outlines the responsibilities of the first responder, the RN, and the Licensed Provider (i.e., physician, physician’s assistant).

A. First Responder will:

• Stay with patient
• Call for help
• Check patient for pain or injury
• Check level of consciousness
• Report fall to licensed personnel
• Provide comfort measures until licensed staff member arrives and assesses patient for injury

B. RN Staff will:

• Immediately notify physician and initiate neurologic checks if patient has struck head/face and/or is on anticoagulation therapy
• Follow medical chain of command if physician does not respond at bedside within the hour
• Document clinical status and description of fall in medical record
• Complete Fall Risk Reassessment and update care plan
• Implement additional intervention as needed or as ordered (e.g., increased level of supervision)

C. Licensed Provider (physician, physician’s assistant) will:

• Assess patient as soon as possible after fall
• Provide follow-up orders, medical, and diagnostic work-up, and care as indicated
• Review patient’s medications. If patient is on anticoagulation therapy and has struck head, consider indication for radiographic exams, including head CT scan or MRI
• If patient shows change in neurological status, consider transfer to a higher level of care.
• Notify emergency contact and document notification in medical record
• Recommend additional steps for fall prevention
VII. Documentation

A. Outpatient: For patients at risk for falls, staff will document the following on appropriate outpatient record:

- Fall screening
- Fall risk
- Fall prevention measures and patient education provided

B. Inpatient: The staff will document the following on the appropriate forms:

- Initial assessment and ongoing reassessments
- Patient/family education related to falls
- Ongoing safety precautions
- Any fall incident, related assessments, and notification of physician/family
  - All falls, including near misses, must also be reported on the SI

VIII. Conclusion

Falls can be severe and life threatening. It is the responsibility of every healthcare worker to prevent falls. In order to do so, healthcare providers must be able to identify risk factors, understand how to assess their patients’ fall risk, determine fall prevention measures, and intervene quickly and effectively to minimize patient injury should a fall occur.

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
FALL PREVENTION
Study Questions

Select the best answer to each question.

1. Which of the following is a strategy to prevent falls?
   a. Instruct patients at risk for falls to call for help before getting out of bed
   b. Place patients at risk for falls far from the nurses’ station to avoid disturbing them
   c. Keep crib rails down so children will not have to crawl over them to get out of bed
   d. Place bed in highest position to discourage patients from attempting to get out of bed unassisted

2. Which of the following will increase your patient’s risk for falls?
   a. Having poor vision
   b. Putting the bed in the lowest position
   c. Reducing room clutter by removing unnecessary equipment
   d. Placing patients at risk for falls with another patient in the room

3. Which scale should be used to assess an adult inpatient’s fall risk?
   a. Slippery Slope Scale
   b. Glasgow Coma Scale
   c. Humpty Dumpty Scale
   d. Morse Fall Risk Assessment

4. What color wrist band signifies that a patient is at risk for falls?
   a. Red
   b. Yellow
   c. Purple
   d. Gray

5. What should you do if you discover that your patient has fallen?
   a. Call for help
   b. It is unnecessary to report the fall if the patient appears uninjured
   c. Leave the patient and get an arm band to notify staff about the patient’s fall risk
   d. Quickly lift the patient back up onto the bed so you can better assess for injuries

PLEASE CHECK YOUR ANSWERS TO THE STUDY QUESTIONS


If you answered all of the questions correctly, go on the next section. If you missed one or more, read the content again and repeat the study guide questions.
The Medication Administration competency has two components: medication safety and medication calculation. The written Medication Administration test will contain questions pertaining to both components.

**MEDICATION SAFETY**

**Objectives:**

Upon completion of this section, the workforce member will be able to:

1. List two practices that must be followed when administering medications from a single dose vial
2. Identify the number and type of patient identifiers required prior to medication administration
3. Determine if a given medication order is acceptable
4. Identify appropriate actions to take if orders are incorrect, incomplete, illegible, or contain unapproved abbreviations
5. Discuss strategies nurses can implement to prevent medication errors
6. Identify medications that can safely be crushed/cut prior to administration
7. Identify three high alert medications
8. Describe nursing safeguards when administering high alert medications
9. Define black box warning and give three examples of high priority black box warning medications
10. Describe nursing safeguards when administering medications with a black box warning
11. Identify two medications that look alike/sound alike
12. Identify two strategies to minimize errors associated with look alike/sound alike medications
13. State frequency of checking and reporting refrigerator temperatures used to store vaccines
14. Determine when to use oral syringes
15. Define a near miss error
16. Discuss the purpose of reporting a near miss medication error
17. List adverse effects of opioid use
18. State two safe PCA administration practices
19. Discuss safety considerations to prevent adverse effects for a patient prescribed an opioid
20. Describe the role of Equianalgesic Conversion tables in the administration of opioids.
21. Identify causes of hypoglycemia in hospitals
22. Identify at least four signs and symptoms and treatment of hypoglycemia
23. Identify purpose of performing a pre-assessment and post-assessment when giving medications
24. List at least three pointers to remember when administering pain medications
I. Introduction

The process of safely providing medications to hospitalized patients is highly complex and involves multiple systems and diverse healthcare professionals. The licensed nursing staff plays an important role in maintaining patient safety throughout this complex, multiphasic process. This competency will review standards for safe practice, specific safe medication strategies that nurses may use to promote patient safety, high alert medications, and black box warnings.

II. Standards for safe practice

Standards for safe practice include having the knowledge base to safely administer drugs, adhering to correct administration principles, ensuring security of medications, and adhering to principles of infection control.

A. Knowledge base

The licensed nursing staff must know the classification/action, indications, usual dosage, route, side effects, contraindications, and nursing implications of all medications administered. Refer to current and appropriate references for drug information. Examples of resources include:

1. Pharmacy
2. Micromedex® Healthcare Series (facility intranet)
3. Drug reference books (must be current and appropriate for population)
4. Drug inserts
5. Pharmacy journals

B. Principles of medication administration – the “Eight Rights”

The “eight rights” is a standard of care that each nurse must utilize every time medications are administered. Until several years ago, only five rights of medication administration had been identified, including right patient, medication, dose, route, and time. However, these five rights did not address all the significant aspects of medication administration that might jeopardize patient safety. Issues such as accurately documenting all pertinent information after giving a medication, verifying the rationale for each ordered medication, and making sure the medication administered had the intended effect had not been considered. Thus, three additional rights were added to the list. The current eight rights of medication administration include:

1. Right patient
2. Right medication
3. Right dose
4. Right route
5. Right time
6. Right documentation
7. Right reason
8. Right response

The eight rights are important for safe medication practice, but they do not stand alone as measures to prevent medication errors. For example, the eight rights do not address how to avoid errors of omission or methods to address improper rate/method of IV medication administration or administration technique. The eight rights do not address illegible handwritten orders, the use of unapproved abbreviations that may lead to misinterpretation, confusing medication labels, or distractions/interruptions. Other strategies for preventing medication errors must be implemented in addition to following the eight rights.
C. Medication security

Unless otherwise specified by facility policy:

1. The nurse must ensure the security of all medications at all times.
2. The nurse in charge of a unit or area is accountable for medications and solutions maintained in the area.
3. Medication rooms and carts must be kept locked when not in use.
4. Medication carts and trays must be kept under constant surveillance when being used.
5. Keys for medication rooms and carts must be carried only by licensed nursing staff.

D. Infection control

The licensed nursing staff must observe infection control measures at all times when administering medications. This includes ALWAYS performing hand hygiene before and after medication administration.

In addition to general infection control measures that must be adhered to when administering any medication, there is also a specific set of minimum standards that must be followed when administering injections to prevent the spread of pathogens, such as Hepatitis C virus and Hepatitis B virus. The misuse of vials is a major culprit in the spread of infections when giving injections. This is mainly the result of reusing single-dose vials intended to be used one time for one patient. Single-dose vials generally do not have preservatives. As a result, using these vials more than once significantly increases the risk of bacterial contamination and infection. The CDC emphasizes that the following practices are absolutely vital for ensuring patient safety:

- NEVER administer medications from the same syringe to more than one patient, even if the needle has been changed or injection is performed through a portion of the IV tubing even a distal IV tubing port
- NEVER insert a used needle or syringe into a medication vial, bag, or bottle
- NEVER use medications packaged as single-dose or single-use for more than one patient
- ALWAYS use aseptic technique when preparing and administering medications

Following the above recommendations is absolutely essential to maintain safe injection practices and ensure patient safety.

III. Nursing strategies for safer medication administration

A. Assess allergy status before administering any medication.

All healthcare providers must be aware of any allergies that the patient has prior to administering medications. If a patient develops an allergic response, he/she must be informed and instructed to notify future healthcare providers of the name of the medication and his/her response to it. Facility specific procedures for communicating allergy status shall be followed.

B. Carry out only those orders that are complete, accurate, legible, and do not contain unapproved abbreviations.

1. Complete and correct orders
   a. Prescriber orders must be legible and complete.
   b. At a minimum, a complete medication order includes the following information (additional requirements may be required by the facility):
• Patient’s name
• Patient’s medical record number
• Date
• Time
• Signature of ordering practitioner (prescriber ID also required in many facilities)
• Name of medication
• Dose (note: range orders are not acceptable)
• Frequency
• Route of administration
• PRN medications must also include indication (e.g., pain, nausea) and frequency

EXAMPLE:

Unacceptable PRN order: Acetaminophen 500 mg PO prn

Acceptable PRN order: Acetaminophen 500 mg PO q 4 hours prn moderate pain

c. Special requirements for special populations
In addition to the above requirements, certain populations or medications may require additional information. For example, it is generally recommended that medication orders for infants and children include the patient’s weight, dose/kg/time interval, and total dose.

