County of Los Angeles
Department of Health Services

INPATIENT

Annual Core Competency Study Guide (Nursing)

2012 Licensed
(Patient Care & Non-Patient Care Areas)
2012 DHS INPATIENT ANNUAL CORE COMPETENCY STUDY GUIDE
(NURSING): LICENSED

PREFACE

This study guide is designed to update the nursing department licensed workforce member on important issues that assist them in providing safe and competent patient care. The study guide is divided into three sections.

Section I – Patient Safety includes competencies relating to the following: 2012 National Patient Safety Goals, Hand Off Communication, Customer Service, Pressure versus Non-Pressure Skin Conditions, Early Sepsis Diagnosis and Treatment, and Patient Privacy/HIPAA.

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

Section III – Performance Stations include the following competencies: Medication Safety, Role in an Emergency: the Deteriorating Septic Patient.

The following table describes which workforce members must complete the above sections of the study guide and testing components.
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<td>• Special Programs Unit</td>
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<tr>
<td>• Licensed Staff</td>
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**NOTE:**

1. RNs and LVNs identified in the above table working in Labor and Delivery complete the inpatient and 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.
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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.
SECTION I
PATIENT SAFETY

2012 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.
2. Identify the 2012 National Patient Safety Goals for hospitals.
3. Describe nursing roles and responsibilities related to implementation of the 2012 National Patient Safety Goals.

I. Introduction

The Joint Commission develops, re-evaluates, and revises the National Patient Safety Goals (NPSGs) on an annual basis, with the goal being to identify significant patient care issues and specify system-wide patient safety improvements (The Joint Commission, 2011). While some goals are revised or deleted, others become part of The Joint Commission Standards. Since January 1, 2003, The Joint Commission has required healthcare organizations to comply with the NPSGs (The Joint Commission, 2010). The NPSGs are developed by The Joint Commission using evidence- or expert-based data in order to improve patient safety and reduce the risk of adverse events.

For 2012, The Joint Commission revised the NPSGs and associated requirements (The Joint Commission, 2011) using the following three criteria to determine the necessary revisions:

A. Impact - Frequency and severity of adverse outcomes
B. Cost - Patient and societal costs resulting from this adverse outcome
C. Effectiveness - Likelihood a particular intervention will be effective

II. The 2012 National Patient Safety Goals for hospitals include the following five goals (NPSG #1, 2, 3, 7, 15) and applicable elements as well as the Universal Protocol:

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

B. NPSG #2: Improve the effectiveness of communication among caregivers
   1. 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

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)

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, formerly NPSG.08)

D. 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 in acute care hospitals (NPSG.07.03.01)

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

4. Implement evidence-based practices for preventing surgical site infections (NPSG.07.05.01)

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

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

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

F. The Universal Protocol for Preventing Wrong Site, Wrong Procedure, and Wrong Person Surgery

1. Conduct a pre-procedure verification process (UP.01.01.01)

2. Mark the procedure site (UP.01.02.01)

3. Perform a time-out before the procedure (UP.01.03.01)

III. Safety Goal Guidelines

A. 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 facility-specific policy.

B. NPSG #1: Improve the accuracy of patient identification

1. Mistakes related to patient misidentification occur throughout all phases of
diagnosis and treatment. 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, procedure, medication, clinical intervention, or patient encounter.
   
   b. Patient identifiers include **Patient's Name** and one of the following:
      - Medical record unit number (MRUN)
      - 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 MRUN.
   
   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 MRUN) 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.

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 MRUN on
the patient identification band against identification printed on relevant documents prior to administering blood or blood components.

C. **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.

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

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.

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. A new requirement by The Joint Commission mandates that hospitals educate patients about the importance of keeping medication information current and updated.

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 Centers for Disease Control and Prevention (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 World Health Organization hand hygiene guidelines that consists of developing policies, fostering a "culture of hand hygiene," and monitoring compliance.

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 should be washed with soap and water in the following situations:

- When hands are visibly soiled or contaminated with blood or body fluids
- Before and after using the restroom
- After caring for patients with *Clostridium difficile* or *Bacillus anthracis* (anthrax)
- After removing gloves if gloves are visibly soiled with blood or body fluids
- Before and after performing procedures on patients
- After every 5-10 applications of alcohol-based hand sanitizer (recommended)

h. An alcohol-based hand sanitizer may be used instead of hand washing in the following situations:

- Before and after having direct contact with patient’s intact skin
- After contact with mucous membranes or non-intact skin if hands are not visibly soiled
- After contact with inanimate objects (equipment, bed, etc.) in patient’s immediate area

i. Hand hygiene techniques

   i. Hand washing

   - Wet hands, wrists to mid-arm
   - Apply soap
   - Create lather with friction
   - Rub hands vigorously for at least 15 seconds, covering all surfaces of wrists, hands, and fingers
   - Rinse with water and dry thoroughly using a disposable towel
ii. Alcohol-based hand sanitizers

- Apply to palm of one hand
- Rub both hands together covering all surfaces of hands and fingers until dry

j. Long nails, extenders, and artificial fingernails are not permitted. 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 is discouraged because they can harbor bacteria and also tear gloves.

2. Implement evidence-based practices to prevent healthcare-associated infections due to multidrug-resistant organisms 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. Multidrug-resistant organisms (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 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, must be discussed with each patient or family on the day of admission or as soon as possible.

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.

   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:

- Perform hand hygiene 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 clean catheter port with an approved antiseptic agent prior to accessing port (e.g., for blood withdrawal or intravenous medication administration)
- Use aseptic technique and clean insertion site with chlorhexidine during central line dressing change

4. Implement evidence-based practices for preventing surgical site infections (NPSG.07.05.01).

a. Hospitals must implement best practices for preventing 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 one year of an operation if a foreign body (e.g., an artificial heart valve) is implanted as part of the surgery.

b. Patients and families should be educated on prevention of surgical site infections.

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

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

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

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

a. As of January 1, 2012, hospitals must begin implementing evidence-based practices to prevent CAUTIs, with full implement being required by January 1, 2013.

b. Hospitals must use evidence-based practice to determine the frequency and duration of indwelling urinary catheter insertion. 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. This NPSG does not apply to pediatric patients. Evidence-based research studies were carried out with adult patients only and therefore, generalizability to the pediatric population is unknown.

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 among hospitalized patients is a commonly reported sentinel event. 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

i. 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.

ii. 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.

iii. 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.

4. With the patient’s consent, healthcare providers may use information provided by family members when determining patient’s risk of suicide.

5. 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

1. 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.

2. The level of observation (e.g. 1:1, close observation) should be determined and the effectiveness of their implementation routinely evaluated.

3. Nursing staff responsibilities

   a). Assess for and immediately notify primary physician of any newly identified suicide risks, thoughts, ideations, and previous attempts expressed by the patient

   b). 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?”

   c). Ensure patient is in view of nursing staff at all times

   d). 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)

   e). Follow facility-specific policy if patient elopes from area

   f). Assist patient to identify and develop alternative coping strategies
g). 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

1. Provide clear and concise discharge instructions, particularly related to medications and follow-up appointments.

2. Ensure patient understands follow-up clinic visits, location, and importance.

3. 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

G. The Universal Protocol for Preventing Wrong Site, Wrong Procedure, and Wrong Person Surgery

1. 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 preprocedure verification and the site marking. Site marking is not necessary when the healthcare provider performing the procedure remains in the patient’s presence from the time the decision is made to perform the procedure until the procedure is completed.

   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.

2. Conducting a pre-procedure verification process

   a. 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, and site along with the patient’s perceptions should be included in the verification process.
b. 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 determination 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. This process must be documented on a pre-procedure checklist. 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.

c. Missing information or discrepancies must be addressed before starting the procedure.

3. Marking the procedure site

a. According to The Joint Commission (2010), site marking is a method of communicating about the patient for the team 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. Although there is no consensus on who is responsible for marking the 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, 2011)

b. 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 such that the mark will be visible after the patient has been prepped and draped.

4. Performing a time-out

a. 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.

b. 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.

c. 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.

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

IV. Conclusion

The National Patient Safety Goals were implemented in 2003 to reduce the risk of adverse events and improve patient safety. For 2012, National Patient Safety Goals #1, 2, 3, 7, 15, relevant elements, and the Universal Protocol have been revised using evidence- and expert-based data. (The Joint Commission, 2011) There are many strategies that hospitals may use to achieve these 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
2012 NATIONAL PATIENT SAFETY GOALS
Study Questions

Select the best answer to each question.

