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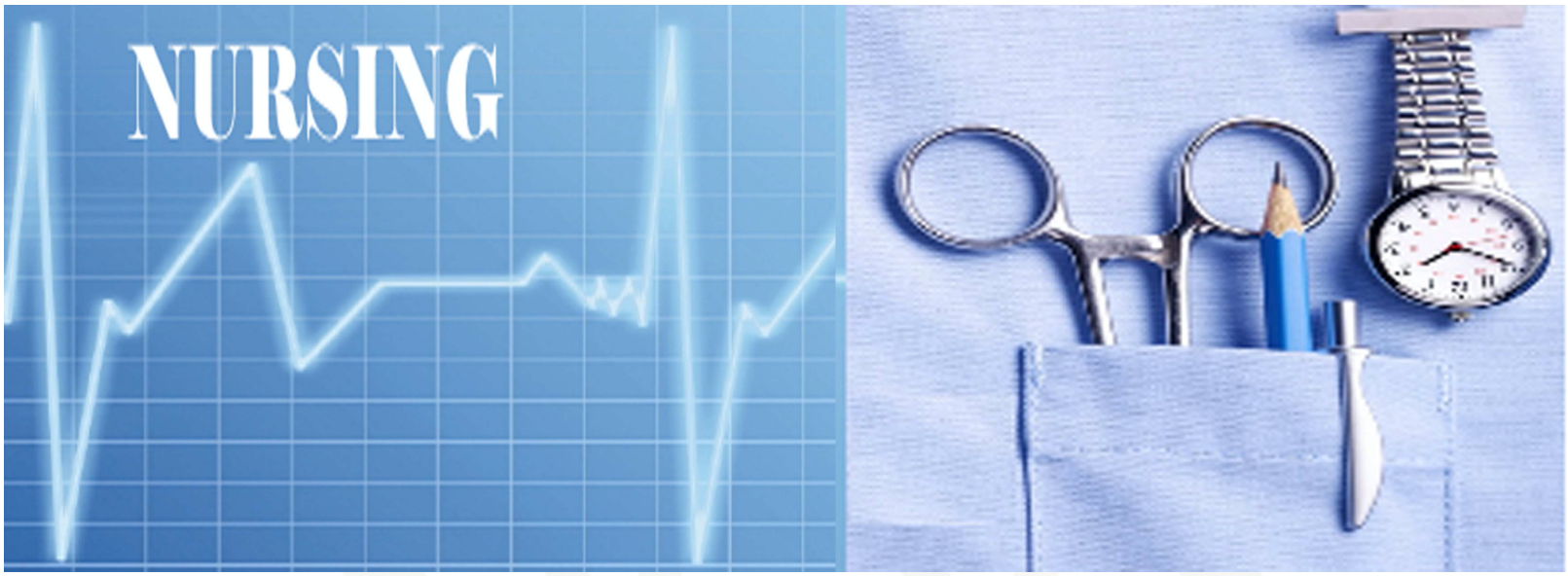

Skills Laboratory Manual in PEDIATRIC HEALTH NURSING (NRS 364)

Document Revision Control History

Author	Revision No.	Description	Reviewed by	Approved by	Release Date
Dr. Jestoni D. Maniago	3	Update of contents	Dr. Brian A. Vasquez	Department Council	11 February 2021
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	1				

NRS 364: Pediatric Health Nursing - Practical

Unit No.	Topics	Procedure / Skills to be Performed
1	**Orientation**	• Course Grading System • Laboratory rules
2	**Asepsis and Infection Control**	• Performing hand hygiene using soap and water • Using personal protective equipment
3	**Vital Signs**	• Assessing body temperature • Assessing peripheral pulse by palpation • Assessing apical pulse by auscultation • Assessing respiration
4	**Growth Parameter Assessment**	• Using the Growth Record • Observing the child and noting clinical signs of marasmus and kwashiorkor • Measuring weight • Measuring length or height • Determining BMI (Body Mass Index)
5	**Safety**	• Holding a newborn/ infant • Applying an extremity restraint • Applying a waist restraint • Applying an elbow restraint • Applying a mummy restraint
6	**Nutrition**	• Inserting a nasogastric (NG) tube • Administering a tube feeding • Removing a nasogastric tube
7	**Medications**	• Administering oral medications • Administering an intradermal injection • Administering a subcutaneous injection • Administering an intramuscular injection • Administering IV medications • Instilling eye drops • Instilling ear drops • Instilling nose drops • Administering rectal suppository
8	**Oxygenation**	• Administering oxygen by nasal cannula • Administering oxygen by mask • Using an oxygen tent • Suctioning the nasopharyngeal and oropharyngeal airways
9	**Bathing the infant**	• Bathing an infant or small child • Sponge bath to reduce hyperthermia
10	**Laboratory Specimen Collection**	• Obtaining a specimen for urinalysis • Obtaining a stool specimen • Collection of blood specimen • Obtaining a throat culture
Assessment Tools • Checklist • Rubric • Exercise/ Worksheet		

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1. Orientation

Course Grading System (2nd Semester, 1441-1442)

Course Code: NRS 364
Course Name: Pediatric Health Nursing / Practical

A. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy Table.

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge**		
K.3.1	Discuss appropriate nursing care plan related care to children.	Lecture-demonstration	Practical Exam, Assignment, Case Presentation
K.3.2	Recognize principle of nursing intervention for children.	Lecture-demonstration	Practical Exam, Assignment, Case Presentation
2.0	**Skills**		
S.2.1	Demonstrate therapeutic, age appropriate, culturally sensitive communication techniques when providing care to pediatric patients and their families.	Lecture-demonstration	Practical Exam
S.4.1	Perform common nursing skills needed for providing care to children in sickness and health.	Lecture-demonstration	Practical Exam
3.0	**Competence**		
C.1.1	Measure outcomes for effectiveness and achievement of nursing activities through apply the nursing process for children.	Lecture-demonstration	Practical Exam, Rubric for Professionalism

B. Schedule of Assessment Tasks for Students during the Semester Table.

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Practical Exam 1	6th week	15%
2	Practical Exam 2	12th week	15%
3	Assignment	12thweek	15%
4	Professionalism	1st - 14th week	5%
5	Case Presentation	11th week	10%
6	Final Practical Exam	15th week	40%

C. Summary of POs and CLOs Table.

PO's	1. Knowledge		2. Skills		3. Competence
	K3		S2	S4	C1
CLO's	K3.1	K3.2	S2.1	S4.1	C1.1
KPI	KPI 04	KPI 37	KPI 12	KPI 31	KPI 09

D. Summary of CLO's and Assessment Tasks Table

Assessment Tasks	CLO's					Total Assessment marks
	K3.1	K3.2	S2.1	S4.1	C1.1	
Practical Exam 1	**2**	**2**	**5**	**4**	**2**	**15**
Proc. 1	1	1	2	2	1	7
Proc. 2	1	1	3	2	1	8
Practical Exam 2	**2**	**2**	**5**	**4**	**2**	**15**
Proc. 1	1	1	2	2	1	7
Proc. 2	1	1	3	2	1	8
Assignment	**8**	**7**				**15**
Professionalism					**5**	**5**
Case Presentation	**5**	**5**				**10**
Final Practical Exam	**3**	**3**	**15**	**15**	**4**	**40**
Proc. 1	1	1	3	3	2	10
Proc. 2	1	1	6	6	1	15
Proc. 2	1	1	6	6	1	15
Total ►	**20**	**20**	**25**	**23**	**13**	**100**