C. Do not use unapproved abbreviations.

Misinterpretation of dangerous expressions and abbreviations has shattered the lives of innocent patients, their families, and healthcare providers who have made tragic mistakes. The Joint Commission’s National Patient Safety Goal of improving communication within an organization calls for organizations to standardize the abbreviations, acronyms, and symbols used throughout the organization, including a list of abbreviations, acronyms, and symbols NOT to use. The dangerous abbreviations apply to all orders and all medication-related documents, including preprinted forms. Although each facility maintains a list of their own “Do Not Use” abbreviations, The Joint Commission (TJC) requires each facility to include in their list the abbreviations listed in Table 1. Prescriber orders that contain any of the “do not use” abbreviations must be corrected prior to the order being noted and carried out by the nurse.

Table 1. The Joint Commission’s Official “Do Not Use” List.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Potential Problem</th>
<th>Preferred Term</th>
</tr>
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| U (for unit) | Mistaken as zero, four or cc. | Write “unit”.
| IU (for international unit) | Mistaken as IV or 10. | Write “international unit”.
| q.d. or Q.D. | Mistaken as q.i.d. especially if the period after the “q” or the tail of the “q” is missing. | Write “daily” |
| q.o.d. or O.D. | Mistaken for “q.d” (daily) or “q.i.d” (four times daily) if the “o” is poorly written. The period after the Q can be mistaken for an “I” and the “O” can be mistaken for “I”. | Write “every other day”.
| Trailing zero (X.0 mg) | Decimal point is missed and dose read as ten times too much. | Never write a zero by itself after a decimal point (X mg). |
| Zero after decimal point | Decimal point is missed and dose read as ten times too much. | Always use a zero before a decimal point (0.X mg). |
| Lack of leading zero (.X mg) | Decimal point is missed and dose read as ten times too much. | |
| MS, MSO₄, MgSO₄ | Confused for one another. Can mean morphine sulfate or magnesium sulfate. | Write “morphine sulfate” or “magnesium sulfate”.

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D. Use two patient identifiers prior to administering medications.

Two pieces of information are required to validate a patient's identification prior to the administration of any medication. Whenever possible, patients will be actively included in the identification process. The two patient-specific identifiers must be directly associated with the individual and, in the case of medication administration, the same two identifiers must be directly associated with the medication (such as an attached label). For inpatients, the usual two patient identifiers are name and medical record number. Room, bed number, or diagnosis must never be used as a patient identifier. For outpatients, the usual two identifiers are name and birthdate.

NOTE: Whenever a barcode scanner is available, scan the barcode on the patient’s identification band to identify the patient. The ORCHID electronic health record system promotes the use of a bar code scanner for medication administration and specimen collection.

E. Read the label three times - “The Three Befores”
Before administering any medication, check the label for the correct medication choice and the dosage three times:

- Before removing the medication from the shelf/unit dose cassette/automated dispensing cabinet.
- Before pouring or preparing the medication.
- At the patient's bedside, prior to administering

F. Administer medications at the appropriate time and within the appropriate time frame.

The licensed nursing staff should follow facility specific policy/procedure for medication administration times. Additionally, orders that use time related instructions such as “now”, “stat”, “pre-op” should be clearly defined by hospital policy.

Medication “Turn Around Time” is defined as the time at which an order is initially prescribed to the time when the medication is finally administered to the patient, or available for administration as defined in the standards below. The Los Angeles County Department of Health Services Medication Safety Committee has identified standard terminology to be used at each facility for these definitions.

1. STAT: 15 minutes or less (from the time medication is ordered to the time medication administration is initiated)
2. URGENT: 60 minutes or less (from the time medication is ordered to the time medication administration is initiated)
3. ROUTINE: 120 minutes or less (from the time medication is ordered to the time medication is available for administration)

G. Be sure the correct formulation of a medication is being administered.

Some medications are available in both a conventional formulation and a liposomal formulation. Three common examples are amphotericin B, doxorubicin, and daunorubicin. Liposomal medications are encapsulated in fat globules and can circulate in the blood stream for several hours after injection, as compared to the same medication in a non-liposomal form. Liposomal formulations may result in an extended treatment effect and a simplified dosing regimen for physicians and patients. However, the liposomal and conventional forms of these medications are dosed differently and are not interchangeable. To further complicate the issue, as in the case of the three different manufactured liposomal amphotericin B (Abelcet, Amphocite, Ambisome), doses may vary from product to product.
H. Alter solid forms of medications only if appropriate.

Medications come in many forms. The most common preparation is the solid form that includes tablets and capsules. Often times, pills have to be altered prior to administration. Altering a medication includes cutting, crushing, and opening. Many patients have swallowing difficulties and/or may be dependent on enteral feeding. These patients frequently use oral medications that are usually administered through the feeding tube. This means that the solid oral dosage form must be altered (e.g., a tablet must be crushed, or a capsule must be opened) in order to be administered. If the medication cannot be altered, a liquid oral dosage form or alternative route of administration must be used. The cutting or crushing of tablets or capsules can cause a number of problems. Altering a medication destroys any protective coating that the medication may have and/or destroys specialized systems inside the pill/tablet/capsule designed to deliver a medication over an extended period of time.

SCORDED TABLETS

A tablet is a mixture of active substances that have been pressed or compacted into a solid. Tablets that are meant to be taken whole are generally smooth, and lack notches on the surface. These tablets are known as *unscored* tablets (Figure 1). Some tablets have one or more notches on the surface, which allows the tablet to be cut in half so that half the dose of the tablet can be given (Figure 2). Tablets with notches on the surface are known as *scored* tablets. For example, Synthroid is available in a 75 mcg scored tablet (Figure 2). If the physician prescribes a dose of 37.5 mcg, the 75 mcg tablet can be cut in half, and one half of the tablet given to the patient.

Partial doses of solid medications should occur only if the medication is scored and able to be broken to the actual amount ordered. Take for example the Synthroid 100 mcg tablet seen in Figure 2. If the physician prescribes 25 mcg, the 100 mcg tablet cannot be cut into quarters, because it is scored only once.

**Figure 1. Unscored tablets.** These must **NOT** be broken in order to give a partial dose

**Figure 2. Scored tablets.** These can be cut in half to give a half-dose.
CAPSULES

Encapsulation refers to a range of techniques used to enclose medicines in a shell known as a capsule. Hard shell capsules are generally used to encapsulate medicine that is in the form of a powder or granule (Figure 3). Soft shell capsules are usually used to hold medicine that is in the form of oil. It is not possible to extract partial doses in exact amounts from capsules (Figure 4). Thus, capsules should not be opened, drained, or in any way altered in order to give a dose less than that contained in the capsule.

ORAL DISINTEGRATING TABLETS

An oral disintegrating tablet (ODT) is a solid dosage form containing medicinal substances which disintegrates rapidly, usually within a matter of seconds, when placed upon the tongue. ODTs can also be dissolved in water and administered via gastric tube. A common ODT is Prevacid Solutab. The ODT itself should not be cut in order to give a partial dose.

COATED TABLETS

1. Film and sugar coated tablets

Some tablets are sugar coated (such as Premarin) or film coated (such as Motrin) to protect them from light. Film and sugar coating serves a variety of purposes, including protecting the active ingredients from light and making the pill easier to swallow. Sugar and film coated tablets can be crushed, but if crushed must be administered as soon as possible to minimize the degradation of active ingredients by light.

2. Enteric-coated tablets

An enteric coated tablet is coated with a material that keeps the active ingredients from being released until they reach the small intestine. One reason for enteric coating is to prevent irritation to the gastric mucosa. Bisacodyl (Dulcolax) and Aspirin EC are coated for this reason. Splitting or crushing these tablets destroys the enteric coating and may lead to irritation of the gastric mucosa with subsequent gastrointestinal upset. Another purpose of enteric coating is to prevent disintegration of the drug in the stomach by gastric juices. Omeprazole (Prilosec) tablet is one such example. If the coating is destroyed, by crushing or chewing, the drug will be released in the stomach, where it may be improperly absorbed or inactivated and expose the stomach to potentially irritating ingredients. Cutting or crushing these tablets can lead to breakdown of the drug in the stomach, altering its effectiveness. Enteric coated tablets are not to be split or crushed. Enteric coated tablets can be identified by the initials “EC” on the label, e.g., Aspirin EC, Videx EC (Figure 5).

* For enteral tube administration, lansoprazole oral disintegrating tablet (ODT) is the preferred formulation. This formulation can be mixed in water.

MODIFIED RELEASE PREPARATIONS

The rate of drug release from its solid form can be altered by modifying its design and composition. A modified release formulation can delay, prolong, sustain, or target drug delivery. Modified release preparations allow the drug to be released over a predetermined time period, reducing the number of tablets/capsules the patient has to take each day without any loss of efficacy. Benefits of extended release preparations include improved compliance with taking medications and decreased side effects.

Sustained-release or extended release preparations allow the dosage frequency to be halved compared with conventional dosing. For example, nifedipine (Procardia) comes as a 10 mg or 20 mg liquid filled capsule and as a 30 mg, 60 mg or 90 mg extended release tablet (Procardia ER). When prescribed for stable angina, the
recommended adult dose of the immediate release preparation is 10 mg or 20 mg three to four times a day. However, the recommended adult dose of the extended release preparation is 30 mg or 60 mg once a day (Table 2). Therefore, it is imperative that the nurse reads the label prior to administering the medication to the patient and not administer an immediate release preparation if an extended release preparation has been prescribed and vice versa.