1. All of the following are 2012 National Patient Safety Goals EXCEPT:
   a. Improve the accuracy of patient identification: Use at least one patient identifier when providing care, treatment, or services
   b. Improve the safety of using medications: Maintain and communicate accurate patient medication information
   c. Reduce the risk of healthcare-associated infections: Implement evidence-based practices to prevent indwelling catheter-associated urinary tract infections (CAUTI)
   d. Improve effectiveness of communication among caregivers: Report critical results of tests and diagnostic procedures on a timely basis

2. Strategies to reduce the incidence of healthcare-associated infections resulting from multidrug-resistant organisms include:
   a. Placing all patients in strict isolation
   b. Providing seat covers in all patient bathrooms
   c. Initiating antibiotics for every patient upon admission
   d. Hand hygiene, cleaning and disinfecting patient care equipment and the environment, and contact precautions

3. The purpose of medication reconciliation is to:
   a. Avoid errors of transcription
   b. Eliminate duplication of therapy
   c. Prevent medication interactions
   d. All of the above

4. Which of the following is a component of the Universal Protocol?
   a. Hand off communication
   b. Marking the procedure site
   c. Ensuring post-operative orders are completed prior to surgery
   d. Administering broad spectrum antibiotics 24 hours prior to surgery

5. Nursing staff caring for patients at risk for suicide should:
   a. Maintain patient privacy by allowing patients to go to the bathroom unattended
   b. Not take verbal threats of self-injury seriously since most threats are merely a cry for help
   c. Report to the primary physician any newly identified suicide risks, thoughts, or ideations by patients
   d. Give patients directions to designated smoking areas before letting them leave the ward unescorted for cigarette breaks
6. Which of the following is a TRUE statement regarding catheter-associated urinary tract infections (CAUTIs) (NPSG.07.06.01)
   a. This NPSG applies to all hospitalized patients regardless of their age
   b. Indwelling urinary catheter should be changed every shift to prevent infection
   c. Evidence-based guidelines should be used in the management of urinary catheters
   d. As of January 1, 2014, hospitals must begin implementing evidence-based practices to prevent CAUTIs, with full implementation being required by January 1, 2015

PLEASE CHECK YOUR ANSWERS TO THE STUDY QUESTIONS

2012 NATIONAL PATIENT SAFETY GOALS
Answers to Study Questions

1. a
2. d
3. d
4. b
5. c
6. c

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.
REFERENCES


BIBLIOGRAPHY


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, 2006).

Hand off communication is a means of delivering important patient care information that helps promote continuity of care and patient safety (The Joint Commission, 2006). 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, 2006).

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 (2006) 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.

E. The components of a hand off communication report vary between healthcare institutions, but in general include the following:

1. Patient’s name
2. Allergies
3. Diagnosis
4. Current vital signs and pain score and any recent change in condition
5. Latest treatments and procedures
6. Pending treatments, procedures, or laboratory tests
7. Equipment or supplies needed for patient care
8. Additional information, such as holds or isolation precautions
9. Patient safety issues, such as falls, pressure ulcers, or suicide risk

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

PLEASE CHECK YOUR ANSWERS TO THE STUDY QUESTIONS

HAND OFF COMMUNICATION
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.
REFERENCES


BIBLIOGRAPHY

CUSTOMER SERVICE

Objectives:

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

1. State reasons why customer service is important.
2. List ways to provide excellent customer service.
3. Identify the DHS’ customers, both internal and external.
4. Discuss customers’ role in determining the value of service.
5. Explain the definition and importance of patient-centered care.
6. Identify effective communication strategies to promote patient-centered care.

I. Importance of Customer Service

Healthcare is the fastest changing industry in the world today. Hospitals continue to undergo changes in payments, and there is increased competition among healthcare providers for patients.

A. Hospitals are shifting from provider-centered, where people made choices in the best interest of the hospital, to patient centered, where choices are in the best interest of patients.

B. Employers buying healthcare for their workers make decisions based on a hospital’s ratings and reputation.

C. Managed care is leading healthcare delivery in the U.S., making hospitals compete with each other for managed care contracts. Customer satisfaction is one important area considered when deciding which hospitals to include in their contract.

D. Health insurance plans will link finances and service. The Federal Medicare program requires hospitals to report patient satisfaction scores so they can publish them on the website hospitalcompare.hhs.gov. Medicare will use patient satisfaction scores to determine nearly one-third of the performance-based pay that hospitals will receive.

E. The customer defines the value of service given! Much of what customers and families perceive is based on your staffs’ attitude and performance while giving service. The customers’ perception of the service provided determines patient satisfaction, which is reflected in patient satisfaction scores.

F. Everyone in the institution should be actively and enthusiastically involved in giving positive customer service. Licensed staff members are responsible for leading the way in achieving the highest possible rate of patient satisfaction.

G. Without customers, we would not have jobs.

II. Definitions

A. Customer service: The degree of help and courtesy granted to those that staff interact with and serve.

B. Customers: Patients, their families, and anyone staff interacts with in your facility.
C. **External customers:** People who come to the facility from the outside for a service. Examples: patients, families, vendors, students, speakers, etc.

D. **Internal customers:** All those who work at the facility. Examples: nurses, therapists, doctors, custodians, administrative staff, etc.

III. Telephone Manners

A. Telephone manners are a polite response to telephone callers. Manners are important in forming first impressions and set the tone for future interactions.

Remember:

- Speak slowly, clearly, and directly into the mouthpiece held two-finger widths away from your mouth.
- Use your normal tone of voice when answering a call. Lower your voice volume if you tend to speak loudly.
- Do not eat, drink, or chew gum while talking on the phone.
- Try to answer on the second ring.
- Include a friendly greeting, your name, location, and an offer to help when answering the telephone. (Example: “Good Morning, Intensive Care Unit, this is Mary Brown. How may I help you?”)
- Never use slang or swear words.
- Listen to what the caller has to say.
- Be patient and helpful.
- Ask permission before putting the caller on hold. (Example: “May I put you on hold while I check if Dr. Millett is available?”)
- Thank the caller for holding when taking the call off hold. (Example: “Thank you for holding Mr. Choi. The nurse will speak to you in just a minute.”)
- When transferring a call, tell the caller to whom they are being transferred. (Example: “Let me give you Dr. Millett’s office phone number… Please hold; I will transfer you to Dr. Millett’s office.”)
- When transferring a call, announce the caller to the person receiving the call. (Example: “Good Morning, this is Mary Brown from the Intensive Care Unit. I am transferring a call from Mr. Choi.”)
- Address all questions and concerns before hanging up the telephone. (Example: “Mr. Choi, Is there anything else I can do for you today?”)
- Let the caller hang up first. This lets the caller know you are not in a hurry to get off the phone with them.
IV. Patient Centered Care

Patient-centered care is a component of quality care in which staff collaborate with the healthcare team and partner with their patients and their families. Patient-centered care respects and responds to patients’ wants, needs, and preferences so they can make choices in their care that best fit their individual circumstances. Care that is truly patient-centered considers patients’ cultural traditions, personal preferences and values, the family situations, and lifestyle.

B. What you say is as important as how you say it!

Important key phrases:

<table>
<thead>
<tr>
<th>Don’t Say:</th>
<th>Instead Say:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No, or I can’t</td>
<td>What I can do is…</td>
</tr>
<tr>
<td>I don’t know</td>
<td>I will find out for you</td>
</tr>
<tr>
<td>That is not my job</td>
<td>I will get someone to help you</td>
</tr>
<tr>
<td>You’re right, that stinks</td>
<td>I understand your concerns</td>
</tr>
<tr>
<td>We are short staffed</td>
<td>We may be busy, but we are never too busy to help you</td>
</tr>
<tr>
<td>I’m busy right now</td>
<td>I’ll be with you in just a moment</td>
</tr>
<tr>
<td>It’s over there</td>
<td>I’ll take you where you need to go</td>
</tr>
</tbody>
</table>

C. Helpful Patient Communication and Comfort Strategies

- Check that each patient is covered and comfortable
- Do an environmental assessment: Can the patient reach the telephone, water, food tray, TV controls, and trash?
- Tell the patient that you regularly make rounds to check comfort levels
- Tell the patient when you will be returning
- Tell the patient when you are leaving and name of nurse who will be following you
- When possible, bring relieving nurse into room and introduce the nurse to the patient

V. Environment: Appearances Matter

When our workplace and staff appear neat and clean, we show respect for our customers and give them confidence in our ability to care for them.