Rules When Using the Nursing Skills Laboratory

1. Students must wear closed-toe shoes (appropriate footwear) when in the laboratory. All students must wear the designated uniform (specified solid navy blue scrubs and white laboratory coats) with ID badges in all skills demonstration activities. Each student should be mindful of their hygiene and body grooming.
2. No eating or drinking inside the laboratory.
3. Proper hand hygiene is an important part of nursing practice. Alcohol-based hand sanitizers are available for use.
4. No products in the laboratory are safe for human ingestion, injection or infusion (via skin, oral, and intravenous routes). Products and supplies in the Nursing Skills Laboratory are intended for teaching purposes only and are not safe for human or animal use.
5. Mannequins should be treated like “REAL” patients. Please ask your course instructor for any questions regarding mannequin use.
6. Mannequins may have IV bags of simulated blood attached to them. Please be aware of these when moving the mannequins into other positions.
7. Students should not use ink pens or markers at the patient bedsides. These items will permanently stain the mannequins.
8. Providone Iodine (Betadine) and Chloraprep swabs will also permanently stain the mannequins. Do not use any of these products that might come in any of the laboratory kits. Please simulate using these items.
9. Students are expected to leave the Skills Laboratory in good condition. Please return all supplies to the area you found them. Properly dispose all sharps and trash. Sharps are to be placed in sharps boxes or containers after use. No re-capping or reusing needles or IV catheters. Please dispose these items in the sharps containers.
10. No equipment or supplies may be taken out of the Nursing Skills Laboratory without approval.

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2. Asepsis and Infection Control

Performing Hand Hygiene Using Soap and Water (Handwashing)

Handwashing remains the best method to decontaminate hands. Handwashing, as opposed to hand hygiene with an alcohol-based rub, is required (CDC, 2002a):

- When hands are visibly dirty
- When hands are visibly soiled with or in contact with blood or other body fluids
- Before eating and after using the restroom
- If exposure to certain organisms, such as those causing anthrax or *Clostridium difficile,* is known or suspected. (Other agents have poor activity against these organisms.)

Equipment

- Antimicrobial or non-antimicrobial soap (if in bar form, soap must be placed on a soap rack)
- Paper towels
- Oil-free lotion (optional)

Action	Rationale
1. Gather the necessary supplies. Stand in front of the sink. Do not allow your clothing to touch the sink during the washing procedure (Figure 1).	The sink is considered contaminated. Clothing may carry organisms from place to place.
2. Remove jewelry, if possible, and secure in a safe place. A plain wedding band may remain in place.	Removal of jewelry facilitates proper cleansing. Microorganisms may accumulate in settings of jewelry. If jewelry was worn during care, it should be left on during handwashing.
3. Turn on water and adjust force (Figure 2). Regulate the temperature until the water is warm.	Water splashed from the contaminated sink will contaminate clothing. Warm water is more comfortable and is less likely to open pores and remove oils from the skin. Organisms can lodge in roughened and broken areas of chapped skin.

FIGURE 1. Standing in front of sink.

FIGURE 2. Turning on the water at the sink.

4. Wet the hands and wrist area. Keep hands lower than elbows to allow water to flow toward fingertips (Figure 3).

Water should flow from the cleaner area toward the more contaminated area. Hands are more contaminated than forearms.

5. Use about 1 teaspoon liquid soap from dispenser or rinse bar of soap and lather thoroughly (Figure 4). Cover all areas of hands with the soap product. Rinse soap bar again and return to soap rack.

Rinsing the soap before and after use removes the lather, which may contain microorganisms.

FIGURE 3. Wetting hands to the wrist.

FIGURE 4. Lathering hands with soap and rubbing with firm circular motion.

6. With firm rubbing and circular motions, wash the palms and backs of the hands, each finger, the areas between the fingers (Figure 5), and the knuckles, wrists, and forearms. **Wash at least 1 inch above area of contamination.** If hands are not visibly soiled, wash to 1 inch above the wrists (Figure 6).

Friction caused by firm rubbing and circular motions helps to loosen dirt and organisms that can lodge between the fingers, in skin crevices of knuckles, on the palms and backs of the hands, and on the wrists and forearms. Cleaning less contaminated areas (forearms and wrists) after hands are clean prevents spreading microorganisms from the hands to the forearms and wrists.

7. Continue this friction motion for at least 15

Length of handwashing is determined by degree of

seconds.

contamination.

8. Use fingernails of the opposite hand or a clean orangewood stick to clean under fingernails (Figure 7).

Area under nails has a high microorganism count, and organisms may remain under the nails, where they can grow and be spread to other persons.

9. Rinse thoroughly with water flowing toward fingertips (Figure 8).

Running water rinses microorganisms and dirt into the sink.

FIGURE 5. Washing areas between fingers.

FIGURE 6. Washing to 1 inch above the wrist.

10. Pat hands dry with a paper towel, beginning with the fingers and moving upward toward forearms, and discard it immediately. Use another clean towel to turn off the faucet. Discard towel immediately without touching other clean hand.

Patting the skin dry prevents chapping. Dry hands first because they are considered the cleanest and least contaminated area. Turning the faucet off with a clean paper towel protects the clean hands from contact with a soiled surface.

FIGURE 7. Using fingernails to clean under nails of opposite hand.

FIGURE 8. Rinsing hands under running water with water flowing toward fingertips.

11. Use oil-free lotion on hands if desired.

Oil-free lotion helps to keep the skin soft and prevents chapping. It is best applied after patient care is complete and from small, personal containers. Oil-based lotions should be avoided because they can cause deterioration of gloves.

Using personal protective equipment

Personal protective equipment refers to specialized clothing or equipment worn by an employee for protection against infectious materials. PPE is used in healthcare settings to improve personnel safety in the healthcare environment through the appropriate use of PPE (CDC, 2004a). This equipment includes clean (unsterile) and sterile gloves, impervious gowns/aprons, surgical and high-efficiency particulate air (HEPA) masks, N95 disposable masks, face shields, and protective eyewear/goggles.

Understanding the potential contamination hazards related to the patient's diagnosis and condition and the institutional policies governing PPE is very important. The type of PPE used will vary based on the type of exposure anticipated and category of precautions: Standard Precautions and Transmission-Based Precautions, including Contact, Droplet, or Airborne Precautions. It is the nurse's responsibility to enforce the proper wearing of PPE during patient care for members of the healthcare team.