Table 2. Example of Immediate vs. Modified Release Dosing (Usual Adult Dose)

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Immediate Release Dose</th>
<th>Modified Release Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nifedipine</td>
<td>Procardia 10 or 20 mg 3-4 times a day</td>
<td>Procardia ER 30 or 60 mg once a day</td>
</tr>
<tr>
<td>Phenytoin</td>
<td>Infatab 100 mg q 8 hours</td>
<td>Dilantin Extended Release 300 mg at bedtime</td>
</tr>
</tbody>
</table>

A drug can be made to release its ingredients slowly over time by a variety of methods. A common method is to encase the tablet or capsule granules with a highly specialized material designed for slow release. **This coating is different than film, sugar, and enteric coating.**

Crushing or chewing a controlled release tablet or capsule destroys the extended-release properties, thereby shortening the duration of action, increasing serum drug levels, and increasing the risk of adverse effects or drug toxicity. Additionally, the drug’s effect will not last as long and the patient’s symptoms may recur before the next scheduled dose.

Figure 6: Toprol-XL. This extended release tablet is scored and may be cut in order to give a half-dose.

Modified release tablets should not be crushed or chewed. If the patient has swallowing difficulties or requires a liquid preparation for other reasons the provider should prescribe the liquid preparation. Cutting a modified release tablet in order to give a partial dose must be done only if the tablet is scored.

For example, the Toprol-XL tablet is a scored tablet and may be cut in half to give a half-dose (Figure 6). However, an extended release tablet must not ever be crushed.

The technology in some capsules that renders them as modified release involves surrounding each granule inside the capsule with a specialized coating. These modified release capsules can be opened and the granules mixed with a liquid or other substance for administration. Often, the substance in which the capsule can be mixed is very specific. For example, lansaprazole (Prevacid) extended release capsules can be opened and the granules sprinkled on applesauce, Ensure® pudding, cottage cheese, yogurt, or strained pears for easier swallowing. Before opening any modified release capsule, the nurse must consult a drug reference, such as Micromedex, for complete drug administration recommend. Modified release tablets and capsules can be identified by specific initials on the drug label (Figure 7).

Figure 7. Package examples of modified release pills.
There are many common abbreviations for modified-release formulations, including, but not limited to:

- CR – controlled-release
- CRT – controlled-release tablet
- ER/XR – Extended release
- LA – long acting
- MR – modified release
- SA – sustained action
- SR – sustained release/slow release
- TR – timed release
- TD – time delay
- XL – extended length

Understanding the abbreviations used on drug packaging to indicate extended release is helpful, however, relying on package label is not a substitute for verifying with a reference such as Micromedex. Drug labels do not always indicate that the drug is extended release. Avinza (morphine sulfate extended-release capsules) and Oxycontin (oxycodone controlled release) do not contain the familiar abbreviations on package label.

**SUBLINGUAL AND BUCCAL TABLETS**

Sublingual and buccal tablets must be absorbed by the vasculature of the mouth. For this to happen, the drug (sublingual nitroglycerin, for example) must be placed under the tongue for several minutes and allowed to dissolve. If the nitroglycerin tablet is crushed and swallowed, the drug would be ineffective because the liver would rapidly metabolize most of the drug. Sublingual and buccal tablets should not be cut or crushed.

**SUMMARY**

Table 3 provides a summary of general rules for altering oral medications. In addition to physical characteristics about a drug’s appearance (e.g., scored, not scored) and package labeling (e.g., identification of the medication as extended release), there are often other factors about a drug that make it safe or not safe to alter. The nurse should always consult a medication resource such as Micromedex prior to altering an oral medication for administration.

<table>
<thead>
<tr>
<th>Medication type</th>
<th>Safe to Cut?</th>
<th>Safe to Crush?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scored tablet (immediate release)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Unscored tablet (immediate release)</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Unscored tablet (extended release)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Extended release tablet or capsule</td>
<td>No*</td>
<td>No</td>
</tr>
<tr>
<td>Sublingual tablet</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Oral disintegrating tablet</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Scored sugar coated tablet (immediate release)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Enteric coated tablet</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*If scored, an extended release tablet may be cut.

I. Use only oral syringes for liquid enteral products.

Parenteral syringes have tips designed to connect to intravenous tubing and needleless IV systems. Using parenteral syringes to prepare and/or administer oral/enteral liquids is dangerous and has resulted in numerous patient deaths. It takes just a momentary lapse in concentration to mistakenly attach a parenteral syringe filled with an oral/enteral liquid to a port/stopcock/connector of an IV line.

Oral syringes come in a variety of sizes and have specially designed hubs (wider) that do not allow them to be easily connected to IV systems or needles. Parenteral syringes should never be used to prepare or administer oral liquid products.
J. Expiration of Multi-Dose Parenteral Medication Vials:

1. TJC’s Medication Management (MM) Standard MM.03.01.01, Element of Performance (EP) 7, requires organizations to store all medications labeled with the expiration date.

   a. The expiration date for **unopened** multi-dose parenteral medication vials is the date listed by the manufacturer on the vial itself. The manufacturer bases the expiration date for all drug products on the fact that the product has not been opened.

   b. Once an individual removes a vial cap or punctures a vial, the manufacturer’s expiration date is no longer valid and a revised expiration date needs to be identified. To comply with MM.03.01.01, EP 7, TJC requires organizations to relabel multi-dose vials with a revised expiration date (also called a “beyond-use” date) once staff opens or punctures a multi-dose vial. TJC requires a 28-day expiration date for multi-dose vials from the date of opening or puncture, unless the manufacturer specifies otherwise.

   c. Exceptions to the 28 day expiration rule are:

   - The manufacturer specifies otherwise in package insert or other documentation.
   - The manufacturer’s original expiration date is less than 28 days from opening or puncture, in which case the expiration date shall be the earlier date.
   - If sterility is questioned or compromised the multidose vial should be discarded.
   - Vaccines in the Centers for Disease Control and Prevention (CDC) and state immunization programs, which have separate requirements for when multi-dose vials must be discarded.

K. Storage of medications requiring refrigeration.

Failure to store medications at the appropriate temperature, as specified by the manufacturer, can have significant impact on patient care. Numerous medications have minimal tolerances for temperatures outside a relatively narrow range and once these established limits are breached, the product may be rendered less than optimally effective or ineffective. This is especially true for most vaccines. Title 22, Section 710263(q) (6) requires refrigerator temperatures to be between 2.2°C (36°F) and 7.7°C (46°F).

Refrigerators storing vaccines must have their temperature checked and recorded twice a day. It is recommended that vaccines should be stored in the middle of the refrigerator, where temperature is less likely to be affected with opening of door. Vaccines should never be stored in the door of the refrigerator or freezer.

L. Evaluate the effects of medications.

The licensed nursing staff administering the medication is responsible for assessing, reporting, and documenting the patient’s response to the medication or any untoward reactions. Evaluation is especially important when giving PRN medications, such as analgesics.

Adverse drug events (ADEs) represent one of the greatest risks of harm to patients in hospitals. ADEs include expected adverse drug reactions (or "side effects"), as well as events due to error. ADEs should be reported via the Patient Safety Network (PSN). Additionally, adverse events associated with administration of vaccines must be reported to the Vaccine Adverse Event Reporting System (VAERS).
M. Near Miss Medication Errors

1. Definition: A **near miss** is an event, situation, or error that took place but was captured before reaching the patient.

2. Examples:
   a. Penicillin was ordered for a patient allergic to the drug; however, pharmacist was alerted to the allergy during computer order entry, prescriber was called, and the penicillin was not dispensed or administered to the patient.
   b. Wrong drug was dispensed by pharmacy, and a nurse caught the error before it was administered to the patient.

3. Reporting
   - Unfortunately, more often than not, these errors have not been reported.
   - Near miss medication errors are reportable events. While the patient was not harmed, healthcare providers can learn from reviewing the events that led up to the near miss medication error. The purpose of reporting is not to be punitive, but instead to identify system problems, educate staff, and prevent future errors.
   - The reporting of a near miss medication error includes entering the event using **Safety Intelligence (SI)**. All events related to the incident should be described in detail.

N. Safety checks according to The Joint Commission:

**Before administration, the individual administering the medication does the following:**

- Verifies that the medication selected matches the medication order and product label.
- Visually inspects the medication for particulates, discoloration, or other loss of integrity.
- Verifies that the medication has not expired.
- Verifies that no contraindications exist.
- Verifies that the medication is being administered at the proper time, in the prescribed dose, and by the correct route.
- Discusses any unresolved concerns about the medication with the patient’s licensed independent practitioner, prescriber (if different from the licensed independent practitioner), and/or staff involved with the patient’s care, treatment, and services.
- Before administering a new medication, the patient or family is informed about any potential clinically significant adverse drug reactions or other concerns regarding administration of a new medication.

IV. Special medication considerations

A. High alert medications

High alert medications are those that have a heightened risk of causing significant harm when they are used in error. Mistakes involving high alert medications may or may not be more common than mistakes involving other medications, however, the consequences can be devastating. The Los Angeles County Department of Health Services Medication Safety Committee has identified a list of standardized core high alert medications (Table 4). The list of high alert medications at each facility may differ, but each list must include, at a minimum, the medications listed in Table 4.
Strategies to prevent errors involving high alert medications must be implemented throughout a healthcare organization. Although the exact strategy is facility dependent one common nursing strategy employed with high alert medications is use of an independent double check. (Check with your facility for a specific list of medications that require independent double check). Double checks work best when performed independently. This means that the licensed nursing staff performing the double check must not have cues from the other nurse as to the correct answer. Steps for performing an independent double check are described in Table 5.