A. Workplace:

- Store equipment in its proper place
- Clean up spills and dispose of trash in a timely manner
- Keep patient care areas, employee work areas, hallways, and conference rooms clean, neat and clutter free

B. Workforce members:

- Wear identification badges in a visible location above your waist
- Ensure visitors wear visitor passes. If not, refer them to security for visitor pass
- Wear appropriate, clean, neat clothing following the hospital’s dress code
- Avoid wearing fragrance/scents; many people have fragrance allergies
- Use good personal hygiene
- Hair is to be clean, neat, safely secured, and not to compromise patient care
- Jewelry must be consistent with the work assignment, not injurious to the patient, nor pose a potential safety problem to the employee
Fingernails must be clean and short, not to extend greater than ¼ inch beyond the fingertips. No artificial nails
Wear clean shoes with enclosed heels and toe

VI. Practice principles of CUSTOMER SERVICE

A. Compassion

1. Courteous
   • Welcome customers
   • Acknowledge customer’s presence
   • Make eye contact and smile
   • Use a pleasant tone of voice
   • Be polite and helpful
   • Do things right the first time
   • Provide customers with choices, when possible

2. Concerned
   • Take time to listen
   • Give the customer your full attention
   • Ask if you are unsure whether someone needs help
   • Be willing to explain delays
   • Know where to direct the customer for service
   • If you cannot help, find someone who can
   • Respond quickly to customers’ needs

B. Communication

• Check customers’ understanding
• Clarify using questions
• Give clear instructions
• Speak clearly
• Do not use jargon/slang
• Use the customers’ language, if possible

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
CUSTOMER SERVICE

Study Questions

Select the best answer to each question.

1. Which of the following is helpful customer communication?
   
   a. Talk as loud as you can
   b. Look away when talking to a customer
   c. Hang up the phone before the caller does
   d. Thank customers and ask, “Is there anything else I can do for you?”

2. How can we provide excellent customer service?
   
   a. Store equipment in hallways
   b. Do tasks right by the fifth time
   c. Wear name badge below your waist
   d. Give the customer your full attention

3. A customer is anyone you meet at your facility.
   
   a. True
   b. False

4. Patient-centered care considers patients’ cultural traditions, personal preferences and values, family situations, and lifestyle.
   
   a. True
   b. False

PLEASE CHECK YOUR ANSWERS TO THE STUDY QUESTIONS

CUSTOMER SERVICE

Answers to Study Questions

1. d
2. d
3. a
4. 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.
BIBLIOGRAPHY


PRESSURE VERSUS NON-PRESSURE SKIN CONDITIONS

Objectives:

Upon completion of this section the participant will be able to:

1. Review the process of skin assessment.
2. Identify the stages of pressure ulcers.
3. Differentiate between pressure and non-pressure skin conditions.
4. Differentiate between arterial, venous, and diabetic ulcers.

I. Introduction

Pressure ulcers are frequent, costly, and potentially life-threatening problems in hospitalized patients. They interfere with community reintegration, quality of life, and self esteem. It is estimated that in the United States 2.5 million people in acute care facilities develop pressure ulcers yearly. Due to the high cost of treatment and the negative impact on patients, it is important that nurses properly identify pressure ulcers when present. Documentation must be thorough, timely and accurate upon the discovery of any skin problem. This documentation should include, but not be limited to progression, treatment, and outcome.

Hospitals are not reimbursed for a hospital acquired stage 3, stage 4, or unstageable pressure ulcer. Additionally, hospitals are not reimbursed for the progression of a stage 1 to stage 3 or 4 or unstageable and for a stage 2 pressure ulcer to stage 4 or unstageable. It is key that pressure ulcers present on admission are staged accurately. Hospitals are mandated to report these occurrences to the California Department of Public Health within five calendar days or maybe subject to a fine of one hundred dollars a day for failure to report on time.

II. Skin assessment

Assessment of the skin must be done on admission and during each shift according to facility policy. A two person assessment is recommended on admission so that no skin problem goes undetected. The entire surface of the skin must be visualized including areas under medical devices, clothing, and dressings. Photographs must be obtained upon discovery or deterioration of skin problems. An additional photo is necessary for documentation upon discharge or transfer to an outside facility.

III. Differentiating Pressure versus Non-pressure skin conditions

It is important to accurately differentiate between skin problems caused by pressure and /or shearing force from those that are not pressure related. If there is any doubt regarding the nature of a given skin problem, the appropriate resources must be utilized. Expert consultation will often be helpful.

A. Pressure Ulcers

A pressure ulcer is localized injury to the skin and/or underlying tissue, usually over a bony prominence, as a result of pressure or pressure in combination with shearing force. A pressure ulcer may also result from pressure to the skin under a medical device. The National Pressure Ulcer Advisory Panel classification system identifies six stages:

- **Stage 1** - Intact skin with non-blanchable redness of a localized area usually over a bony prominence.
Stage 2 – Partial thickness, loss of dermis presented as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open, ruptured serum-filled blister.

Stage 3 – Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon, or muscle is not exposed. Slough might be present but does not obscure the depth of the tissue loss. May include undermining and tunneling.

Stage 4 – Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar might be present on some parts of the wound bed and often includes undermining and tunneling.

(Suspected) Deep Tissue Injury – Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shearing force.

Unstageable – Full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, green, brown) and/or eschar (tan, brown or black) in the wound bed. A wound is designated unstageable if the base of the wound cannot be visualized due to necrotic tissue covering it.

Pressure ulcers do not heal in a reverse sequence. For example, a stage 3 ulcer is considered a healing stage 3 as it improves.

The National Pressure Ulcer Advisory Panel’s classification system is only intended to be used to stage pressure ulcers. This system should not be used to stage wounds caused by non-pressure related skin conditions, such as arterial, venous, or diabetic ulcers, tape burns, perineal dermatitis, maceration, or excoriation.

B. Non-pressure skin problems

Some skin problems cannot be categorized as pressure ulcers such as, diabetic ulcers, venous stasis ulcers, and arterial insufficiency ulcers, to name a few. Any skin problem that is not located over a bony prominence or underneath a medical device, should be assessed further, prior to staging it as a pressure ulcer. The advice of an expert should be consulted as needed.

The following table summarizes the basic differences between pressure and non-pressure related ulcers.

<table>
<thead>
<tr>
<th></th>
<th>Common Locations</th>
<th>Cause</th>
<th>Looks like</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Ulcer</td>
<td>Bony prominence or under a medical device</td>
<td>Pressure and/or shearing force</td>
<td>Refer to ulcer stages</td>
</tr>
<tr>
<td>Venous Ulcer</td>
<td>Distal lower leg</td>
<td>Venous insufficiency</td>
<td>Irregular border, red base</td>
</tr>
<tr>
<td>Arterial Ulcer</td>
<td>Foot, ankle, toes</td>
<td>Arterial insufficiency</td>
<td>Devitalized tissue, regular border</td>
</tr>
<tr>
<td>Diabetic Ulcer</td>
<td>Plantar area</td>
<td>Repetitive trauma, neuropathy</td>
<td>Well-marked border, callus around wound</td>
</tr>
</tbody>
</table>

Adapted from Levine and Ayello, 2010

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
PRESSURE VERSUS NON-PRESSURE SKIN CONDITIONS

Study Questions

Select the best answer to each question.

1. Skin assessment must be performed on admission and at a minimum of which of the following frequencies?
   a. Every 30 minutes
   b. Every shift
   c. Daily
   d. Weekly

2. If on admission the nurse discovers an area of intact skin that does not blanch when palpated, the following pressure ulcer stage should be documented?
   a. Stage 1
   b. Stage 3
   c. Unstageable
   d. (Suspected) deep tissue injury

3. For a patient with a history of diabetes and peripheral neuropathy, an open wound on the plantar area of the right foot probably indicates what type of wound?
   a. Pressure ulcer
   b. Skin maceration
   c. Diabetic ulcer
   d. Plantar laceration

4. The nurse notices a blister on the top of the patient’s outer forearm. The patient denies any sensation to the area and does not recall what happened. The nurse accurately documents this finding as which of the following?
   a. (Suspected) deep tissue injury
   b. Intact blister on top of right hand
   c. Stage 1 pressure ulcer on outer forearm
   d. Stage 3 pressure ulcer on outer forearm

5. A left lower leg wound with an irregular border and a red base is more likely to be which of the following?
   a. Venous ulcer
   b. Peptic ulcer
   c. Pressure ulcer
   d. Diabetic ulcer

PLEASE CHECK YOUR ANSWERS TO THE STUDY QUESTIONS
PRESSURE VERSUS NON-PRESSURE RELATED SKIN CONDITIONS
Answers to Study Questions

1. b
2. a
3. c
4. b
5. 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.
BIBLIOGRAPHY


EARLY SEPSIS DIAGNOSIS AND TREATMENT

Objectives:

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

1. Define sepsis.
2. Identify Systemic Inflammatory Response Syndrome (SIRS).
3. Describe the purpose/abnormal values for serum lactate levels.
4. Identify four interventions to reduce the morbidity/mortality of septic patients.