Equipment

- Gloves
- Mask (surgical or particulate respirator)
- Impervious gown
- Protective eyewear (does not include eyeglasses)

Action	Rationale
1. Check medical record and nursing plan of care for type of precautions and review precautions in infection control manual.	Mode of transmission of organism determines type of precautions required.
2. Plan nursing activities before entering patient's room.	Organization facilitates performance of task and adherence to precautions.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.
4. Provide instruction about precautions to patient, family members, and visitors.	Explanation encourages cooperation of patient and family and reduces apprehension about precaution procedures.
5. Put on gown, gloves, mask, and protective eyewear, based on the type of exposure anticipated and category of isolation precautions.	Use of PPE interrupts chain of infection and protects patient and nurse. Gown should protect entire uniform. Gloves protect hands and wrists from microorganisms. Masks protect nurse or patient from droplet nuclei and large-particle aerosols. Eyewear protects mucous membranes in the eye from splashes.

a. Put on the gown, with the opening in the back. Tie gown securely at neck and waist (Figure 1).	Gown should fully cover the torso from the neck to knees, arms to the end of wrists, and wrap around the back.
b. Put on the mask or respirator over your nose, mouth, and chin (Figure 2). Secure ties or elastic bands at the middle of the head and neck. If respirator is used, perform a fit check. Inhale; the respirator should collapse. Exhale; air should not leak out.	Masks protect nurse or patient from droplet nuclei and large- particle aerosols. A mask must fit securely to provide protection.
c. Put on goggles (Figure 3). Place over eyes and adjust to fit. Alternately, a face shield could be used to take the place of the mask and goggles (Figure 4).	Eyewear protects mucous membranes in the eye from splashes. Must fit securely to provide protection.
d. Put on clean disposable gloves. Extend gloves to cover the cuffs of the gown (Figure 5).	Gloves protect hands and wrists from microorganisms.

FIGURE 1. Tying gown at neck and waist.

FIGURE 2. Applying mask applied over nose, mouth, and chin.

FIGURE 3. Putting on goggles.

FIGURE 4. Putting on face shield.

6. Identify the patient. Explain the procedure to the patient. Continue with patient care as appropriate.

Patient identification validates the correct patient and correct procedure. Discussion and explanation help allay anxiety and prepare the patient for what to expect.

FIGURE 5. Putting on gloves, ensuring gloves cover gown cuffs.

Remove PPE

7. Remove PPE: Except for respirator, remove PPE at the doorway or in an anteroom. Remove respirator after

Proper removal prevents contact with and the spread of microorganisms. Outside front of equipment is considered contaminated. The inside, outside back, ties on head and back, are considered clean, which are areas of PPE that are

leaving the patient room and closing door.	not likely to have been in contact with infectious organisms.
a. If impervious gown has been tied in front of the body at the waistline, untie waist strings before removing gloves.	Front of gown, including waist strings, are contaminated. If tied in front of body, the ties must be untied before removing gloves.
b. Grasp the outside of one glove with the opposite gloved hand and peel off, turning the glove inside out as you pull it off (Figure 6). Hold the removed glove in the remaining gloved hand.	Outside of gloves are contaminated.
c. Slide fingers of ungloved hand under the remaining glove at the wrist, taking care not to touch the outer surface of the glove (Figure 7).	Ungloved hand is clean and should not touch contaminated areas.
d. Peel off the glove over the first glove, containing the one glove inside the other (Figure 8). Discard in appropriate container.	Proper disposal prevents transmission of microorganisms.
e. To remove the goggles or face shield: Handle by the headband or ear pieces (Figure 9). Lift away from the face. Place in designated receptacle for reprocessing or in an appropriate waste container.	utside of goggles or face shield is contaminated. Handling by headband or ear pieces and lifting away from face prevents transmission of microorganisms. Proper disposal prevents transmission of microorganisms.
f. To remove gown: Unfasten ties, if at the neck and back. Allow the gown to fall away from shoulders. Touching only the inside of the gown, pull away from the torso. Keeping hands on the inner surface of the gown, pull from arms. Turn gown inside out. Fold or roll into a bundle and discard.	Gown front and sleeves are contaminated. Touching only the inside of the gown and pulling it away from the torso prevents transmission of microorganisms. Proper disposal prevents transmission of microorganisms.
g. To remove mask or respirator: Grasp the neck ties or elastic, then top ties or elastic and remove. Take care to avoid touching front of mask or respirator. Discard in waste container. If using a respirator, save for future use in the designated area.	Front of mask or respirator is contaminated; **Do Not Touch.** Not touching the front and proper disposal prevent transmission of microorganisms.

FIGURE 6. Grasping the outside of one glove and peeling off.

FIGURE 7. Sliding fingers of ungloved hand under the remaining glove at the wrist.

FIGURE 8. Pulling glove off the hand and over the other glove.

FIGURE 9. Removing goggles by grasping ear pieces.

8. Perform hand hygiene immediately after removing all PPE.	Hand hygiene prevents spread of microorganisms.

3. Vital Signs

Vital Signs

Vital signs are a person's temperature, pulse, **respiration,** and **blood pressure,** abbreviated as T, P, R, and BP. Pain, often called the fifth vital sign Pulse oximetry, the noninvasive measurement of arterial oxyhemoglobin saturation of arterial blood, is also often included with the measurement of vital sign. The health status of an individual is reflected in these indicators of body function. A change in vital signs may indicate a change in health.

Vital signs are assessed and compared with accepted normal values and the patient's usual patterns in a wide variety of instances. Examples of appropriate times to measure vital signs include, but are not limited to, screenings at health fairs and clinics, in the home, upon admission to a healthcare setting, when medications are given that may affect one of the vital signs, before and after invasive diagnostic and surgical procedures, and in emergency situations. Nurses take vital signs as often as the condition of a patient requires such assessment.

Careful attention to the details of vital sign procedures and accuracy in the interpretation of the findings are extremely important. Although vital sign measurement may be delegated to other healthcare personnel, it is the nurse's responsibility to ensure the accuracy of the data, interpret vital sign findings, and report abnormal findings.

AGE-RELATED VARIATIONS IN NORMAL VITAL SIGNS

Age	Temperature (°)	Pulse (beats/min)	Respirations (breaths/min)	Blood Pressure (mm Hg)
Newborn	98.2 F (36.8 C) (Axillary)	80–180	30–60	73/55
1–3 yr	99.9 F (37.7 C) (Rectal)	80–140	20–40	90/55
6–8 yr	98.6 F (37 C) (Oral)	75–120	15–25	95/75
10 yr	98.6 F (37 C) (Oral)	75–110	15–25	102/62
Teens	98.6 F (37 C) (Oral)	60–100	15–20	102/80

Assessing Body Temperature

Body temperature is the difference between the amount of heat produced by the body and the amount of heat lost to the environment, measured in degrees. Heat is generated by metabolic processes in the core tissues of the body, transferred to the skin surface by the circulating blood, and then dissipated to the environment. Core body temperature is higher than surface body temperature, and is normally maintained within a range of 97.0^{0}F (36.0^{0}C) to 99.5^{0}F (37.5^{0}C). There are individual variations of these temperatures as well as normal changes during the day, with core body temperatures being lowest in the early morning and highest in the late afternoon (Porth & Matfin, 2009).

Temperatures differ in various parts of the body; core body temperatures are higher than surface body temperatures. Core temperatures are measured at tympanic or rectal sites, but they can also be measured in the esophagus, pulmonary artery, or bladder by invasive monitoring devices. Surface body temperatures are measured at oral (sublingual), axillary, and skin surface sites.

Several types of equipment and different procedures might be used to measure body temperature. Different types of thermometers are illustrated in Figure 1. Glass thermometers should never be used to take the temperature of a person who is unconscious or irrational, or of infants and young children, because the glass could break. To obtain an accurate measurement, choose an appropriate site, the correct equipment, and the appropriate tool based on the patient's condition. If a temperature reading is obtained from a site other than the oral route, document the site used along with the measurement. If no site is listed with the documentation, it is generally assumed to be the oral route.