Table 5. Procedure for Performing Independent Double Check

Two RNs independently:
- Compare the medication and label with the order
- Use two patient identifiers to verify patient
- Perform and verify dose calculations (if calculations are involved)
- Assure accuracy of infusion pump programming (if administering via infusion pump)
- Verify that the dose is safe and appropriate for administration

The medication **SHOULD NOT BE** administered until both nurses agree.

B. The Black Box Warning (BBW)

A BBW is the strongest medication related warning issued by the Federal Drug Administration (FDA). The warning appears on the package insert and warns of serious adverse effects associated with the medication. More than 400 drugs carry a BBW. To make the list of drugs with a BBW more manageable, the Los Angeles County Department of Health Services Medication Safety Committee has identified a list of high priority medications for which each healthcare facility has developed healthcare provider specific actions to safeguard patient safety. Examples of high priority black box warning medications include:

1. Haloperidol (Haldol) – can result in sudden death, especially when given intravenously, or at higher doses than recommended.
2. Oxycodone (Oxycontin) – has a high abuse potential
3. Warfarin (Coumadin) – has a significant risk of bleeding
Licensed nursing staff must follow facility specific policy/procedure and be aware of the precautions related to the administration of medications with a BBW and be able to differentiate between high alert medications and medications with black box warnings. Some medications, such as heparin, fall into both categories!

C. Look Alike/Sound Alike (LASA) medications

“LOOK ALIKE” medications are defined as medications with similar written or physical appearance or packaging.

“SOUND ALIKE” medications are defined as medications with names that sound similar, and so are confused in verbal or written communication.

Together, these medications are often called “look alike/sound alike” medications. Each facility is required to maintain a list of LASA medications. Examples of LASA medications are in Table 6.

Table 6. Look Alike/Sound Alike (LASA) Medications

<table>
<thead>
<tr>
<th>Look Alike/Sound Alike (LASA) Medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBOplatin (antineoplastic)</td>
</tr>
<tr>
<td>clonAZEpam (anticonvulsant)</td>
</tr>
<tr>
<td>DAUNOrubicin (antineoplastic)</td>
</tr>
<tr>
<td>DOPAmine (adrenergic agent)</td>
</tr>
<tr>
<td>epheDRINE (bronchodilator)</td>
</tr>
<tr>
<td>foLIC acid (vitamin)</td>
</tr>
<tr>
<td>hydromorPHONE (narcotic analgesic)</td>
</tr>
<tr>
<td>hydrOXYzine (anti-histamine)</td>
</tr>
<tr>
<td>LAMIVudine (anti-retroviral)</td>
</tr>
<tr>
<td>LORazepam (benzodiazepine)</td>
</tr>
<tr>
<td>OxyCONTIN (brand name for the controlled release preparation of oxycodone)</td>
</tr>
<tr>
<td>sulfiSOXAZOLE (antibiotic)</td>
</tr>
<tr>
<td>VinBLASTine (antineoplastic)</td>
</tr>
</tbody>
</table>

Facility-specific policies/procedures must be followed to minimize the risk of error due to LASA medications. The following strategies are commonly used:

1. Awareness of look-alike and sound alike medication names.
2. Use of tall man lettering (e.g., hydrOXYzine, hydrALAZINE) on medication labels, medication administration records, pump labels, etc. Tall man lettering refers to the use of upper and lower case letters in the medication name to distinguish between look alike and sound alike medications.
3. Separation of LASA medications in storage areas, automated dispensing cabinets (e.g., Pyxis), and medication carts.
4. Education of inpatients to question nurses about medications that are unfamiliar or look or sound different than expected.

5. Inclusion of the indication for use when prescribing LASA medications.

D. Labeling of medications

TJC requires that all medications, medication containers (e.g., syringes, medicine cups, basins) or other solutions on and off the sterile field should be labeled. Medications or other solutions in unlabeled containers are unidentifiable).

1. Medications and solutions both on and off the sterile field are labeled even if there is only one medication being used.

2. Labeling occurs when any medication or solution is transferred from the original packaging to another container.

3. Medication labels include the following:
   - Medication name
   - Strength
   - Quantity
   - Diluent and volume (if not apparent from container)
   - Preparation date
   - Expiration date when not used within 24 hours*
   - Expiration time when expiration occurs in less than 24 hours*

   *NOTE: Date and time are not necessary for short procedures, as defined by the facility.

4. All medication or solution labels are verified both verbally and visually by two qualified individuals whenever the person preparing the medication or solution is not the person who will be administering the medication.

5. No more than one medication or solution is labeled at one time.

6. Any medications or solutions found unlabeled are immediately discarded.

7. All original medication or solution containers should remain available for reference in the perioperative or procedural area until the conclusion of the procedure.

8. All labeled containers on the sterile field are discarded at the conclusion of the procedure.

9. At shift change or break relief, all medications and solutions both on and off the sterile field and their labels are reviewed by entering and exiting personnel.

E. Safe Opioid Use

1. Definition: An **opioid** is a psychoactive chemical that works by binding to opioid receptors, which are found principally in the central and peripheral nervous system and the gastrointestinal tract.

2. The analgesic (painkiller) effects of opioids are due to decreased perception of pain, decreased reaction to pain, as well as increased pain tolerance.
3. Adverse drug effects:

- Opioid analgesics are frequently associated with adverse drug events
- Respiratory depression is the most serious adverse effect
- Other common adverse effects are:

<table>
<thead>
<tr>
<th>Nausea</th>
<th>Drowsiness</th>
<th>Itching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry mouth</td>
<td>Miosis</td>
<td>Confusion</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>Urticaria</td>
<td>Hypothermia</td>
</tr>
<tr>
<td>Dizziness</td>
<td>Falls</td>
<td>Vomiting</td>
</tr>
<tr>
<td>Constipation</td>
<td>Sedation</td>
<td>Delirium</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>Tachycardia</td>
<td>Hypotension</td>
</tr>
<tr>
<td>Bradycardia</td>
<td>Orthostatic</td>
<td>Hypotension</td>
</tr>
<tr>
<td>Headache</td>
<td>Flushing</td>
<td>Aspiration pneumonia</td>
</tr>
<tr>
<td>Euphoria</td>
<td>Urinary retention</td>
<td>Cough suppression</td>
</tr>
<tr>
<td>Dependency</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Adverse effects can occur with the use of any opioid
- Lack of knowledge regarding potency differences among opioids, improper prescribing and administration of multiple opioids, routes of administration, and inadequate monitoring can cause adverse events

4. Patient safety considerations to help prevent opioid adverse effects:

- Assess for respiratory depression risk
- Assess history of analgesic use or abuse, duration of use, and side effects
- Complete skin assessment prior to administration of a new opioid to rule out other use of opioids (i.e., patch, implanted delivery system, or infusion pump)
- Initiate a plan of care which includes psychological support, coordination of care, promotion of health behaviors, non-pharmacological approaches, and non-opioid pain medications
- Implement safeguards if patient is new to opioids or is being restarted on them; use lowest effective dosages to start and assess tolerance prior to increasing
- Collaborate with pharmacy or a pain management expert before converting from one opioid to another or changing the route
- Avoid rapid escalation of dosages above routine dose levels in opioid tolerant patients
- Ensure continuity of care upon transfer or discharge
- Monitor oxygen levels and respiratory rate of patients postoperatively
- Identify adverse drug reactions and advancing sedation and revise care plan accordingly

5. Equianalgesic Dosing Conversion

- Equianalgesic conversion tables are used to determine comparable dosing requirements between oral and parenteral routes of a single opioid medication and/or between different opioid medications to improve pain control/ decrease adverse drug effects.
- When considering using dosing conversion tables, healthcare professionals should be mindful of the fact that individual response to opioids may vary and that age and co-existing conditions, such as renal, liver, or pulmonary disease, must be considered when administering opioids.
- The amount of residual drug in the patient’s system from previous opioids should be taken into consideration. (e.g., a fentanyl patch will continue to release medication from the skin 12-36 hours after discontinuing the patch). Additionally, residual
effects from a long acting or prolonged release opioid should be taken into consideration when converting a patient to a new drug.

- A high dose of an opioid that was not effective in controlling pain may lead to an overestimation of the dose needed during conversion of a newly ordered medication.
- Meperidine should only be used to treat acute pain due to its short half-life and toxic metabolite: normeperidine. Additionally, it should be used cautiously in patients with chronic diseases, such as renal or liver impairment. The dose should not exceed 600 mg/day.
- A number of conversion tables exist with slight variation in dosing recommendations. However, the main principle to remember, regardless of which table is used, is that different medications as well as a single medication given via varying routes are not equal mg for mg in terms of the amount of analgesic administered. Dosages must be adjusted appropriately using a valid and reliable equianalgesic conversion table, such as the equianalgesic table found in Micromedex located on your facility’s intranet.

F. Safe Use of Patient Controlled Analgesia (PCA) Pumps

PCA is a commonly used method for administering pain medications. Although PCAs are typically an effective and efficient way to control pain, they can also be dangerous if not used properly. PCA “by proxy”, one of the biggest patient safety issues related to PCA delivery, refers to PCA administration by someone other than the patient on their behalf. The Joint Commission has received reports of hundreds of these errors and, as a result, has made the following recommendations:

- Teach patients and family and provide written instructions about the proper use of PCA pumps
- Follow criteria for identifying PCA candidates
- Inform staff about the patient safety risks associated with administering PCA “by proxy”
- Monitor patients closely (see “Safe Opioid Use” above for specific risks/side effects)
- Place warning labels on the patient control button of the PCA pump, stating, “Only patients should press the button.”

Department of Health Services (DHS) has developed written patient and family instructions to address these issues. The instructions remind family and friends that only the patient may press the PCA button. In addition, the instructions teach family and friends that too much pain medication can lead to death, and that therefore they should pay attention to how the patient is feeling or if the patient is experiencing any of the signs and symptoms discussed in the handout. They are also asked to report any abnormal changes to the nurse right away.