I. Introduction

Sepsis is a syndrome characterized by the body’s systemic response to a bacterial infection. Without treatment sepsis can rapidly progress to organ failure and eventually lead to death. The following facts are associated with sepsis:

- Sepsis is one of the world’s oldest and most virulent killers
- Sepsis can trigger the onset of abnormal bleeding and clotting of blood
- 30 percent of patients die within first month of diagnosis
- 50 percent of patients die within 6 months of diagnosis
- Worldwide 1,400 people die from sepsis daily
- More than 500 people die each day of severe sepsis in America
- Cost to treat sepsis in the United States: $17 billion a year

The Surviving Sepsis Campaign is a worldwide initiative, which is led by the Society of Critical Care Medicine to standardize the management of severe sepsis and septic shock. The standardization is grouped into bundles, which contain specific orders of lab test, medication, and procedures to provide the most effective management of sepsis. The goal is to identify and treat septic patients quickly thereby reducing the high mortality rate associated with the disease. The Los Angeles County Department of Health Services has implemented the campaign recommendations into the county healthcare delivery system to reduce the mortality of sepsis and strive for the best possible patient outcomes through the use of evidence-based practices. Each hospital has created standard orders that incorporate the research based recommendations for the treatment of sepsis.

The goal is to identify the septic patient as early as possible.

Early treatment enhances a patient’s chances of survival.

II. Diagnosis

Early identification of the septic patient is key. A patient is to be aggressively treated for sepsis if the healthcare provider suspects the patient has an infection and the patient exhibits at least two (or more) of the following Systemic Inflammatory Response Syndrome (SIRS) criteria:

- Temperature less than 36°C or greater than 38°C (less than 96.8°F or greater than 100.4°F)
- Heart rate greater than 90 beats per minute
- Respiratory rate greater than 20 breaths per minute
- PaCO₂ less than 32 mm Hg
- White Blood Cell count (WBC) greater or equal to 12,000 … or equal or less than 4,000 … or more than 10% bands
A minimum of 2 out of 4 criteria measures for SIRS + Suspected Infection = Sepsis

Any patient with severe sepsis/septic shock is admitted to the ICU

III. Definitions

The term sepsis is frequently used to identify any patient with serious infection. This condition is a progressive disorder that advances along the following continuum:

- **Sepsis**: The definition of sepsis is the presence of at least 2 out of 4 criteria measures for SIRS in addition to a presumed or documented infection. Sepsis is the body’s systemic response to infection.

- **Severe Sepsis**: Severe sepsis is sepsis with organ dysfunction. Common organ dysfunction associated with severe sepsis includes renal failure, liver failure, respiratory failure, cardiac dysfunction, etc.

- **Septic Shock**: Patients meet the criteria for septic shock if they have persistent hypotension and perfusion abnormalities despite adequate fluid resuscitation and/or an elevated lactate level.

IV. Bundle Elements

Four bundle elements that must be monitored and implemented for patients with suspected or actual sepsis include:

- Draw a serum lactate
- Obtain blood cultures prior to antibiotic administration
- Administer a broad-spectrum antibiotic within 3 hours of Emergency Department (ED) declaration of sepsis and 1 hour of non-ED identification of sepsis
- Treat hypotension and/or elevated lactate (greater than 4 mmol/L) with intravenous fluids

A. Measure serum lactate

Lactate levels are essential in identifying hypoperfusion at the cellular level in patients who are not yet hypotensive, but who are at risk for septic shock. Elevated lactate levels are typically observed in patients with septic shock or severe sepsis. The rise in lactate is caused by anaerobic metabolism that occurs as a result of hypoperfusion. A lactate level greater than 4 mmol/L is a critical value, which must be reported to the clinician.

**Remember: obtain a lactate level on ALL patients who have initial blood cultures drawn!**

B. Obtain blood cultures prior to antibiotic administration

Over the past two decades the incidence of bacteremia and sepsis in the critically ill patient has increased. Positive blood cultures are found in 30% - 50% of patients diagnosed with sepsis. Collecting blood cultures is the best opportunity to identify the organism causing sepsis in a patient. Failure to draw blood cultures prior to antibiotic administration can affect the growth of any blood-borne bacteria and prevent a positive blood culture.

C. Research has demonstrated that early administration of antibiotics reduces mortality in patients with sepsis. These studies have shown that for every hour antibiotics are delayed in the hypoperfused patient, mortality increases by 7%. From the time sepsis is declared,
broad spectrum antibiotics must be given within 3 hours for the ED patient and 1 hour for patients already in the hospital to treat the underlying infection.

D. Hypotension and/or elevated lactate levels must be treated with aggressive intravenous fluid resuscitation:

- Initial (minimal) fluid bolus 20 ml/kg of crystalloid or an equivalent
- 1 liter wide open, Normal Saline, to increase blood pressure
- Vasopressors may be started if hypotension is not responding to initial fluid resuscitation
- The goal is to maintain a mean arterial pressure (MAP) greater than 65 mm Hg

E. Septic shock and severe sepsis may cause ineffective circulation as a result of vasodilatation.

Vasodilatation $\rightarrow$ hypotension $\rightarrow$ decreased tissue/organ perfusion $\rightarrow$ increased lactate levels $\rightarrow$ increased morbidity/mortality

All patients with severe sepsis/septic shock should be admitted to the ICU

Central venous pressure (CVP) lines are inserted in monitored areas and used as a tool to gauge the fluid status of the patient.

V. Conclusion

Rapid diagnosis and management of sepsis is essential to treat the patient successfully. Patients diagnosed with severe sepsis are critically ill. Rapid interventions must be implemented to avoid rapid deterioration. The key to successful treatment of the patient with sepsis is rapid diagnosis and early interventions.

Sepsis Bundle

- Serum lactate level
- Blood cultures prior to antibiotics
- Antibiotics within 3 hours of ED and 1 hour of non-ED admission
- Initial fluid bolus 20 mL/kg $\rightarrow$ vasopressor if no response

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
EARLY SEPSIS DIAGNOSIS AND TREATMENT
Study Questions

Select the best answer to each question.

1. In addition to blood cultures, what serum lab draw should be drawn to evaluate for hypoperfusion?
   a. Sodium level
   b. Lactate level
   c. Antibiotics
   d. Potassium level

2. An elevated serum lactate level is reflective of:
   a. Excessive oxygen delivery to the tissues
   b. Normal creatinine level
   c. Hypoperfusion at the cellular level
   d. An elevated serum lactate level is a normal finding

3. Hypotension should be:
   a. Left untreated unless present for more than 24 hours
   b. Considered a normal finding
   c. Treated initially with intravenous fluids
   d. Ignored until the appropriate admission paperwork is completed

CHECK YOUR ANSWERS TO THE STUDY QUESTIONS

EARLY SEPSIS DIAGNOSIS AND TREATMENT
Answers to Study Questions

1. b
2. c
3. c

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.
BIBLIOGRAPHY


HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA)

Objectives:

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

1. Describe the purpose of the HIPAA Privacy Act.
2. Identify individual and organizational consequences for failure to comply with the act.
4. Identify practices that should be avoided in order to maintain patient privacy.

I. The Compliance Requirements for Providers of Health Care, Assembly Bill 211 (AB 211), is a state law stating an individual can be held accountable and individual fines can be imposed ranging from $2,500 for negligent unlawful disclosure of protected health information (PHI) to $250,000 for unlawful disclosures for the purpose of financial gain. Violation of medical privacy information can also result in legal action being taken against an individual. Senate Bill 541 (SB 541), known as the Health Data Privacy Law, holds licensed health facilities accountable for safeguarding privacy. Failure to do so can result in fines ranging from $25,000 to $250,000 per reported breach.

In addition to California’s State laws, AB211 and SB 541, the Federal Stimulus Act has strengthened the Health Insurance Portability and Accountability Act (HIPAA). This has resulted in an increased enforcement of the act plus significant increases in civil and criminal penalties against individuals and/or health facilities. The financial penalties for failure to comply can result in fines ranging from $50,000 to $1.5 million.

II. How can you prevent breaches and penalties?

Everyone is responsible for safeguarding confidential and patient information. All healthcare workers must know their responsibility, which includes familiarity with and adherence to the Department of Health Services and specific facilities’ privacy policies. The following are examples of safeguards:

- Access patient information only when needed to do your job
- Do not share your passwords or allow another individual to access a computer system using your password
- Share patient information “on a need to know basis” only with staff who need the information to do their job
- Do not post patient or confidential information on social networking websites
- Follow all policies regarding faxing and destruction of patient information
- Do not save or store patient information on computer hard drives
- Encrypt and password protect all mobile computing devices
- Speak quietly when discussing care with a patient
- Do not discuss patient care in elevators or public places
- Follow incident reporting procedures. By law, incidents must be reported to the proper state agencies within 5 business days

III. Department of Health Services’ workforce members are required to immediately report privacy or security breaches involving PHI or confidential information to their supervisor or to the facility Privacy Coordinator. A privacy breach is defined as any unlawful or unauthorized access to and/or use or disclosure of a patient’s protected health information in any format (e.g., spoken, printed, or electronic). Unauthorized access also includes the simple act of logging into and/or viewing such information, even if the information is not disclosed. Protecting patient privacy is
everyone’s responsibility and failure to do so could result in disciplinary action. Such action might include Federal and State criminal individual penalty fines that can range up to $1.5 million, jail time, plus it can affect continued employment and affiliation with the County.