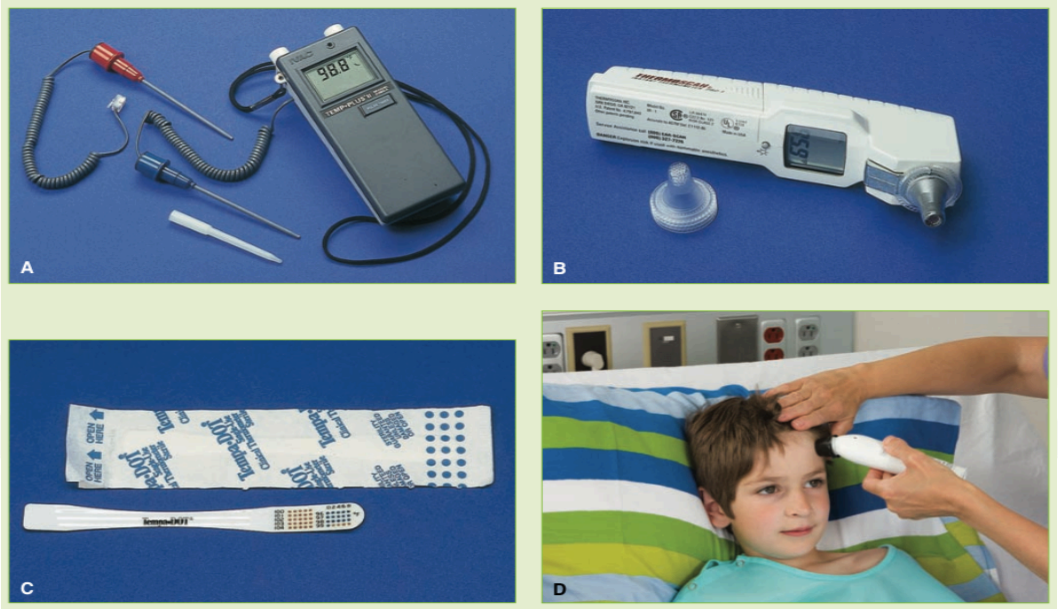


FIGURE 1. Types of thermometers. (**A**) Electronic thermometer. (**B**) Tympanic membrane thermometer. (**C**) Disposable paper thermometer; the dots change color to indicate temperature. (**D**) Temporal artery thermometer.

Equipment

- Digital, glass, or electronic thermometer, appropriate for site to be used
- Disposable probe covers
- Water-soluble lubricant for rectal temperature measurement
- Nonsterile gloves, if appropriate
- Additional **PPE,** as indicated
- Toilet tissue, if needed
- Pencil or pen, paper or flow sheet, computerized record

Action	Rationale
1. Check medical order or nursing care plan for frequency of measurement and route. More frequent temperature measurement may be appropriate based on nursing judgment.Bring necessary equipment to the bedside stand or overbed table.	Assessment and measurement of vital signs at appropriate intervals provide important data about the patient's health status. Bringing everything to the bedside conserves time and energy. Arranging items nearby is convenient, saves time, and avoids unnecessary stretching and twisting of muscles on the part of the nurse.
2. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4.Close curtains around bed and close the door to the room, if possible. Discuss the procedure with patient and assess the patient's ability to assist with the procedure.	This ensures the patient's privacy. Explanation relieves anxiety and facilitates cooperation. Dialogue encourages patient participation.
5. Ensure the electronic or digital thermometer is in working condition.	Improperly functioning thermometer may not give an accurate reading.
6. Put on gloves, if appropriate or indicated.	Gloves prevent contact with blood and body fluids. Gloves are usually not required for an oral, axillary, or tympanic temperature measurement, unless contact with blood or body fluids is anticipated. Gloves should be worn for rectal temperature measurement.

7. Select the appropriate site based on previous assessment data.	This ensures safety and accuracy of measurement.
8. Follow the steps as outlined below for the appropriate type of thermometer.	
9. When measurement is completed, remove gloves, if worn. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.

Measuring a Tympanic Membrane Temperature

10. If necessary, push the "on" button and wait for the "ready" signal on the unit.	For proper function, the thermometer must be turned on and warmed up.
11. Slide disposable cover onto the tympanic probe.	Use of a disposable cover deters the spread of microorganisms.
12. **Insert the probe snugly into the external ear using gentle but firm pressure, angling the thermometer toward the patient's jaw line. Pull pinna up and back to straighten the ear canal in a child (3 years old above)/ pull pinna down and back to straighten the ear canal in a child (3 years old below).**	If the probe is not inserted correctly, the patient's temperature may be noted as lower than normal.
13. Activate the unit by pushing the trigger button. The reading is immediate (usually within 2 seconds). Note the reading	The digital thermometer must be activated to record the temperature.
14. Discard the probe cover in an appropriate receptacle by pushing the probe-release button or use rim of cover to remove from probe. Replace the thermometer in its charger, if necessary.	Discarding the probe cover ensures that it will not be reused accidentally on another patient. Proper disposal prevents the spread of microorganisms. If necessary, the thermometer should stay on the charger so that it is ready to use at all times.

Assessing Oral Temperature

10. Remove the electronic unit from the charging unit, and remove the probe from within the recording unit.	Electronic unit must be taken into the patient's room to assess the patient's temperature. On some models, by removing the probe the machine is already turned on.
11. Cover thermometer probe with disposable probe cover and slide it on until it snaps into place.	Using a cover prevents contamination of the thermometer probe.
12. Place the probe beneath the patient's tongue in the posterior sublingual pocket. Ask the patient to close his or her lips around the probe.	When the probe rests deep in the posterior sublingual pocket, it is in contact with blood vessels lying close to the surface.
13. Continue to hold the probe until you hear a beep. Note the temperature reading.	If left unsupported, the weight of the probe tends to pull it away from the correct location. The signal indicates the measurement is completed. The electronic thermometer provides a digital display of the measured temperature.
14. Remove the probe from the patient's mouth. Dispose of the probe cover by holding the probe over an appropriate receptacle and pressing the probe release button.	Disposing of the probe cover ensures that it will not be reused accidentally on another patient. Proper disposal prevents spread of microorganisms.
15. Return the thermometer probe to the storage place within the unit. Return the electronic unit to the charging unit, if appropriate.	The thermometer needs to be recharged for future use. If necessary, the thermometer should stay on the charger so that it is ready to use at all times.

Assessing Rectal Temperature

10. Adjust the bed to a comfortable working height, usually elbow height of the care giver (VISN 8 Patient Safety Center, 2009). Put on nonsterile gloves.	Having the bed at the proper height prevents back and muscle strain. Gloves prevent contact with contaminants and body fluids.
11. Assist the patient to a side-lying position. Pull back the covers sufficiently to expose only the buttocks.	The side-lying position allows the nurse to visualize the buttocks. Exposing only the buttocks keeps the patient warm and maintains his or her dignity.
12. Remove the rectal probe from within the recording unit of the electronic thermometer. Cover the probe with a disposable probe cover and slide it into place	Using a cover prevents contamination of the thermometer.

until it snaps in place.