Hopefully, increased emphasis on patient and family education, as well as steps such as placing a label on the PCA button to remind everyone that only the patient can press the button, will lead to a significant decrease in the number of adverse events related to PCA administration.

G. Pre-Medication and Post-Medication Assessment

Medications are made of chemicals and/or biological agents that are intended to be used to treat illness(es) or alleviate pain. However, not all patients react/respond to medications in the same manner. It is possible for the medications to have a detrimental effect. The standard of care when giving medications is to perform a pre-medication and post-medication assessment. Nurses are responsible for knowing the implications of medication administration and applying critical thinking to support positive outcomes and to reduce the risk of adverse events.

A pre-medication assessment requires nurses to collect information necessary for effective planning and implementation of care, as well as to gather baseline data. Pre-medication
assessment, at a minimum, requires gathering vital signs (VS) or physical/psychosocial assessment relevant to the medications being administered. Also, be aware of medications that are known to cause problems like bronchospasm, rash, flushing, or mental status changes. Check for these findings before giving the medication so any changes can be identified. Include an assessment of the patient’s IV access status and patency as appropriate. Some medications cause side effects that may require an IV access for rapid resuscitation. For example, if an antihypertensive medication is to be given, VS (especially the blood pressure) should be obtained and recorded. In addition, the patient’s mental status should be assessed as some antihypertensives can cause dizziness and/or drowsiness (alpha blockers, beta blockers and central alpha agonists).

A post-medication assessment should be performed and documented to evaluate the effect of the medication on the patient. Assessment parameters used during pre-assessment should be collected. This will help in evaluating of the efficacy of the medications administered.

H. Pain Assessment and Reassessment

Although it is prudent for a nurse to perform assessment before and after administration of all medications, pain medications are prone to regulatory/accreditation body citation if there is no proper follow-up. Some points to remember:

- If a medication is being given to alleviate pain, the pain score of the patient should be evaluated. NOTE: The nurses should use the appropriate pain screening/assessment tool.
- Pain pre-assessment includes the location of the pain. However, the patient’s mental status and vital signs should be assessed as some pain medications may alter the patient’s mentation or respiratory status.
- Check the physician’s PRN order for pain indication and follow as ordered. Do not assume that the order applies for overall pain.

  - Example 1: If a pain medication is ordered to be given for a pain score of 4-7 but the patient’s reported pain score is 10, do not give the pain medication. Contact the physician to obtain a pain medication order.
  - Example 2: Provider ordered Acetaminophen (Tylenol) for fever. Even though this medication can also reduce pain, do not administer if the patient is complaining of pain. Contact the provider to obtain another order for pain.

- ALWAYS document pain assessment before and after pain medication administration to indicate its effectiveness (or ineffectiveness).

NOTE: In ORCHID, most pain medications generate a task immediately after administration of the medication.

I. Hypoglycemia

Hypoglycemia is defined as a blood sugar value of <70 mg/dl. Hypoglycemia is not an uncommon occurrence in hospitals but is considered a “never event.” A never event is an adverse event that is clearly identifiable and measurable, serious (resulting in death or significant disability), and usually preventable. Hypoglycemia results in increased hospital stay and contributory to patient’s mortality. Some of the causes why a patient becomes hypoglycemic include:
• Dose of mealtime insulin was administered but patient did not consume enough carbohydrates.
  ➢ Patient’s PO intake may have decreased. Always assess the patient’s meal consumption.
  ➢ Patient is on NPO for procedure, surgery, or other medical reasons.
  ➢ TPN or tube feeding is held or the rate was decreased

• SQ insulin may have been given too early. Patients need to eat within 30 minutes or immediately (depending on the type of insulin)
• The wrong type/dose of insulin was administered.
• Patient's dose of steroids was reduced. Steroids increases blood sugar. If the steroid dose is tapered and insulin was given without consideration of change in dosing, the patient may develop hypoglycemia.

To prevent hypoglycemia, always use the latest glucose level (one that is obtained within 30 minutes) before an insulin dose is given. For example, for patients who are eating, the order is for the patient to get insulin before each meal. If the meal tray arrives at 0830, the day shift staff need to obtain another glucose level at least within 30 minutes before giving the insulin and NOT base the insulin dose on the 0600 glucose result (if drawn or sent).

A. Nursing interventions

• Notify the physician if the patient’s food/glucose intake changes (e.g., missed meals, NPO, tube feeding held, TPN held, patient has nausea and vomiting) while on insulin therapy. Insulin dose may need to be held or modified or an intravenous dextrose infusion may be needed.

• Monitor the patient for signs and symptoms of hypoglycemia (e.g., anxious feeling, change in behavior, blurred vision, cold sweats, confusion, dizziness, excessive hunger, fast heartbeat, headache, restlessness, shakiness and tingling in the hands, feet, lips or tongue).

• Give a fast-acting sugar source as ordered. Example: Oral- orange juice or non-diet soft drink(4oz), IV- Dextrose 50%, Intramuscular injection- Glucagon.

• Recheck the blood glucose in 15 minutes and repeat if the blood glucose is < 70mg/dl. This will determine if the patient will require further treatment. Example: Oral- orange juice or non- diet drink (4oz), IV-Dextrose 50%, Intramuscular-Glucagon.

• Monitor the patient for signs and symptoms of hyperglycemia (e.g., drowsiness, flushed dry skin, fruit-like breath odor, and frequent urination, loss of appetite, tiredness, and unusual thirst).

VI. Conclusion

There are many strategies that nurses may use to promote patient safety throughout the medication administration process. Safe medication practices are a nursing responsibility and important aspect of patient safety. Institutions must look at the human factors involved in the medication administration process and take measures to improve the process to promote safety. In addition, a well-informed patient plays a crucial role in medication safety.

PLEASE COMPLETE THE STUDY QUESTIONS ON NEXT PAGE
MEDICATION SAFETY
Study Questions

Select the best answer to each question.

1. Which practice is vital to ensure patient safety during medication administration?
   a. Observing hand hygiene only after administering medications
   b. Inserting the needle in the IV tubing needleless port
   c. Using a medication packaged as single-dose or single-use for just one patient
   d. Check the patient’s ID band only after giving a patient his/her medication

2. Which of the following is an acceptable order?
   a. Diphenhydramine 50 mg IV PRN
   b. Lovenox 30 mg subcutaneously daily
   c. Regular insulin 10 units BID
   d. 2 MS Contin every 4 hours PRN pain

3. Which of the following is part of the current eight rights of medication administration?
   a. Right reason
   b. Right volume
   c. Right unit
   d. Right arm

4. Which of the following is acceptable to use?
   a. mL
   b. .5 mg
   c. MgSO4
   d. IU

5. A medication order is written as “URGENT”. Initiation of medication administration is to occur within how many minutes?
   a. 5 minutes
   b. 15 minutes
   c. 60 minutes
   d. 120 minutes

6. Which of the following medications can be crushed?
   a. A capsule
   b. A scored solid tablet
   c. An extended-release capsule
   d. An enteric coated tablet
7. Ibuprofen is an example of enteric coated medication. What is the purpose of coating medications?
   a. To make it easier to chew
   b. To slow its absorption
   c. To make it sweeter
   d. To prevent irritation of gastric mucosa

8. A patient has an order for Sucralfate via NGT at 0800. After the nurse crushes it, the nurse looks at the packaging prior to administering the medication and notes that the package is labeled Bactrim DS, an antibiotic ordered to be given at 1000. The nurse should:
   a. Complete an incident report in SI (Safety Intelligence reporting system)
   b. Ask the physician to change the order to Bactrim DS at 0800
   c. Not give crushed Bactrim DS and get the Sucralfate from the Pyxis
   d. Give the Bactrim DS early because it is ordered for the patient anyway

9. Clonazepan and Clonidine are examples of:
   a. High alert medications
   b. Time-release medications
   c. Look alike/sound alike medications
   d. The same medication made by different manufacturers

10. Which medication has a higher risk of causing significant harm when administered in error?
    a. Morphine (narcotic)
    b. Vitamin C tablet
    c. Aluminum hydroxide (antacid)
    d. Bacitracin topical ointment

11. What strategy is commonly used to prevent errors involving high alert medications?
    a. Making sure to check if they are scored
    b. All should have red warning labels
    c. Performance of an independent double check prior to administration
    d. Restricting the use of high alert medications to patients in ICUs

12. A medication with black box warning means which of the following?
    a. It is a warning for look-alike/sound alike medications
    b. The medication is associated with serious side effects
    c. It is an experimental drug
    d. Medications frequently involved in medication errors
13. If multidose insulin (Humulin) vial has been opened or punctured, the insulin vial must be discarded after how many days?
   a. 1 day
   b. 28 days
   c. 7 days
   d. 30 days

14. What is the reason a near-miss should always be reported?
   a. Identifying system problems
   b. Disciplining staff
   c. Collecting data to be submitted to Human Resources
   d. Identifying which medications should be added to the high alert medication list

15. Which of the following is an adverse effect of an opioid?
   a. Hyperactivity
   b. Respiratory depression
   c. Hypoxia
   d. Hypertension

16. A nursing strategy to administer a medication safely to a patient includes:
   a. Checking medication label after the medication is administered
   b. Relying on the patient to identify himself/herself by name only
   c. Assessing allergy status before administering any medication
   d. Accepting unapproved abbreviations only for URGENT medications

17. During PCA administration, which of the following must be implemented?
   a. Teach the patient keep on pressing the button when in pain
   b. Encourage the family to press the control button to help the patient fall asleep
   c. Tape the control button to prevent the nurse and patient from pressing it
   d. Provide the patient and family written instruction about how to use PCA pumps properly