PLEASE COMPLETE THE STUDY QUESTIONS ON THE NEXT PAGE
HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA)
Study Questions

Select the best answer to each question.

1. Strategies for maintaining patient privacy include which of the following:
   a. Sharing passwords with coworkers
   b. Logging off the network terminal whenever leaving the computer station
   c. Keeping medical records and other documents containing protected health information (PHI) in public view for easy access
   d. Conducting hand off communication in the elevator to save time

2. Which of the following is a TRUE statement regarding fines imposed for noncompliance with HIPAA laws?
   a. Employees cannot be fined or held responsible for HIPAA laws
   b. HIPAA laws only apply to private healthcare organizations
   c. A maximum penalty may include up to $1.5 million, imprisonment, and release from county service
   d. County healthcare organizations are exempt from HIPAA laws

CHECK YOUR ANSWERS TO THE STUDY QUESTIONS

HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA)
Answers to Study Questions

1. b
2. c

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.
BIBLIOGRAPHY


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. Identify the number and type of patient identifiers required prior to medication administration.
2. Determine if a given medication order is acceptable.
3. Identify appropriate actions to take if orders are incorrect, incomplete, illegible, or contain unapproved abbreviations.
4. Discuss strategies nurses can implement to prevent medication errors.
5. Identify medications that can safely be crushed prior to administration.
6. Identify three high alert medications.
7. Describe nursing safeguards when administering high alert medications.
8. Define black box warning.
9. Describe nursing safeguards when administering medications with a black box warning.
10. Identify two medications that look alike/sound alike.
11. Identify two strategies to minimize errors associated with look alike/sound alike medications.
12. Determine when to use a filter needle.
13. State frequency of checking and reporting refrigerator temperatures used to store vaccines.
14. Determine when to use oral syringes.
I. Introduction

Medication errors account for more than 7,000 deaths each year in the United States. The process of safely providing medications to hospitalized patients is highly complex and involves multiple systems and diverse healthcare professionals. The nurse 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 nurse 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 “Five Rights”

The “five rights” is a standard of care that each nurse must utilize every time medications are administered.

1. Right medication
2. Right dose
3. Right time
4. Right patient
5. Right route

The five rights are important for safe medication practice, but they do not stand alone as measures to prevent medication errors. For example, the five 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 five rights do not address illegible handwritten orders, the use of unapproved abbreviations that may lead to misinterpretation, confusing medication labels, or distractions. Other strategies for preventing medication errors must be implemented in addition to following the five 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 nurse must observe infection control measures at all times when administering medications. For example:

1. Perform hand hygiene before and after administering medications.
2. Maintain sterile technique when drawing up medications for injection.
3. Use gloves when applying suppositories or giving injections.

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):
      i. Patient’s name
      ii. Patient’s medical record number
      iii. Date
      iv. Time
      v. Signature of ordering practitioner (prescriber ID also required in many facilities)
      vi. Name of medication
      vii. Dose
      viii. Frequency
      ix. Route of administration
      x. 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>
</thead>
<tbody>
<tr>
<td>U (for unit)</td>
<td>Mistaken as zero, four or cc.</td>
<td>Write “unit”.</td>
</tr>
<tr>
<td>IU (for international unit)</td>
<td>Mistaken as IV or 10.</td>
<td>Write “international unit”.</td>
</tr>
<tr>
<td>q.d. or Q.D.</td>
<td>Mistaken as q.i.d. especially if the period after the “q” or the tail of the “q” is missing.</td>
<td>Write “daily”</td>
</tr>
<tr>
<td>q.o.d. or Q.O.D.</td>
<td>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”.</td>
<td>Write “every other day”.</td>
</tr>
<tr>
<td>Trailing zero (X.0 mg)</td>
<td>Decimal point is missed and dose read as ten times too much.</td>
<td>Never write a zero by itself after a decimal point (X mg).</td>
</tr>
<tr>
<td>Zero after decimal point</td>
<td>Decimal point is missed and dose read as ten times too much.</td>
<td>Always use a zero before a decimal point (0.X mg)</td>
</tr>
<tr>
<td>Lack of leading zero (.X mg)</td>
<td>Decimal point is missed and dose read as ten times too much.</td>
<td></td>
</tr>
<tr>
<td>MS, MSO₄, MgSO₄</td>
<td>Confused for one another. Can mean morphine sulfate or magnesium sulfate.</td>
<td>Write “morphine sulfate” or “magnesium sulfate”.</td>
</tr>
</tbody>
</table>

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.

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:

1. Before removing the medication from the shelf/unit dose cassette/automated dispensing cabinet.
2. Before pouring or preparing the medication.
3. Before returning the medication to the shelf/unit dose cassette and/or leaving the medication area/room.

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

The nurse 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 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, Amphotec, 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.

1. SCORED 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 can not 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.
2. **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 an 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.

3. **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.

4. **COATED TABLETS**

a. **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.

b. **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, rendering it less effective. 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).
5. 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 preparation 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 1). 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 1. 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.

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, lansaproxole (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 recommendations.

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

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

6. 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.

7. SUMMARY

Table 2 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 2. General principles for cutting or crushing a medication.

<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:
      i. The manufacturer specifies otherwise in package insert or other documentation.
      ii. 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.
      iii. If sterility is questioned or compromised the multidose vial should be discarded.
      iv. 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. Use a filter needle when withdrawing medication from an ampule.

TJC’s Medication Management (MM) Standard MM.0601.01, Element of Performance (EP) #4 requires that the individual administering a medication inspects the medication for particulates, discoloration, or other loss of integrity. Whenever an ampule is opened, there is a risk of very small glass particulates entering the medication. These particulates may not be noticeable with visual inspection. The filter needle was created to assure that particulates, whether visible or invisible, are caught prior to administration. TJC views filter needles as a safeguard for medication administration and should be used to ensure that particulates are not inadvertently administered to the patient.

L. 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.

M. Evaluate the effects of medications.

The nurse 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.

One of the most serious problems associated with medication use is falls. Patients in the hospital are at higher risk for falls due to multiple drug use. The most common drugs related to falls are psychotropic agents (e.g., sedatives, hypnotics, antidepressants, and neuroleptics), antihypertensives, and narcotic pain medications.

Examples of psychotropic agents include divalproex sodium, haloperidol lactate, and levetiracetam. Sedatives include fentanyl citrate, ketamine, and propofol. Hypnotic drugs include phenobarbital, chloral hydrate, and clomethiazole. Examples of antidepressants are bupropion, sertraline hydrochloride, and fluoxetine. Neuroleptic agents include clozapine, risperidone, and promethazine hydrochloride. Antihypertensive drug examples include propanolol, metopropol, and captopril. Examples of narcotic pain medications are morphine, butorphanol, and hydromorphone hydrochloride.

These agents can cause dizziness, drowsiness, and confusion in which can lead to a loss of balance and coordination. Fall prevention measures are an important component to promote patient safety. Nurses must evaluate all medications a patient takes, monitor for adverse side effects, and reassess in a timely manner. A thorough assessment of medication regimens and skillful medication management can reduce the risk of falls in hospitalized patients.

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).

N. Use correct device/supply for medication preparation/administration. – Table 3
Table 3. Medication Administration Devices/Supplies

<table>
<thead>
<tr>
<th>Medication</th>
<th>Device</th>
<th>Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin SQ</td>
<td>1 ml insulin safety syringe</td>
<td><img src="image1.jpg" alt="Insulin SQ Syringe Photo" /></td>
</tr>
<tr>
<td>Liquid oral medication</td>
<td>oral syringe</td>
<td><img src="image2.jpg" alt="Oral Syringe Photo" /></td>
</tr>
<tr>
<td>Parenteral medication in an ampule</td>
<td>20 gauge filter needle</td>
<td><img src="image3.jpg" alt="20 Gauge Filter Needle Photo" /></td>
</tr>
<tr>
<td>Parenteral medication in a vial</td>
<td>Smartip cannula parenteral syringe</td>
<td><img src="image4.jpg" alt="Smartip Cannula Parenteral Syringe Photo" /></td>
</tr>
</tbody>
</table>
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.