13. Lubricate about 1 inch of the probe with a water-soluble lubricant.	Lubrication reduces friction and facilitates insertion, minimizing the risk of irritation or injury to the rectal mucous membranes.
14. Reassure the patient. Separate the buttocks until the anal sphincter is clearly visible.	If not placed directly into the anal opening, the thermometer probe may injure adjacent tissue or cause discomfort.
15. Insert the thermometer probe into the anus about 1 inch in a child.	Depth of insertion must be adjusted based on the patient's age. Rectal temperatures are not normally taken in an infant, but may be indicated. Refer to the Special Considerations section at the end of the skill.
16. Hold the probe in place until you hear a beep, then carefully remove the probe. Note the temperature reading on the display.	If left unsupported, movement of the probe in the rectum could cause injury and/or discomfort. The signal indicates the measurement is completed. The electronic thermometer provides a digital display of the measured temperature.
17. Dispose of the probe cover by holding the probe over an appropriate waste receptacle and pressing the release button.	Proper probe cover disposal reduces risk of microorganism transmission.
18. Using toilet tissue, wipe the anus of any feces or excess lubricant. Dispose of the toilet tissue. Remove gloves and discard them.	Wiping promotes cleanliness. Disposing of the toilet tissue avoids transmission of microorganisms.
19. Cover the patient and help him or her to a position of comfort.	Ensures patient comfort.
20. Place the bed in the lowest position; elevate rails as needed.	These actions provide for the patient's safety.
21. Return the thermometer to the charging unit.	The thermometer needs to be recharged for future use.

Assessing Axillary Temperature

10. Move the patient's clothing to expose only the axilla.	The axilla must be exposed for placement of the thermometer. Exposing only the axilla keeps the patient warm and maintains his or her dignity.

11. Remove the probe from the recording unit of the electronic thermometer. Place a disposable probe cover on by sliding it on and snapping it securely.	Using a cover prevents contamination of the thermometer probe.
12. Place the end of the probe in the center of the axilla. Have the patient bring the arm down and close to the body.	The deepest area of the axilla provides the most accurate measurement; surrounding the bulb with skin surface provides a more reliable measurement.
13. Hold the probe in place until you hear a beep, and then carefully remove the probe. Note the temperature reading.	Axillary thermometers must be held in place to obtain an accurate temperature.
14. Cover the patient and help him or her to a position of comfort.	Ensures patient comfort.
15. Dispose of the probe cover by holding the probe over an appropriate waste receptacle and pushing the release button.	Discarding the probe cover ensures that it will not be reused accidentally on another patient.
16. Place the bed in the lowest position and elevate rails, as needed. Leave the patient clean and comfortable.	Low bed position and elevated side rails provide for patient safety.
17. Return the electronic thermometer to the charging unit.	Thermometer needs to be recharged for future use.

Assessing Temporal Artery Temperature

10. Brush the patient's hair aside if it is covering the temporal artery area.	Anything covering the area, such as a hat, hair, wigs, or bandages, would insulate the area, resulting in falsely high readings. Measure only the side of the head exposed to the environment.
11. Apply a probe cover.	Using a cover prevents contamination of the thermometer probe.
12. Hold the thermometer like a remote control device, with your thumb on the red 'ON' button. Place the probe flush on the center of the forehead, with the body of the instrument sideways (not straight up and down), so it is not in the patient's face.	Allows for easy use of the device and reading of the display. Holding the instrument straight up and down could be intimidating for the patient, particularly young patients and/or those with alterations in mental status.

13. Depress the ON button. Keep the button depressed throughout the measurement.

14. Slowly slide the probe straight across the forehead, midline, to the hair line. The thermometer will click; fast clicking indicates a rise to a higher temperature, slow clicking indicates the instrument is still scanning, but not finding any higher temperature.

Midline on the forehead, the temporal artery is less than 2 mm below the skin; whereas at the side of the face, the temporal artery is much deeper. Measuring there would result in falsely low readings.

15. Brush hair aside if it is covering the ear, exposing the area of the neck under the ear lobe. Lift the probe from the forehead and touch on the neck just behind the ear lobe, in the depression just below the mastoid.

Sweat causes evaporative cooling of the skin on the forehead, possibly leading to a falsely low reading. During diaphoresis, the area on the head behind the ear lobe exhibits high blood flow necessary for the arterial measurement; it is a double check for the thermometer (Exergen, 2007).

16. Release the button and read the thermometer measurement.

17. Hold the thermometer over a waste receptacle. Gently push the probe cover with your thumb against the proximal edge to dispose of probe cover.

Discarding the probe cover ensures that it will not be reused accidentally on another patient.

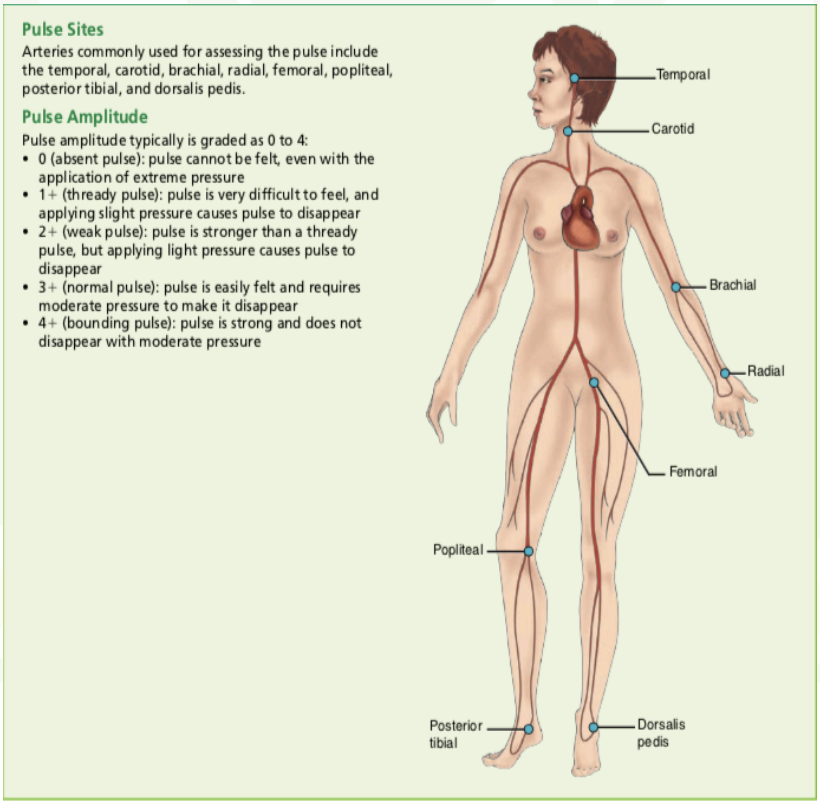
18. Instrument will automatically turn off in 30 seconds, or press and release the power button.

Turns thermometer off.

Assessing Peripheral Pulse by Palpation

The pulse is a throbbing sensation that can be palpated over a peripheral artery, such as the radial artery or the carotid artery. Auscultate (listen to) an apical pulse over the apex of the heart, as the heart beats. Peripheral pulses result from a wave of blood being pumped into the arterial circulation by the contraction of the left ventricle. Each time the left ventricle contracts to eject blood into an already full aorta, the arterial walls in the cardiovascular system expand to compensate for the increase in pressure of the blood. Characteristics of the pulse, including rate, quality, or amplitude, and rhythm provide information about the effectiveness of the heart as a pump and the adequacy of peripheral blood flow.

Pulse rates are measured in beats per minute. Pulse quality (amplitude) describes the quality of the pulse in terms of its fullness—strong or weak. It is assessed by the feel of the blood flow through the vessel. Pulse rhythm is the pattern of the pulsations and the pauses between them. Pulse rhythm is normally regular; the pulsations and the pauses between occur at regular intervals. An irregular pulse rhythm occurs when the pulsations and pauses between beats occur at unequal intervals.