18. A diabetic patient is on NPO for surgery at 0800. According to the shift report, the patient received 4 units of regular insulin per sliding scale for a blood glucose level of 0600. What should you do?
   a. Nothing. The patient received care as ordered.
   b. Remind the OR staff that the patient is diabetic
   c. Wait to recheck the blood sugar after surgery
   d. Monitor patient for potential hypoglycemia.
19. What is the relevance of collecting pre-assessment data before medication administration?

a. It gives baseline information on the status of the patient
b. It is a standard nursing practice
c. It provides information to make a decision to administer the medication or not
d. All of the above

Answers to Study Questions


If you answered all of the questions correctly, go on to the next section. If you missed one or more, read the content again and repeat the study guide questions.
MEDICATION CALCULATION

Objectives:

Upon completion of this section, the workforce employee will be able to:

1. Identify metric units of measurement commonly used in dosage calculation of oral and parenteral medications
2. State common equivalents in the metric system that are used for medication administration
3. Convert metric weights and volumes within the metric system
4. Express metric weights and volumes using correct notation rules
5. Describe the use of milliequivalents (mEq), units, and percentages (%) in dosage calculation
6. Use one of the following methods, to accurately calculate medication dosages:
   
   \[
   \frac{D}{H} \times Q
   \]
   
   Ratio and proportion
   
7. Determine appropriateness of an ordered medication dosage based on recommendations from the literature.

I. Introduction

This competency will focus on the dosage calculation of oral and parenteral medications. This competency will review medication measurement systems most commonly encountered in the clinical setting. Two common formulas for dosage calculations are presented for use in working through the practice problems.

II. Systems of medication measurements

A. Metric system

The metric system is the most commonly used system of measurement for prescribing and administering medications. The metric system is a decimal system based on multiples of ten. Numbers to the left of the decimal are whole numbers and numbers to the right of the decimal are fractions of whole numbers. Each number has a place value. The value of each place is ten times the value of the place immediately to its right.

The first number after the decimal point is the tenth place.
0.1 is read as one tenth (1/10).

The second number after the decimal point is the hundredth place.
0.01 is read as one hundredth (1/100).

The third number after the decimal point is the thousandth place.
0.001 is read as one thousandth (1/1000).

Because each place is a multiple of ten, moving a decimal point one place produces a 10-fold change in the number. A medication error involving a misplaced decimal point can result in serious under or overdosages of a medication.

For example, if a nurse gives 12 mL of a medication instead of 1.2 mL, the patient will receive 10 times the dose.
The metric system has three basic units of measure: meter (length), liter (volume), and gram (weight). Metric units important in dosage calculation are the liter (L) and the gram (gm). Common prefixes are used to indicate the value of each unit of length, volume, or weight.

The following indicate smaller parts than the basic unit of measure:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Value</th>
<th>Decimal Equivalent</th>
<th>Relationship to Basic Unit (meter, liter, gram)</th>
</tr>
</thead>
<tbody>
<tr>
<td>deci</td>
<td>one tenth</td>
<td>0.1</td>
<td>10 times smaller</td>
</tr>
<tr>
<td>centi</td>
<td>one hundredth</td>
<td>0.01</td>
<td>100 times smaller</td>
</tr>
<tr>
<td>milli</td>
<td>one thousandth</td>
<td>0.001</td>
<td>1,000 times smaller</td>
</tr>
<tr>
<td>micro</td>
<td>one millionth</td>
<td>0.000001</td>
<td>1,000,000 times smaller</td>
</tr>
</tbody>
</table>

One prefix indicates a larger unit than the basic unit of measure:

kilo = one thousand = 1000.0 = 1000 times greater

It is helpful to memorize some of the common metric unit abbreviations and their equivalents used in clinical dosage calculations (Table 1).

Table 1. Metric Equivalents.

<table>
<thead>
<tr>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kilogram (kg) = 1000 grams (gm)</td>
</tr>
<tr>
<td>1 gram (gm) = 1000 milligrams (mg)</td>
</tr>
<tr>
<td>1 milligram (mg) = 1000 micrograms (mcg)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VOLUME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 liter (L) = 1000 milliliters (mL)</td>
</tr>
<tr>
<td>or 1000 cubic centimeters (cc)*</td>
</tr>
<tr>
<td>1 milliliter (mL) = 1 cubic centimeter (cc)</td>
</tr>
</tbody>
</table>

*The cubic centimeter (cc) is the amount of space that 1 mL occupies. The two measures are interchangeable, but mL is the preferred abbreviation.

As shown above, each of the common units of measure used in dosage calculations differs from the next by 1000. Since each place is a multiple of ten, and each zero represents one place value, to convert between these units of measure the decimal point is moved three places. The direction the decimal point is moved is dependent on whether the value is moving down to a smaller unit of measure or moving up to a larger unit of measure. If moving down in value, the quantity becomes larger so the decimal point is moved three places to the right (Table 2). If moving up in value, quantities become smaller and the decimal point is moved three places to the left (Table 3). Being able to convert these common units is important when calculating dosages.
Table 2. Moving Down in Value: Example.

<table>
<thead>
<tr>
<th>0.5 gm is equivalent to how many milligrams?</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 gm</td>
</tr>
</tbody>
</table>

We converted down the scale. Milligrams are a smaller unit of measure than grams. To convert grams to milligrams, move the decimal point three places to the right and change the units to milligrams. In order to do this, two zeros must be added.

Another method to convert grams (large) to milligrams (small) is to multiply by 1000.

0.5 gm \times 1000 = 500 mg

Table 3. Moving Up in Value: Example.

<table>
<thead>
<tr>
<th>2500 mL is equivalent to how many liters?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2500 mL</td>
</tr>
</tbody>
</table>

We converted up the scale. A liter is a larger unit of measure than a milliliter. To convert mL to L, move the decimal point three places to the left and change the units to L. Once done, it is possible to drop two zeros as retaining them does not change the value.

Another method to convert milliliters (small) to liters (large) is to divide by 1000.

2500 mL \div 1000 = 2.5 L

NOTE: Errors in metric system dosage calculations occur more frequently when the dosage contains a decimal. Whenever possible, perform the conversions to eliminate the decimal point. It is also important to ALWAYS place a zero in front of decimal fractions (Table 4).

Table 4. Proper Notation.

| .3 mg is an improper notation |
| 0.3 mg is the correct notation |

B. Other systems of medication measurements

**Units** - Medications are sometimes measured in units. A unit measures a medication in terms of its action rather than its weight. There are three major medications measured in units: heparin, penicillin, and insulin.

**Milliequivalents** - Milliequivalents (mEq) are the number of grams of a medication contained in a mL of solution. Milliequivalents are used to designate measurement in a variety of solutions, especially electrolytes.

**Percentage** - Percentages (%) are parts per hundred. Specifically, percentages represent the number of grams of medication per 100 mL of solution.
The higher the percentage strength, the stronger the mixture. Percentages, as a unit of measure, are used in solutions, topical ointments and other medications. Refer to Table 5 for instructions on how to change from a percent to a fraction. The following illustrates the concentration of medications expressed as percentages:

\[
\begin{align*}
\text{Lidocaine 2\%} & \quad = \quad 2 \text{ gm of medication per 100 mL of solution} \\
\text{D}_{10}\text{W} & \quad = \quad 10 \text{ gm of dextrose per 100 mL of water}
\end{align*}
\]

Notice that the denominator is always 100 and the numerator shows how many parts out of 100.

Table 5. Changing Percent (\%) to Fraction.

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Drop the % sign.</td>
</tr>
<tr>
<td>2.</td>
<td>Write the number as the numerator.</td>
</tr>
<tr>
<td>3.</td>
<td>Write 100 as the denominator.</td>
</tr>
<tr>
<td>4.</td>
<td>Reduce to lowest terms</td>
</tr>
</tbody>
</table>

**EXAMPLE:**

Dextrose 5\% = \frac{5 \text{ gm}}{100 \text{ mL}} = \frac{1 \text{ gm}}{20 \text{ mL}}

**PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE**

**NOTE:** Calculation questions on the Medication Calculation clinical competency test will be multiple choice. You may use a calculator when completing the test. Metric equivalencies and dimensional analysis formula will be provided.
MEDICATION CALCULATION
Study Questions - Metric Units of Measure and Equivalents

Complete the following questions.

1. How many milliliters (ml) are in a liter (L)? __________

2. How many micrograms (mcg) are in a milligram (mg)? __________

3. Which is smaller?
   a. mL
   b. L

4. Which is larger?
   a. mcg
   b. gm

5. What is the concentration of Dextrose 50%?
   a. 50 Grams Dextrose/100 mL
   b. 5 Grams Dextrose/10 mL
   c. 50 Grams Dextrose/1000 mL
   d. 50 Grams Dextrose/mL

Convert the following metric measures:

6. 1200 mL = _________ L

7. 500 mg = ___________ gm

8. 8 kg = ______________gm

9. 0.5 gm = ____________mg

10. 20 mg = ____________mcg

11. 300 mcg = __________ mg

12. 500 cc = _____________mL

13. 0.5 L = _____________mL

14. 1.2 mg = ___________ mcg

15. 1500 mg = __________ gm

16. 0.08 gm = __________ mg

PLEASE CHECK YOUR ANSWERS TO THE STUDY QUESTIONS ON NEXT PAGE
MEDICATION CALCULATION
Answers to Study Questions - Metric Units of Measure and Equivalents

1. 1000 mL
2. 1000 mcg
3. a
4. b
5. a
6. 1.2 L
7. 0.5 gm
8. 8000 gm
9. 500 mg
10. 20,000 mcg
11. 0.3 mg
12. 500 mL
13. 500 mL
14. 1200 mcg
15. 1.5 gm
16. 80 mg

If you answered all of the questions correctly, go on to the next section. If you missed one or more, read the content again and repeat the study guide questions.
III. Dosage calculations

*Tablets* and *capsules* each contain a specific amount of medication (Table 6). Most tablets and capsules come in multiples of the ordered dosage. When necessary, scored tablets may be divided. Most orders require giving ½ to 3 tablets. If a nurse’s calculation results in an unusual number, this could be a warning that a calculation mistake has been made. *Liquid* medication preparations contain a specific amount of medication in a certain volume of solution.