**Table 4. DHS Standardized Core High Alert Medications**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heparin SQ</td>
<td>25 gauge needle and 3 ml syringe</td>
</tr>
</tbody>
</table>

- Heparin
- Warfarin
- Thrombolytics
- Sodium chloride solution greater than 0.9%
- Insulins (IV, sub-cutaneous routes only)
- Narcotic/Opiate analgesics (patient controlled analgesia route, fentanyl continuous infusion drips, fentanyl transdermal patches, methadone)
- Neuromuscular blocking agents
- Anti-neoplastic agents
- Magnesium sulfate in Obstetric areas only

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. Insulin is one of the high alert medications that require 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 nurse 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.
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

Nurses must follow facility specific policy/procedure 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, review the list annually, and take action to prevent interchange of these medications. Examples of look alike/sound alike medications are in Table 6.
Table 6. Look Alike/Sound Alike (LASA) Medications

<table>
<thead>
<tr>
<th>CARBOplatin (antineoplastic)</th>
<th>CISplatin (antineoplastic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>clonAZEpam (anticonvulsant)</td>
<td>cloniDINE (alpha-adrenergic agonist)</td>
</tr>
<tr>
<td>DAUNOrubicin (antineoplastic)</td>
<td>DOXOrubicin (antineoplastic)</td>
</tr>
<tr>
<td>DOPAmine (adrenergic agent)</td>
<td>DOBUTamine (adrenergic agonist)</td>
</tr>
<tr>
<td>epheDRINE (bronchodilator)</td>
<td>EPINEPHrine (alpha-beta agonist)</td>
</tr>
<tr>
<td>foLIC acid (vitamin)</td>
<td>foLINIC acid (antidote)</td>
</tr>
<tr>
<td>hydromorPHONE (narcotic analgesic)</td>
<td>MorPHINE (narcotic analgesic)</td>
</tr>
<tr>
<td>hydrOXYzine (anti-histamine)</td>
<td>hydrALAZINE (anti-hypertensive)</td>
</tr>
<tr>
<td>LAMIVudine (anti-retroviral)</td>
<td>LAMOtrigin (antiepileptic)</td>
</tr>
<tr>
<td>LORazepam (benzodiazepine)</td>
<td>ALPRazolam (benzodiazepine)</td>
</tr>
<tr>
<td>OxyCONTIN (brand name for the controlled release preparation of oxycodone)</td>
<td>oxyCODONE (immediate release)</td>
</tr>
<tr>
<td>sulfiSOXAZOLE (antibiotic)</td>
<td>SulfaDIAZINE (antibiotic)</td>
</tr>
<tr>
<td>VinBLAStine (antineoplastic)</td>
<td>VinCRIStine (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:
   a. Medication name
   b. Strength
   c. Quantity
   d. Diluent and volume (if not apparent from container)
   e. Preparation date
   f. Expiration date when not used within 24 hours*
   g. 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.

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 THE NEXT PAGE
MEDICATION SAFETY
Study Questions

Select the best answer to each question.

1. The nurse is preparing to administer a medication to a patient on a ward. In order to correctly identify the patient, the nurse should verify the patient’s:
   a. Room and bed number
   b. Name and bed number
   c. Bed number and diagnosis
   d. Name and medical record number

2. Which of the following is an acceptable order?
   a. Dilantin 300 mg IV
   b. Lovenox 30 mg BID
   c. Regular insulin 10 units SQ BID
   d. MS 2 mg IV every 2 hours PRN pain

3. A prescriber writes the following order: “Digoxin 125 mcg PO QD”. The nurse should:
   a. Complete an online Patient Safety Net Event Report
   b. Have the prescriber correct the order, then note the order
   c. Note the order then notify the prescriber to correct the order
   d. Note the order then transcribe the order to the medication administration record (MAR)

4. Which of the following is an acceptable abbreviation?
   a. mL
   b. .5 mg
   c. MSO4
   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. Medications that can be crushed include:
   a. Capsules
   b. Scored solid tablets
   c. Sustained-release medications
   d. All of the above
7. Which of the following pills can be altered in order to give a partial dose?
   a. Scored tablet
   b. Enteric coated
   c. Gel-filled capsule
   d. Non-scored extended release tablet

8. A patient has an order for Verapamil 240 mg via NGT. The nurse removes Verapamil from the patient’s cassette and crushes it. The nurse looks at the packaging prior to administering the medication and notes that the package is labeled Verapamil HCl ER 240 mg. The nurse should:
   a. Give the medication because it is already crushed
   b. Ask the physician to change the order to Verapamil 240 mg ER via NGT
   c. Not give the medication and get the right dose and formulation from the pharmacy
   d. Give the medication and document the discrepancy on the Medication Administration Record

9. A patient has an order for Dilantin 15 mg PO TID. The nurse retrieves the following from the patient’s cassette:

   ![Dilantin Image]

   The nurse should:
   a. Request pharmacy send up ready-to-give formulation
   b. Empty the contents of the capsule into an ounce of applesauce and give the entire ounce of the applesauce
   c. Empty half the contents of the capsule into an ounce of applesauce and give the entire ounce of the applesauce
   d. Empty contents of the capsule into a medicine cup. Add 30 mL water and mix. Draw up and administer 15 mL.

10. Epinephrine and ephedrine 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

11. Medications that have a higher risk of causing significant harm when they are used in error are called:
    a. Adverse medications
    b. Black box medications
    c. High alert medications
    d. Look alike/sound alike medications
12. What strategy is commonly used to prevent errors involving high alert medications?
   a. Use of tall man lettering on medication labels
   b. Performance of an independent double check prior to administration
   c. Issuance of a warning by the FDA about their dangerous side effects
   d. Restricting the use of high alert medications to patients on cardiac monitors

13. The use of tall man lettering on medication labels and administration records is a common strategy used for which of the following:
   a. High alert medications
   b. Look alike medications
   c. Medications with black box warnings
   d. Medications frequently involved in medication errors

14. Once a multidose vial is opened or punctured, The Joint Commission requires that the vial be labeled with the:
   a. Revised expiration date
   b. Date the vial was opened
   c. Time the vial was opened
   d. Manufacturer’s expiration date

15. In general, once a multidose vial has been opened or punctured, the vial must be discarded after how many days?
   a. 3 days
   b. 14 days
   c. 28 days
   d. 30 days

16. When withdrawing medication from an ampule, the nurse must use a(n):
   a. Oral syringe
   b. Blunt needle
   c. Filter needle
   d. 22 micron filter

17. Refrigerators storing vaccines must have their temperature checked and recorded how often?
   a. Every eight hours
   b. Once a day
   c. Twice a day
   d. Once a week

PLEASE CHECK YOUR ANSWERS TO THE STUDY QUESTIONS
MEDICATION SAFETY
Answers to Study Questions

1. d  
2. c  
3. b  
4. a  
5. c  
6. b  
7. a  
8. c  
9. a  
10. c  
11. c  
12. b  
13. b  
14. a  
15. c  
16. c  
17. c  

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 2. Metric Equivalents.

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

<table>
<thead>
<tr>
<th>VOLUME</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 liter (L)</td>
<td>= 1000 milliliters (mL) or</td>
</tr>
<tr>
<td></td>
<td>1000 cubic centimeters (cc)*</td>
</tr>
<tr>
<td>1 milliliter (mL)</td>
<td>= 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 depends 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 3. 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.

\[ 0.5 \text{ gm} \times 1000 = 500 \text{ mg} \]

Table 4. 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.

\[ 2500 \text{ mL} \div 1000 = 2.5 \text{ L} \]

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 5. 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:

\[
\text{Lidocaine } 2\% = \frac{2 \text{ gm}}{100 \text{ mL}} = \frac{1 \text{ gm}}{50 \text{ mL}}
\]

\[
\text{D}_{10}\text{W} = \frac{10 \text{ gm}}{100 \text{ mL}} = \frac{1 \text{ gm}}{10 \text{ mL}}
\]

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

**Table 6. Changing Percent (%) to Fraction.**

1. Drop the % sign.
2. Write the number as the numerator.
3. Write 100 as the denominator.
4. Reduce to lowest terms

**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**
MEDICATION CALCULATION
Study Questions - Metric Units of Measure and Equivalents

Complete the following questions.