Equipment

- Watch with second hand or digital readout
- Pencil or pen, paper or flow sheet, computerized record
- Nonsterile gloves, if appropriate; additional PPE, as indicated

Action	Rationale
1. Check medical order or nursing care plan for frequency of pulse assessment. More frequent pulse measurement may be appropriate based on nursing judgment.	Assessment and measurement of vital signs at appropriate intervals provide important data about the patient's health status.
2. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4. Close curtains around bed and close the door to the room, if possible. Discuss the procedure with patient and assess the patient's ability to assist with the procedure.	This ensures the patient's privacy. Explanation relieves anxiety and facilitates cooperation.
5. Put on gloves, as appropriate.	Gloves are not usually worn to obtain a pulse measurement unless contact with blood or body fluids is anticipated. Gloves prevent contact with blood and body fluids.
6. Select the appropriate peripheral site based on assessment data.	Ensures safety and accuracy of measurement.
7. Move the patient's clothing to expose only the site chosen.	The site must be exposed for pulse assessment. Exposing only the site keeps the patient warm and maintains his or her dignity.
8. Place your first, second, and third fingers over the artery. **Lightly compress the artery so pulsations can be felt and counted.**	The sensitive fingertips can feel the pulsation of the artery.

9. Using a watch with a second hand, count the number of pulsations felt for 30 seconds. Multiply this number by 2 to calculate the rate for 1 minute. **If the rate, rhythm, or amplitude of the pulse is abnormal in any way, palpate and count the pulse for 1 minute.**	Ensures accuracy of measurement and assessment.
10. Note the rhythm and amplitude of the pulse.	Provides additional assessment data regarding the patient's cardiovascular status.
11. When measurement is completed, remove gloves, if worn. Cover the patient and help him or her to a position of comfort.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Ensures patient comfort.
12. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.

Assessing Peripheral Pulse by Auscultation

An apical pulse is auscultated (listened to) over the apex of the heart, as the heart beats. The cardiovascular system is composed of the heart and the blood vessels. The heart is a cone-shaped, muscular pump, divided into four hollow chambers. The upper chambers, the atria (singular, atrium), receive blood from the veins (the superior and inferior vena cava and the left and right pulmonary veins). The lower chambers, the ventricles, force blood out of the heart through the arteries (the left and right pulmonary arteries and the aorta). One-way valves that direct blood flow through the heart are located at the entrance (tricuspid and mitral valves) and exit (pulmonic and aortic valves) of each ventricle. Heart sounds, which are produced by closure of the valves of the heart, are characterized as "lub-dub." The apical pulse is the result of closure of the mitral and tricuspid valves ("lub") and the aortic and pulmonic valves ("dub"). The combination of the two sounds is counted as one beat. Pulse rates are measured in beats per minute. Pulse rhythm is also assessed. Pulse rhythm is the pattern of the beats and the pauses between them. Pulse rhythm is normally regular; the beats and the pauses between occur at regular intervals. An irregular pulse rhythm occurs when the beats and pauses between beats occur at unequal intervals.

Equipment

- Watch with second hand or digital readout
- Stethoscope
- Alcohol swab
- Pencil or pen, paper or flow sheet, computerized record
- Nonsterile gloves, if appropriate; additional PPE, as indicated

Action	Rationale
1. Check medical order or nursing care plan for frequency of pulse assessment. More frequent pulse measurement may be appropriate based on nursing judgment. Identify the need to obtain an apical pulse measurement.	Provides for patient safety and appropriate care.
2. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4. Close curtains around bed and close the door to the room, if possible. Discuss procedure with patient and assess patient's ability to assist with the procedure.	This ensures the patient's privacy. Explanation relieves anxiety and facilitates cooperation.

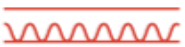
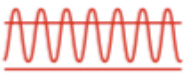
5. Put on gloves, as appropriate.	Gloves are not usually worn to obtain a pulse measurement unless contact with blood or body fluids is anticipated. Gloves prevent contact with blood and body fluids.
6. Use alcohol swab to clean the diaphragm of the stethoscope. Use another swab to clean the earpieces, if necessary.	Cleaning with alcohol deters transmission of microorganisms.
7. Assist patient to a sitting or reclining position and expose chest area.	This position facilitates identification of the site for stethoscope placement.
8. Move the patient's clothing to expose only the apical site.	The site must be exposed for pulse assessment. Exposing only the apical site keeps the patient warm and maintains his or her dignity.
9. Hold the stethoscope diaphragm against the palm of your hand for a few seconds.	Warming the diaphragm promotes patient comfort.
10. Palpate the space between the fifth and sixth ribs (fifth intercostal space), and move to the left midclavicular line. Place the diaphragm over the apex of the heart.	Position the stethoscope over the apex of the heart, where the heartbeat is best heard.
11. Listen for heart sounds ("lub-dub"). Each "lub-dub" counts as one beat.	These sounds occur as the heart valves close.
12. Using a watch with a second hand, count the heartbeat for 1 minute.	Counting for a full minute increases the accuracy of assessment.
13. When measurement is completed, remove gloves, if worn. Cover the patient and help him or her to a position of comfort.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Ensures patient comfort.
14. Clean the diaphragm of the stethoscope with an alcohol swab.	Cleaning with alcohol deters transmission of microorganisms.
15. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.

Assessing Respiration

Under normal conditions, infants and children breathe more rapidly. The depth of respirations varies normally from shallow to deep. The rhythm of respirations is normally regular, with each inhalation/exhalation and the pauses between occurring at regular intervals. An irregular respiratory rhythm occurs when the inhalation/exhalation cycle and the pauses between occur at unequal intervals. The table below outlines various respiratory patterns.

Assess respiratory rate, depth, and rhythm by inspection (observing and listening) or by listening with the stethoscope. Determine the rate by counting the number of breaths per minute. If respirations are very shallow and difficult to detect, observe the sternal notch, where respiration is more apparent. With an infant or young child, assess respirations before taking the temperature so that the child is not crying, which would alter the respiratory status.

TABLE • 1-1 PATTERNS OF RESPIRATION

	Description	Pattern	Associated Features
Normal	12–20 breaths/min Regular		Normal pattern
Tachypnea	>24 breaths/min Shallow		Fever, anxiety, exercise, respiratory disorders
Bradypnea	<10 breaths/min Regular		Depression of the respiratory center by medications, brain damage
Hyperventilation	Increased rate and depth		Extreme exercise, fear, diabetic ketoacidosis (Kussmaul's respirations), overdose of aspirin
Hypoventilation	Decreased rate and depth Irregular		Overdose of narcotics or anesthetics
Cheyne-Stokes respirations	Alternating periods of deep, rapid breathing followed by periods of **apnea** Regular		Drug overdose, heart failure, increased intracranial pressure, renal failure
Biot's respirations	Varying depth and rate of breathing, followed by periods of apnea Irregular		Meningitis, severe brain damage

Equipment

- Watch with second hand or digital readout
- Pencil or pen, paper or flow sheet, computerized record
- PPE, as indicated

Action	Rationale
1. While your fingers are still in place for the pulse measurement, after counting the pulse rate, observe the patient's respirations.	The patient may alter the rate of respirations if he or she is aware they are being counted.
2. Note the rise and fall of the patient's chest.	A complete cycle of an **inspiration** and an **expiration** composes one respiration.
3. Using a watch with a second hand, count the number of respirations for 30 seconds. Multiply this number by 2 to calculate the respiratory rate per minute.	Sufficient time is necessary to observe the rate, depth, and other characteristics.
4. If respirations are abnormal in any way, count the respirations for at least 1 full minute.	Increased time allows the detection of unequal timing between respirations.
5. Note the depth and rhythm of the respirations.	Provides additional assessment data regarding the patient's respiratory status.
6. When measurement is completed, remove gloves, if worn. Cover the patient and help him or her to a position of comfort.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Ensures patient comfort.
7. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene deters the spread of microorganisms.