When the dosage ordered is different from what is available, dosage calculations are necessary. There are several different ways to calculate medication dosages. The following section will present two common methods of dosage calculations for preparing oral and parenteral medications, dimensional analysis and ratio and proportion. Practice the medication calculations using each method presented. Then select one method and work the study questions.

A. Medication calculations using dimensional analysis

Dimensional analysis is a method to calculate medication doses using fractions (Table 7) with dimensional analysis, the problem is set up according to the following:

\[
\frac{D}{H} \times Q = X
\]

*D* represents the desired dosage or what the physician has ordered

*H* represents the dosage on hand or the strength available

*Q* represents the quantity that contains the available dose

*X* represents the volume desired and is the unknown value.

*If the problem involves tablets the Q is always 1 and therefore can be eliminated from the equation (e.g., 250 mg/tablet). However, when solving for medication in solution, the Q amount varies (e.g., 250 mg/5 mL) and must be included in the equation.*

<table>
<thead>
<tr>
<th>Table 6. Medication Preparations: Example.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One medication may come in a tablet and liquid preparation.</strong></td>
</tr>
<tr>
<td><strong>Tablet</strong> = 250 mg tablet</td>
</tr>
<tr>
<td><strong>Liquid</strong> = 250 mg/5 mL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 7. Steps to Calculate Medication Dosages Using Dimensional Analysis.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ensure all units are in the same size. Convert if necessary in a manner that will eliminate the decimal point. When converting be sure to convert to the units of the available medication.</td>
</tr>
<tr>
<td>2. Estimate what would be a reasonable amount to administer.</td>
</tr>
<tr>
<td>3. Place all the information into the correct position in the formula.</td>
</tr>
<tr>
<td>4. Calculate the answer.</td>
</tr>
</tbody>
</table>
**EXAMPLES: Medication Calculations Using Dimensional Analysis**

**Order:** 600 mg p.o.  
**Available:** 300 mg tablets

*Step 1:* Units are already in the same size (mg), no conversion is necessary.

*Step 2:* A reasonable estimate is that more than 1 tab will be given because the dosage ordered is larger than the dosage on hand.

*Step 3:*  
\[
\begin{array}{c}
(D) \quad 600 \text{ mg} \\
(H) \quad 300 \text{ mg}
\end{array}
\times \quad \begin{array}{c}
(Q) \quad 1 \text{ tab} \\
\end{array} = \quad X
\]

*Step 4:*  
\[
\begin{array}{c}
600 \text{ mg} \\
300 \text{ mg}
\end{array}
\times \quad \begin{array}{c}
1 \text{ tab} \\
\end{array} = \quad 2 \text{ tabs}
\]

**Order:** 0.025 mg p.o.  
**Available:** 50 mcg scored tablets

*Step 1:* Convert to like units. Convert mg to mcg, to eliminate the decimal point. To do this, multiply by 1000 OR move the decimal point 3 places to the right and change units to mcg: 0.025 mg = 25 mcg.

*Step 2:* A reasonable estimate is that less than 1 tab will be given because the dosage ordered is less than the dosage on hand

*Step 3:*  
\[
\begin{array}{c}
(D) \quad 25 \text{ mcg} \\
(H) \quad 50 \text{ mcg}
\end{array}
\times \quad \begin{array}{c}
(Q) \quad 1 \text{ tab} \\
\end{array} = \quad X
\]

*Step 4:*  
\[
\begin{array}{c}
25 \text{ mcg} \\
50 \text{ mcg}
\end{array} = \quad \frac{1}{2} \text{ tab}
\]

**Order:** 50 mEq p.o.  
**Available:** 20 mEq/15 mL

*Step 1:* Units are already in the same size, no conversion is necessary.

*Step 2:* A reasonable estimate is that more than 15 mL will be given because the dosage ordered is more than the dosage on hand

*Step 3:*  
\[
\begin{array}{c}
(D) \quad 50 \text{ mEq} \\
(H) \quad 20 \text{ mEq}
\end{array}
\times \quad \begin{array}{c}
(Q) \quad 15 \text{ mL} \\
\end{array} = \quad X
\]

*Step 4:*  
\[
\begin{array}{c}
50 \text{ mEq} \\
20 \text{ mEq}
\end{array}
\times \quad \begin{array}{c}
15 \text{ mL} \\
\end{array} = \quad \frac{75}{2} = \quad 37.5 \text{ mL}
\]
B. Medication calculations using ratio and proportion method

A ratio is a comparison of two numbers which are somehow related to each other. A medication dosage ratio can be used to show the amount of medication contained in one tablet. A dosage ratio can also be used to show the amount of medication in a given volume of solution. These relationships (ratios) are expressed by either placing a colon between the numbers or writing the numbers in fraction form (Table 8).

Table 8. Expression of a Ratio.

A medication is available in a dose of 250 mg per 5 mL. The ratio is expressed as:

\[
5 \text{ mL : } 250 \text{ mg or } \frac{5 \text{ mL}}{250 \text{ mg}}
\]

A proportion is used to prove that two ratios are equal (Tables 9 and 10). A proportion may be separated by an equal sign (=) or double colon (::).

Table 9. Expression of a Proportion - Written as Fraction.

\[
\frac{250}{1} = \frac{500}{2}
\]

Read as 250 is to 1 as 500 is to 2

Table 10. Expression of a Proportion - Written as Ratio.

\[
250 : 1 :: 500 : 2
\]

Read as 250 is to 1 as 500 is to 2

The middle numbers in a proportion are called the “means”, and the two outer numbers are called the “extremes”.

Proof of the ratios in a proportion being equal is demonstrated by cross multiplication. When expressed as a fraction, the numerator (top number) of each ratio is multiplied by its opposite denominator (bottom number). When expressed as a ratio, the inside numbers are multiplied, then the outside numbers are multiplied. The products in a true proportion are equal. In the above example in Table 9, the product (answer) of the numerator in the ratio on the left "250" multiplied by the denominator in the ratio on the right "2" is "500". The product of the numerator in the ratio on the right "500" multiplied by the denominator in the ratio on the left "1" is "500". Thus, these ratios are equal. In Table 10, proof of the ratios being equal is evident by multiplying the means (1 X 500 = 500) and multiplying the extremes (250 X 2 = 500).

Ratio and proportion can be used to calculate dosages when only one complete ratio is known and the second is incomplete (Table 11). If three numbers of the two ratios are known, the fourth can be determined. In the ratio and proportion method of dosage calculation, the unknown number is represented by X. When setting up a proportion, remember the following key points:

- Ratio for known equivalent = ratio for unknown equivalent. Keep the “known” information on the left.
Set up the equation according to the following:

*If using fractions, set up like this:*

\[
\frac{\text{dosage on hand}}{\text{amount on hand}} = \frac{\text{dosage desired}}{\text{amount desired}} (X)
\]

*If using ratio, set up like this:*

\[
\text{dosage on hand} : \text{amount on hand} : \text{dosage desired} : \text{amount desired} (X)
\]

Label the units and make sure the units in the numerators match and the units in the denominators match.

**Example (fraction):**

\[
\begin{array}{c}
\text{Order: 150 mg} \\
\text{Available: 100 mg/2 mL}
\end{array}
\]

\[
\frac{100 \text{ mg}}{2 \text{ mL}} = \frac{150 \text{ mg}}{x \text{ mL}}
\]

**Example (ratio):**

\[
\begin{array}{c}
\text{Order: 150 mg} \\
\text{Available: 100 mg/2 mL}
\end{array}
\]

\[
100 \text{ mg} : 2 \text{ mL} : 150 \text{ mg} : x \text{ mL}
\]

**Table 11.** Steps to Calculate Medication Dosages Using Ratio and Proportion Method.

1. Ensure all units are in the same size, converting if necessary. When converting be sure to convert to the units of the available medication.
2. Estimate what would be a reasonable amount to administer.
3. Set up the problem as a proportion.
4. Calculate the answer by multiplying and solving for X.

Using the same example sets used to demonstrate the formula method, ratio and proportion will now be used to calculate medication dosages.
EXAMPLES: Medication Calculations Using Ratio & Proportion Method

**Order:** 600 mg p.o.  
**Available:** 300 mg tablets

**Step 1:** No conversion necessary

**Step 2:** A reasonable estimate is that more than 1 tab will be given because the dosage ordered is more than the dosage on hand.

**Step 3:**

<table>
<thead>
<tr>
<th>300 mg</th>
<th>=</th>
<th>600 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 tab</td>
<td>X tabs</td>
<td></td>
</tr>
</tbody>
</table>

**Step 4:** Cross multiply, keeping X on the left side of the equation

\[
\frac{300\text{ mg}}{1\text{ tab}} \cdot \frac{X\text{ tabs}}{600\text{ mg}} = \frac{300X}{600}
\]

Solve for X by dividing the number on the right side of the equation by the number in front of X.

\[
\frac{300X}{300} = \frac{600}{300}
\]

\[X = 2\text{ tabs}\]

Same problem, but in this example, the equation is set up using ratios (NOTE: this is the only example in which solving ratio and proportion by setting up the equation using ratios is described)

**Step 1:** No conversion necessary

**Step 2:** A reasonable estimate is that more than 1 tab will be given because the dosage ordered is more than the dosage on hand.