1. How many micrograms (mcg) are in a milligram (mg)? __________
2. How many milliliters (mL) are in a liter (L)? __________
3. Which is larger?
   a. gm
   b. kg
4. Which is smaller?
   a. mg
   b. mcg
5. What is the concentration of Calcium Gluconate 10%?
   a. 10 mg/100 mL
   b. 10 mg/1 L
   c. 10 gm/100 mL
   d. 10 gm/1 L

Convert the following metric measures:

6. 420 mL = __________L
7. 120 mg = __________gm
8. 2 kg = __________gm
9. 0.05 gm = __________mg = __________mcg
10. 800 mcg = __________mg
11. 10 cc = __________mL
12. 6.7 L = __________mL
13. 0.7 mg = __________mcg
14. 35 mg = __________gm
15. 1.2 gm = __________mg

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

1. 1000
2. 1000
3. b
4. b
5. c
6. 0.42 L
7. 0.12 gm
8. 2000 gm
9. 50 mg = 50,000 mcg
10. 0.8 mg
11. 10 mL
12. 6700 mL
13. 700 mcg
14. 0.035 gm
15. 1200 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. 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 7. Medication Preparations: Example.</th>
</tr>
</thead>
<tbody>
<tr>
<td>One medication may come in a tablet and liquid preparation.</td>
</tr>
<tr>
<td>Tablet = 250 mg tablet</td>
</tr>
<tr>
<td>Liquid = 250 mg/5 mL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 8. 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:**

\[
\begin{align*}
(D) & \quad 600 \text{ mg} & \times & \quad (Q) \quad 1 \text{ tab} & = & \quad X \\
(H) & \quad 300 \text{ mg} & & & & \\
\end{align*}
\]

**Step 4:**

\[
\begin{align*}
600 \text{ mg} & \times 1 \text{ tab} = 2 \text{ tabs} \\
300 \text{ mg} & \\
\end{align*}
\]

**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:**

\[
\begin{align*}
(D) & \quad 25 \text{ mcg} & \times & \quad (Q) \quad 1 \text{ tab} & = & \quad X \\
(H) & \quad 50 \text{ mcg} & & & & \\
\end{align*}
\]

**Step 4:**

\[
\begin{align*}
25 \text{ mcg} & = \frac{1}{2} \text{ tab} \\
50 \text{ mcg} & \\
\end{align*}
\]

**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:**

\[
\begin{align*}
(D) & \quad 50 \text{ mEq} & \times & \quad (Q) \quad 15 \text{ mL} & = & \quad X \\
(H) & \quad 20 \text{ mEq} & & & & \\
\end{align*}
\]

**Step 4:**

\[
\begin{align*}
50 \text{ mEq} & \times 15 \text{ mL} = \frac{75}{2} = 37.5 \text{ mL} \\
20 \text{ mEq} & \\
\end{align*}
\]
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. Expression of a Ratio.

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

<table>
<thead>
<tr>
<th>250</th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Read as 250 is to 1 as 500 is to 2

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).

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".

Ratio and proportion can be used to calculate dosages when only one complete ratio is known and the second is incomplete. 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.
X 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:*

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

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

*Example (fraction):*

\[
\text{Order: 150 mg}\quad \text{Available: 100 mg/2 mL}
\]

\[
\begin{array}{c}
100 \text{ mg} \\
2 \text{ mL}
\end{array}
= 
\begin{array}{c}
150 \text{ mg} \\
x \text{ mL}
\end{array}
\]

*Example (ratio):*

\[
\text{Order: 150 mg}\quad \text{Available: 100 mg/2 mL}
\]

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

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

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

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

\[ 300X = 600 \]

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: \[
\begin{align*}
50 \text{ mcg} & \quad = \quad 25 \text{ mcg} \\
1 \text{ tab} & \quad X \text{ tab}
\end{align*}
\]

Step 4: Cross multiply and solve for X

\[
\begin{align*}
50 \text{ mcg} & \quad = \quad 25 \text{ mcg} \\
1 \text{ tab} & \quad X \text{ tab}
\end{align*}
\]

\[
\begin{align*}
50X & \quad = \quad 25 \\
50 & \quad 50
\end{align*}
\]

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

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: \[
\begin{align*}
20 \text{ mEq} & \quad = \quad 50 \text{ mEq} \\
15 \text{ mL} & \quad X \text{ mL}
\end{align*}
\]

Step 4: Cross multiply and solve for X

\[
\begin{align*}
20 \text{ mEq} & \quad = \quad 50 \text{ mEq} \\
15 \text{ mL} & \quad X \text{ mL}
\end{align*}
\]

\[
\begin{align*}
20X & \quad = \quad 750 \\
20 & \quad 20
\end{align*}
\]

\[
X \quad = \quad 37.5 \text{ mL}
\]

PLEASE COMPLETE THE STUDY QUESTIONS ON THE 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. 15 mg of medication is ordered by the physician to be given p.o. Available are 10 mg scored tablets. How many tablets will the nurse administer?

2. 3000 units of medication are ordered to be given as a subcutaneous injection. Available is a vial containing 6000 units per 1.2 mLs. How many mLs will the nurse administer?

3. Available is 250 mg/5 mL syrup. The physician orders 0.75 gm p.o. How many mLs will the nurse administer?

4. 30 mEq of a liquid medication is ordered to be given p.o. Available is 20 mEq/15 mL. How many mLs will the nurse administer?

5. 120 mcg of medication is ordered. On hand is a liquid suspension of 0.06 mg/mL. How many mLs will the nurse administer?

6. 250,000 units of a medication is ordered IM. On hand is 100,000 units per mL. How many mLs will the nurse draw up?

7. \( \text{Order:} \ 2 \text{ gm} \)
   \( \text{Available:} \ 500 \text{ mg/mL} \)
   How many mLs will the nurse administer?

8. \( \text{Order:} \ 80 \text{ mg} \)
   \( \text{Available:} \ 160 \text{ mg/5 mL} \)
   How many mLs will the nurse administer?

9. \( \text{Order:} \ 0.6 \text{ mg} \)
   \( \text{Available:} \ 50 \text{ mcg/mL} \)
   How many mLs will the nurse administer?

10. \( \text{Order:} \ 0.5 \text{ gm} \)
    \( \text{Available:} \ 500 \text{ mg/mL} \)
    How many mLs will the nurse administer?

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

1. 1.5 tabs
2. 0.6 mL
3. 15 mL
4. 22.5 mL
5. 2 mL
6. 2.5 mL
7. 4 mL
8. 2.5 mL
9. 12 mL
10. 1 mL

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 fill in the blank, not multiple choice. You may use a calculator when completing the test. Metric equivalencies and dimensional analysis formula will be provided.
BIBLIOGRAPHY


Van den Bemt, P. M., Cusell, M. B., Overbeeke, P. W., Trommelen, M., Van Dooren, D., & Ophorst, W. R. (2006). Quality improvement of oral medication administration in patients with enteral feeding tube. *Quality and Safety in Health Care, 15*, 44-47. Retrieved from [http://qshc.bmj.com/cgi/content/full/15/1/44#BIBL](http://qshc.bmj.com/cgi/content/full/15/1/44#BIBL).


Objectives:

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

1. Demonstrate the initial steps to take during a Code Blue.
2. Discuss the roles of team members during a Code Blue.
3. Describe nursing responsibilities during a Code Blue.
4. Prepare the patient for monitoring and defibrillating.

I. Introduction

This section focuses on the role of the nurse during an emergency, specifically during a cardiac arrest. The percentage of patients who survive to hospital discharge following cardiac arrest while in the hospital is low and ranges from 6 to 15% (Podrid & Cheng, 2010).

In order to give the patient the best chance to survive cardiac arrest with intact neurologic function, nursing staff must act quickly to:

- Determine pulselessness
- Call for Help
- Give effective compressions and ventilations
- Prepare the patient for manual defibrillation or use the Automated External Defibrillator (AED) per hospital policy.

Staff members must also work together as a team to simultaneously perform the necessary interventions to give the patient a chance for the best outcome possible (American Heart Association, 2011).

II. American Heart Association (AHA) Cardiopulmonary Resuscitation (CPR) Guidelines

A. The AHA updated its CPR guidelines in 2010 and has changed the sequencing of the steps for CPR (American Heart Association, 2011). Compressions were often delayed using the former Airway-Breathing-Circulation (“ABC”) sequence. The new guidelines recommend that compressions be done first, followed by checking the airway and delivering breaths (“CAB”). The steps that healthcare providers are to perform upon discovery of an unresponsive person are:
1. **Check for responsiveness**
   a. Tap and shout, “Are you all right?”
   b. Scan the chest for 5-10 seconds to look for absent or abnormal breathing (no breathing, or gasping only).

2. **If no response call for help**
   a. The nurse should call for help and for the crash cart.
   b. Nursing staff members need to know the facility-specific number to call for a Code Blue.

3. **Check pulse** for 5-10 seconds

4. **If no pulse, begin compressions**
   a. Hand placement:
      - Adults: Use both hands placing the heel of one on the lower half of the sternum, in the middle of the chest. The heel of the other hand should be placed on top of the first.
      - Children: Use one or two hands depending on the size of the child
      - Infants: Use two fingers just below the nipple line or use 2 thumb-encircling hands technique
   b. Give compressions hard and fast
      1. At least 100 compressions per minute
      2. Depth
         - Adults: At least 2 inches
         - Children: Approximately 2 inches (at least one third the depth of the chest)
         - Infants: Approximately 1 ½ inches (at least one third the depth of the chest)
      3. Allow chest to recoil after each compression
      4. Minimize interruption in compressions
   c. Give 30 compressions (15 if performing 2 person CPR for a child or infant).