Assessing Brachial Artery Blood Pressure

Blood pressure refers to the force of the blood against arterial walls. **Systolic pressure** is the highest point of pressure on arterial walls when the ventricles contract and push blood through the arteries at the beginning of systole. When the heart rests between beats during diastole, the pressure drops. The lowest pressure present on arterial walls during diastole is the **diastolic pressure** (Taylor et al., 2011). Blood pressure is measured in millimeters of mercury (mm Hg) and is recorded as a fraction. The numerator is the systolic pressure; the denominator is the diastolic pressure. The difference between the two is called the **pulse pressure.** For example, if the blood pressure is 120/80 mm Hg, 120 is the systolic pressure and 80 is the diastolic pressure. The pulse pressure, in this case, is 40.

To get an accurate assessment of blood pressure, you should know what equipment to use, which site to choose, and how to identify the sounds you hear. Take routine measurements after the patient has rested for a minimum of 5 minutes.

The series of sounds for which to listen when assessing blood pressure are called **Korotkoff sounds.** Blood pressure can be assessed with different types of devices. Commonly, it is assessed by using a stethoscope and sphygmomanometer. Blood pressure can also be estimated with a Doppler ultrasound device, by palpation, and with electronic or automated devices. It is very important to use the correct technique and properly functioning equipment when assessing blood pressure to avoid errors in measurement. Use of a cuff of the correct size for the patient, correct limb placement, recommended deflation rate, and correct interpretation of the sounds heard are also necessary to ensure accurate blood pressure measurement (Smeltzer et al., 2010; Pickering, 2005; Pickering, et al., 2004).

TABLE • 1-3 KOROTKOFF SOUNDS

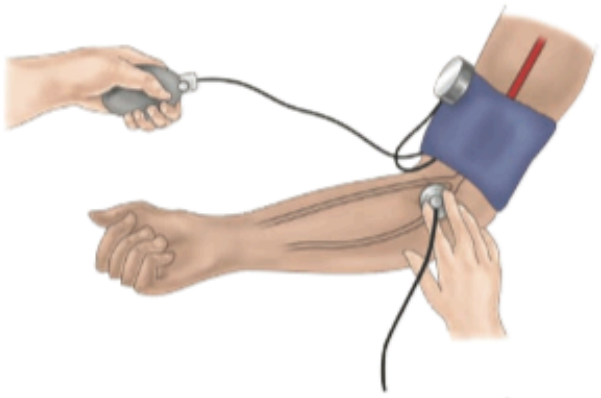
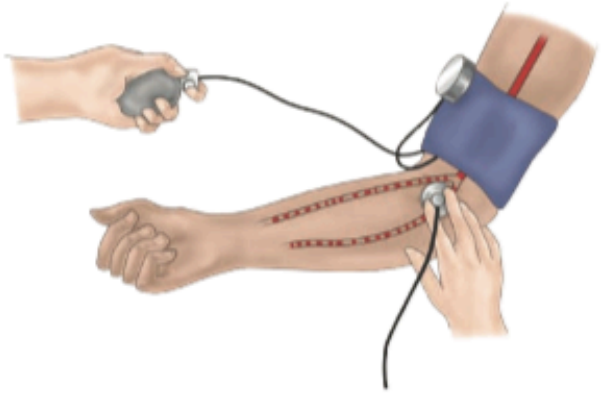
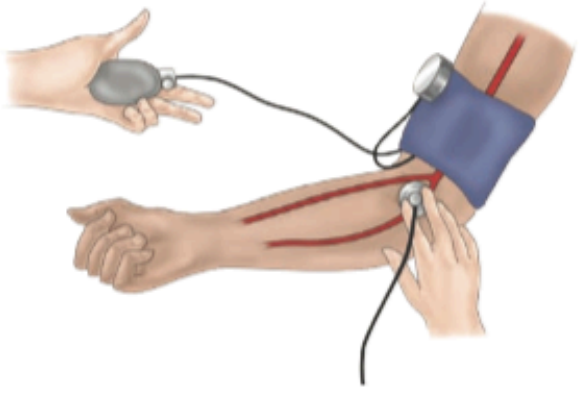
Phase	Description	Illustration
Phase I	Characterized by the first appearance of faint but clear tapping sounds that gradually increase in intensity; the first tapping sound is the systolic pressure	
Phase II	Characterized by muffled or swishing sounds; these sounds may temporarily disappear, especially in hypertensive people; the disappearance of the sound during the latter part of phase I and during phase II is called the *auscultatory gap* and may cover a range of as much as 40 mm Hg; failing to recognize this gap may cause serious errors of underestimating systolic pressure or overestimating diastolic pressure	
Phase III	Characterized by distinct, loud sounds as the blood flows relatively freely through an increasingly open artery	
Phase IV	Characterized by a distinct, abrupt, muffling sound with a soft, blowing quality; in adults, the onset of this phase is considered to be the first diastolic pressure	
Phase V	The last sound heard before a period of continuous silence; the pressure at which the last sound is heard is the second diastolic pressure	

TABLE • 1-4 BLOOD PRESSURE ASSESSMENT ERRORS AND CONTRIBUTING CAUSES

Error	Contributing Causes	Error	Contributing Causes
Falsely low assessments	• Hearing deficit • Noise in the environment • Viewing the meniscus from above eye level • Applying too wide a cuff • Inserting ear tips of stethoscope incorrectly • Using cracked or kinked tubing • Releasing the valve rapidly • Misplacing the bell beyond the direct area of the artery • Failing to pump the cuff 20 to 30 mm Hg above the disappearance of the pulse	Falsely high assessments	• Using a manometer not calibrated at the zero mark • Assessing the blood pressure immediately after exercise • Viewing the meniscus from below eye level • Applying a cuff that is too narrow • Releasing the valve too slowly • Reinflating the bladder during auscultation

TABLE • 1-5 RECOMMENDED BLOOD PRESSURE CUFF SIZES

Cuff Size	Cuff Measurements	Arm Circumference*
Newborn–premature infants	4 × 8 cm	
Infants	6 × 12 cm	
Older children	9 × 18 cm	

Equipment

- Stethoscope
- Sphygmomanometer
- Blood pressure cuff of appropriate size
- Pencil or pen, paper or flow sheet
- Alcohol swab
- PPE, as indicated