**Step 3:**

\[300 : 1 :: 600 : X\]

**Step 4:** Multiply means and extremes

\[
300X = 600
\]

Solve for X by dividing the number on the right side of the equation by the number in front of X.

\[
\frac{300X}{300} = \frac{600}{300}
\]

\[X = 2\text{ tabs}\]
Order: 0.025 mg p.o.  
Available: 50 mcg scored tablets

Step 1: Convert to like units. To convert mg to mcg, move the decimal point 3 places to the right and change the units to mcg: 0.025 mg = 25 mcg

Step 2: A reasonable estimate is that less than 1 tab will be given because the dosage ordered is less than the dosage on hand.

Step 3: \[
\frac{50 \text{ mcg}}{1 \text{ tab}} = \frac{25 \text{ mcg}}{X \text{ tab}}
\]

Step 4: Cross multiply and solve for X

\[
50X = 25 \\
\frac{50X}{50} = \frac{25}{50} \\
X = 0.5 \text{ or } \frac{1}{2} \text{ tab}
\]

Order: 50 mEq p.o.  
Available: 20 mEq/15 mL

Step 1: Units are already in the same size, no conversion is necessary.

Step 2: A reasonable estimate is that more than 15 mL will be given because the dosage ordered is more than the dosage on hand.

Step 3: \[
\frac{20 \text{ mEq}}{15 \text{ mL}} = \frac{50 \text{ mEq}}{X \text{ mL}}
\]

Step 4: Cross multiply and solve for X

\[
\frac{20 \text{ mEq}}{15 \text{ mL}} = \frac{50 \text{ mEq}}{X \text{ mL}} \\
20X = 750 \\
\frac{20X}{20} = \frac{750}{20} \\
X = \frac{37.5}{1} \text{ mL}
\]
C. Dosages based on body weight

Body weight is a factor in calculating medication dosages. Most patients state their body weight in pounds, however most drug sources state dosages in terms of mcg/kg or mg/kg. This section of the competency will review how to convert lbs and kgs and offer examples of calculating dosages based on weight.

1. Equivalency: 1 kg = 2.2 lb

2. Conversions between pounds and kilograms can be accomplished using multiplication and division or the ratio and proportion method

   a. Multiplication/Division
      - To convert from lb to kg, divide the number of lb by 2.2.
      - To convert from kg to lb, multiply the number of kg by 2.2.

   b. Ratio and proportion
      - Set up the problem as a proportion, using the equivalency above.
      - Solve for the unknown.

   c. Regardless of method, round the answer to the nearest tenth.
      - Exception: When converting pounds to kilograms in neonates, round to the nearest thousandth.

Table 12. Converting Pounds & Kilograms

<table>
<thead>
<tr>
<th></th>
<th>Convert 60 lbs to kg</th>
<th>Convert 15 kg to lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Division method:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 divided by 2.2 = 27.3 kg</td>
<td></td>
<td>15 X 2.2 = 33.0 = 33 lb</td>
</tr>
<tr>
<td><strong>Ratio and proportion method:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 lb = 60 lb</td>
<td>1 kg = 15 kg</td>
<td></td>
</tr>
<tr>
<td>2.2X = 60</td>
<td>2.2 lb = X lb</td>
<td></td>
</tr>
<tr>
<td>X = 27.27 kg</td>
<td>X = 33 lb</td>
<td></td>
</tr>
<tr>
<td>X = 27.3 kg</td>
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</tbody>
</table>
EXAMPLE: Calculation of Medication Dosages based on Body Weight

Order: 20 mg/kg

Patient Weight: 176 lb

How many grams of medication will you administer?

1. **Convert lb to kg**

   \[
   \frac{2.2 \text{ lb}}{1 \text{ kg}} = \frac{176 \text{ lb}}{X \text{ kg}}
   \]

   \[
   2.2 \times X = 176
   \]

   \[
   X = 80 \text{ kg}
   \]

2. **Set up the problem using ratio/proportion**

   \[
   \frac{20 \text{ mg}}{1 \text{ kg}} = \frac{X \text{ mg}}{80 \text{ kg}}
   \]

   \[
   X = 1600 \text{ mg}
   \]

3. **Convert mg to gm**

   \[
   1600 \text{ mg} = 1.6 \text{ g}
   \]

   **PLEASE COMPLETE THE STUDY QUESTIONS ON NEXT PAGE**
MEDICATION CALCULATION

Study Questions - Dosage Calculations

Using either dimensional analysis \( \frac{D}{H} \times Q \) or the ratio and proportion method of dosage calculations, work the following problems. Include units in the answer.

1. 1000 units of medication are ordered to be given as a subcutaneous injection. Available is a vial containing 10,000 units per 1mL. How many mLs will the nurse administer?

2. Available is 500mg/5 mL syrup. The physician orders 0.25 gm p.o. How many mLs will the nurse administer?

3. 20 mEq of a liquid medication is ordered to be given p.o. Available is 30 mEq/15 mL. How many mLs will the nurse administer?

4. 300 mcg of medication is ordered. On hand is a liquid suspension of 0.06 mg/mL. How many mLs will the nurse administer?

5. 750,000 units of a medication is ordered IM. On hand is 250,000 units per mL. How many mLs will the nurse draw up?

6. Order: 100 mg
   Available: 50 mg scored tablet
   How many tablet(s) will the nurse administer?

7. Order: 10 mg/kg
   Pt. weight: 110 lbs
   How many GRAM(S) will the nurse administer?

8. Order: 75 mg
   Available: 15 mg/mL
   How many mLs will the nurse administer?

9. Order: 0.5 mg
   Available: 500 mcg/mL
   How many mLs will the nurse administer?

10. Order: 7.5 gm
    Available: 250 mg/mL
    How many mLs will the nurse administer?

PLEASE CHECK YOUR ANSWERS TO THE STUDY QUESTIONS ON NEXT PAGE
MEDICATION CALCULATION
Answers to Study Questions - Dosage Calculations

1. 0.1 mL
2. 2.5 mLs
3. 10 mLs
4. 5 mLs
5. 3 mLs
6. 2 tablets
7. 0.5 grams
8. 5 mLs
9. 1 mL
10. 30 mLs

If you answered all of the questions correctly, go on to the next section. If you missed one or more, read the content again and repeat the study guide questions.

NOTE: Calculation questions on the Medication Calculation clinical competency test will be multiple choice. You may use a calculator when completing the test. Metric equivalencies and dimensional analysis formula will be provided.

If scratch paper will be provided, you are required to write your name. Submit the used scratch/calculation paper to a proctor at the end of the test.
Licensed Workforce Members in Patient Care Areas

INJURY PREVENTION

Clinical Competency Description

**Competency Statement:** Workforce member demonstrates understanding of strategies to prevent injuries.

<table>
<thead>
<tr>
<th>Critical Behaviors</th>
<th>Learning Activities</th>
<th>Method of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifies which four (4) pictures of eight (8) demonstrate correct techniques to prevent workplace injury.</td>
<td>Reviews DHS and facility-specific policies/procedures related to injury prevention.</td>
<td>Completes Injury Prevention Performance Checklist with 100% accuracy.</td>
</tr>
</tbody>
</table>

**Performance Checklist**

<table>
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<tr>
<th>Performance Criteria</th>
<th>Met</th>
<th>Not Met</th>
<th>Comments</th>
</tr>
</thead>
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<tr>
<td>Identifies which four (4) pictures of eight (8) demonstrate correct techniques to prevent workplace injury.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognizes three (3) strategies for preventing workplace injury.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Licensed Workforce Members in Patient Care Areas

FALL PREVENTION

Clinical Competency Description

**Competency Statement:** Workforce member demonstrates understanding of fall risk factors and strategies to prevent falls.

<table>
<thead>
<tr>
<th>Critical Behaviors</th>
<th>Learning Activities</th>
<th>Method of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicates which five (5) pictures of ten (10) would best prevent a fall.</td>
<td>Reviews the following: DHS and facility specific policies/procedures/protocols related to fall prevention. Reviews Fall Prevention in the 2017 Nursing Inpatient Annual Core Competency Study Guide: Licensed.</td>
<td>Completes Fall Prevention Performance Checklist with 100% accuracy.</td>
</tr>
<tr>
<td>Identifies correctly three (3) risk factors for falls.</td>
<td></td>
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**Performance Checklist**

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REFERENCES

2017 NATIONAL PATIENT SAFETY GOALS


EVENT AND NEAR MISS NOTIFICATION:
USING THE SAFETY INTELLIGENCE REPORTING SYSTEM


HAND OFF COMMUNICATION


SAFE PATIENT HANDLING AND INJURY PREVENTION


PREVENTION OF PRESSURE ULCERS


FALL PREVENTION


LAC+USC Healthcare Network, Department of Nursing Services (2014). *Nursing Policy# 802: Fall prevention*. Los Angeles County Department of Health Services (2014). *DHS System-Wide Fall Prevention Program. Policy #311.10*


National Database of Nursing Quality Indicators (NDNQI) (July 2016). *Guidelines for data collection and submission on quarterly indicators.*

MEDICATION ADMINISTRATION


Centers for Medicare and Medicaid Services, Department of Health and Human Services. (2014). Condition of participation: Nursing services. 42 C.F.R. § 482.23(c).


Los Angeles County Department of Health Services Quality Improvement & Patient Safety Program (2014). Safe use of “PCA”.