5. **Open the airway** with head tilt, chin lift technique.

6. **Give 2 breaths** with a Bag-Valve-Mask (BVM) or a mouth-to-mask device
7. **Continue CPR for 2 minutes** (5-6 cycles)

8. **Check pulse**

9. **Continue CPR if there is no pulse.** Change compressors if possible

B. Compression to Ventilation ratios:

1. Adults: 30:2

2. Children & Infants:
   - 1 person: 30:2
   - 2 person: 15:2

III. The Team

A. A nurse from the patient’s unit acts as the time leader (until the Code Blue team/responders arrive) and assigns the following tasks:

   - Performing compressions
   - Performing ventilations with BVM
   - Recording/documenting
   - Placement of the patient on the monitor/defibrillator
   - Starting an intravenous line and administering medications as ordered by the physician

B. Once help arrives, members of the healthcare team work together to perform various roles in order to ensure that all necessary interventions are done in a timely manner. The team is composed of both nursing staff from the patient’s unit, as well as the members of the Code Blue team/responders.

C. Members of the Code Blue team/responders include a physician and a critical care nurse, and also may include a respiratory therapist and an EKG technician. The Code Blue team/responders take responsibility for running the code and for performing many of the interventions including defibrillation, but the nurses from the patient’s unit should remain with the patient and assist team.

IV. Nursing Responsibilities include:

A. Noting the time CPR is initiated

B. Ensuring that compressions are being given at the proper rate and depth and that a back board has been placed under the patient

C. Ensuring that ventilations are being performed correctly, are resulting in adequate chest rise, and that the BVM is attached to oxygen at 15 liters per minute

D. Staying with the patient throughout the course of the Code Blue, and not leaving once the Code Blue team/responders arrive

E. Preparing the patient for monitoring and defibrillation by the Code Blue team/responders
1. Take defibrillator pads out of package

2. Peel off sticky backing, place pads on patient’s bare chest and smooth pads to ensure full contact. It is helpful to use the pictures on the pads to guide placement. Use one of the following pad placement techniques:

- One pad to the upper right chest to the right of the sternum below the clavicle
- The other to the left of the nipple, with the top margin of the pad a few inches below the left armpit (American Heart Association, 2011)

   ![Picture from Resuscitation Central](image1)

   OR

- One pad is placed on the front of the chest to the left of the sternum below the nipple
- The other is placed on the back to the left of the spine and below the scapula (Resuscitation Central, 2010)

   ![Picture from Resuscitation Central](image2)
3. Attach the pads to the cable

4. Attach the cable to the monitor/defibrillator

5. Turn on the monitor/defibrillator per hospital protocol
   
   a. In some facilities, the “monitor” should be turned to “on”

   b. In other facilities, the monitors/defibrillators have an “Automated External Defibrillator” function, and the machine should be turned on to AED mode. The nurse should then follow the verbal prompts.

F. Obtaining/ensuring IV access.

G. Administering IV medications per verbal order by the physician (RN only). Nurses should check hospital policy for which medications may be given by the unit nurse, and which ones must be given the Code Blue team nurse or a critical care nurse.

H. Ensuring suction is working and hooked up

I. Recording all events of the code. The recorder must pay close attention to all treatments and medications that are given during the code and record the following and the time they occur:

   ● Start of code
   
   ● Name and dose of all medications that are given
   
   ● Defibrillation and number of joules
   
   ● Procedures, such as intubation, chest tube insertion, and central line insertion
   
   ● Cardiac rhythm when CPR is stopped for pulse and rhythm check (e.g., Ventricular Fibrillation, Ventricular Tachycardia, Pulseless Electrical Activity (PEA), Asystole)
   
   ● Return of pulse and Vital signs
   
   ● Time code is stopped

V. Conclusion

Nurses play a crucial role in promoting good outcomes post cardiac arrest. Nurses are responsible not only for providing prompt, high-quality CPR upon discovery of cardiac arrest, but also for leading the team to ensure quality compressions and ventilations, preparation for early defibrillation, and assisting the Code Blue team/responders upon their arrival.
REFERENCES


2012 DHS Inpatient Annual Core Competency Program  
(Nursing): Licensed in a Patient Care Area 
ROLE IN AN EMERGENCY: 
THE DETERIORATING SEPTIC PATIENT 
Clinical Competency Description 

**Competency Statement:** Demonstrates understanding of identification of sepsis, initial interventions once sepsis is identified, and the nurse’s role during a Code Blue.

<table>
<thead>
<tr>
<th>Critical Behaviors</th>
<th>Learning Activities</th>
<th>Method of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbalizes 3 indicators of sepsis.</td>
<td>Reviews the following: “Role in an Emergency” and “Early Sepsis Diagnosis and Treatment” in the <em>Inpatient Annual Core Competency Study Guide (Nursing) 2012: Licensed.</em></td>
<td>Completes the Role in an Emergency: The Deteriorating Septic Patient Performance Checklist with 100% accuracy.</td>
</tr>
<tr>
<td>Verbalizes 4 initial interventions for sepsis.</td>
<td>Role in an Emergency: The Deteriorating Septic Patient</td>
<td></td>
</tr>
<tr>
<td>Demonstrates initial steps to be taken during a Code Blue.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates 4 steps for preparing the patient for monitoring and defibrillation using the pads.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>States 3 responsibilities of the RN or LVN during a code blue (not including performing CPR and placing the patient on the monitor/defibrillator).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 2012 DHS Inpatient Annual Core Competency Program
(Nursing): Licensed in a Patient Care Area

### ROLE IN AN EMERGENCY:
THE DETERIORATING SEPTIC PATIENT
Performance Checklist

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Met</th>
<th>Not Met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbalizes 3 indicators of sepsis.</td>
<td></td>
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<tr>
<td>Demonstrates initial steps to be taken during a Code Blue.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Checks for responsiveness</td>
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<td></td>
</tr>
<tr>
<td>- Taps and shouts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Looks for chest movement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Calls for help</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Checks for pulse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Shows proper hand placement for compressions (mid chest)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Opens the airway (head tilt, chin lift)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- States 2 breaths would be given</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates 4 steps for preparing the patient for monitoring and defibrillation using the pads</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Takes the hands free pads out of the package and simulates placing the pads as follows:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Below the clavicle, right of the sternum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Left of the nipple, with the top margin a few inches below the left armpit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- On the front of the chest to the left of the sternum below the nipple</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- On the back to the left of the spine and below the scapula</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Attaches pads to the cable (or states attaching pads to cable)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- States attaching cable to monitor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Indicates on photograph where to turn on the monitor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note: Order may vary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>States 3 responsibilities of the RN or LVN during a code blue (not including performing CPR and placing the patient on the monitor/defibrillator).</td>
<td></td>
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</tr>
</tbody>
</table>
## MEDICATION SAFETY

### Clinical Competency Description

**Competency Statement:** Demonstrates safe and appropriate knowledge for medication administration including adverse effects.

<table>
<thead>
<tr>
<th>Critical Behaviors</th>
<th>Learning Activities</th>
<th>Method of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifies the appropriate devices used for the preparation and/or administration of medications.</td>
<td>Reviews the following:</td>
<td>Completes Medication Administration Performance Checklist with 100% accuracy.</td>
</tr>
<tr>
<td></td>
<td>DHS and facility specific policies/procedures/protocols related to medication administration</td>
<td></td>
</tr>
<tr>
<td>Identifies one medication whose side effects can potentially increase fall risk.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifies one solid oral medication that can be altered by cutting in order to administer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifies one solid oral medication that can be altered by crushing in order to administer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifies one medication that requires an independent double check.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2012 DHS Inpatient Annual Core Competency Program  
(Nursing): Licensed in a Patient Care Area  
MEDICATION SAFETY  
Performance Checklist

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Met</th>
<th>Not Met</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifies the appropriate devices used for the preparation and/or administration of medications.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Given photographs of 5 medications and 6 devices/accessories, identifies the appropriate device/s used for the preparation and/or administration of 4 out of 5 medications.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifies 1 medication whose side effects can potentially contribute to falls.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Identifies solid oral medications that can be altered by cutting in order to administer.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Given photographs of 5 solid oral medications (e.g., tablets, capsules) identifies 1 that can be cut or altered in order to give a partial dose.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Identifies solid oral medications that can be altered by crushing in order to administer.</td>
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<tr>
<td>Given photographs of 5 solid oral medications (e.g., tablets, capsules) identifies 1 that can be crushed prior to administration.</td>
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<tr>
<td>Identifies 1 medication that requires an independent double check.</td>
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<tr>
<td>Given photographs of 5 medications, identifies 1 medication that requires an independent double check.</td>
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