Action	Rationale
1. Check physician's order or nursing care plan for frequency of blood pressure measurement. More frequent measurement may be appropriate based on nursing judgment.	Provides for patient safety.
2. Perform hand hygiene and put on PPE, if	Hand hygiene and PPE prevent the spread of

indicated.	microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4. Close curtains around bed and close the door to the room, if possible. Discuss procedure with patient and assess patient's ability to assist with the procedure. Validate that the patient has relaxed for several minutes.	This ensures the patient's privacy. Explanation relieves anxiety and facilitates cooperation. Activity immediately before measurement can result in inaccurate results.
5. Put on gloves, if appropriate or indicated.	Gloves prevent contact with blood and body fluids. Gloves are usually not required for measurement of blood pressure, unless contact with blood or body fluids is anticipated.
6. Select the appropriate arm for application of the cuff.	Measurement of blood pressure may temporarily impede circulation to the extremity.
7. Have the patient assume a comfortable lying or sitting position with the forearm supported at the level of the heart and the palm of the hand upward. If the measurement is taken in the supine position, support the arm with a pillow. In the sitting position, support the arm yourself or by using the bedside table. If the patient is sitting, have the patient sit back in the chair so that the chair supports his or her back. In addition, make sure the patient keeps the legs uncrossed.	The position of the arm can have a major influence when the blood pressure is measured; if the upper arm is below the level of the right atrium, the readings will be too high. If the arm is above the level of the heart, the readings will be too low (Pickering, et al., 2004). If the back is not supported, the diastolic pressure may be elevated falsely; if the legs are crossed, the systolic pressure may be elevated falsely (Pickering, et al., 2004). This position places the brachial artery on the inner aspect of the elbow so that the **bell** or diaphragm of the stethoscope can rest on it easily. This sitting position ensures accuracy.
8. Expose the brachial artery by removing garments, or move a sleeve, if it is not too tight, above the area where the cuff will be placed.	Clothing over the artery interferes with the ability to hear sounds and can cause inaccurate blood pressure readings. A tight sleeve would cause congestion of blood and possibly inaccurate readings.
9. Palpate the location of the brachial artery. **Center the bladder of the cuff over the brachial artery, about midway on the arm, so that the lower edge of the cuff is about 2.5 to 5 cm (1 to 2 inches) above the inner aspect of the elbow. Line the artery marking on the cuff up with the**	Pressure in the cuff applied directly to the artery provides the most accurate readings. If the cuff gets in the way of the stethoscope, readings are likely to be inaccurate. A cuff placed upside down with the tubing toward the patient's head may give a false reading.

patient's brachial artery. The tubing should extend from the edge of the cuff nearer the patient's elbow.

10. Wrap the cuff around the arm smoothly and snugly, and fasten it. Do not allow any clothing to interfere with the proper placement of the cuff.	A smooth cuff and snug wrapping produce equal pressure and help promote an accurate measurement. A cuff wrapped too loosely results in an inaccurate reading.
11. Check that the needle on the aneroid gauge is within the zero mark. If using a mercury manometer, check to see that the manometer is in the vertical position and that the mercury is within the zero level with the gauge at eye level.	If the needle is not in the zero area, the blood pressure may not be accurate. Tilting a mercury manometer, inaccurate calibration, or improper height for reading the gauge can lead to errors in determining the pressure measurements.

Estimating Systolic Pressure

12. Palpate the pulse at the brachial or radial artery by pressing gently with the fingertips.	Palpation allows for measurement of the approximate systolic reading.
13. Tighten the screw valve on the air pump.	The bladder within the cuff will not inflate with the valve open.
14. Inflate the cuff while continuing to palpate the artery. Note the point on the gauge where the pulse disappears.	The point where the pulse disappears provides an estimate of the systolic pressure. To identify the first Korotkoff sound accurately, the cuff must be inflated to a pressure above the point at which the pulse can no longer be felt.
15. Deflate the cuff and wait 1 minute.	Allowing a brief pause before continuing permits the blood to refill and circulate through the arm.

Obtaining Blood Pressure Measurement

16. Assume a position that is no more than 3 feet away from the gauge.	A distance of more than about 3 feet can interfere with accurate readings of the numbers on the gauge.
17. Place the stethoscope earpieces in your ears. Direct the earpieces forward into the canal and not against the ear itself.	Proper placement blocks extraneous noise and allows sound to travel more clearly.
18. Place the bell or diaphragm of the stethoscope firmly but with as little pressure as possible over the brachial artery. Do not allow the stethoscope to	Having the bell or diaphragm directly over the artery allows more accurate readings. Heavy pressure on the brachial artery distorts the shape of the artery and the sound. Placing the bell or diaphragm away from

touch clothing or the cuff.	clothing and the cuff prevents noise, which would distract from the sounds made by blood flowing through the artery.
19. Pump the pressure 30 mm Hg above the point at which the systolic pressure was palpated and estimated. Open the valve on the manometer and allow air to escape slowly (allowing the gauge to drop 2 to 3 mm per second).	Increasing the pressure above the point where the pulse disappeared ensures a period before hearing the first sound that corresponds with the systolic pressure. It prevents misinterpreting phase II sounds as phase I sounds.
20. Note the point on the gauge at which the first faint, but clear, sound appears that slowly increases in intensity. Note this number as the systolic pressure. Read the pressure to the closest 2 mm Hg.	Systolic pressure is the point at which the blood in the artery is first able to force its way through the vessel at a similar pressure exerted by the air bladder in the cuff. The first sound is phase I of Korotkoff sounds.
21. Do not reinflate the cuff once the air is being released to recheck the systolic pressure reading.	Reinflating the cuff while obtaining the blood pressure is uncomfortable for the patient and can cause an inaccurate reading. Reinflating the cuff causes congestion of blood in the lower arm, which lessens the loudness of Korotkoff sounds.
22. Note the point at which the sound completely disappears.	The point at which the sound disappears corresponds to the beginning of phase V Korotkoff sounds and is generally considered the diastolic pressure reading (Pickering, et al., 2004).
23. Allow the remaining air to escape quickly. Repeat any suspicious reading, but wait at least 1 minute. Deflate the cuff completely between attempts to check the blood pressure.	False readings are likely to occur if there is congestion of blood in the limb while obtaining repeated readings.
24. When measurement is completed, remove the cuff. Remove gloves, if worn. Cover the patient and help him or her to a position of comfort.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Ensures patient comfort.
25. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene deters the spread of microorganisms.
26. Clean the diaphragm of the stethoscope with the alcohol wipe. Clean and store the sphygmomanometer, according to facility policy.	Appropriate cleaning deters the spread of microorganisms. Equipment should be left ready for use.

Skill Variation Assessing Blood Pressure Using a Doppler Ultrasound Device

Blood pressure can be measured with an ultrasound or Doppler device, which amplifies sound. It is especially useful if the sounds are indistinct or inaudible with a regular stethoscope. This method only provides an estimate of systolic blood pressure.

1. Check physician's order or nursing care plan for frequency of blood pressure measurement. More frequent measurement may be appropriate based on nursing judgment.

2. Perform hand hygiene and put on PPE, if indicated.

3. Identify the patient.
4. Explain the procedure to the patient.
5. Close curtains around bed and close the door to the room, if possible.
6. Select the appropriate limb for application of cuff.
7. Have the patient assume a comfortable lying or sitting position with the appropriate limb exposed.
8. **Center the bladder of the cuff over the artery, lining the artery marker on the cuff up with the artery.**
9. Wrap the cuff around the limb smoothly and snugly, and fasten it. Do not allow any clothing to interfere with the proper placement of the cuff.
10. Check that the needle on the aneroid gauge is within the zero mark. If using a mercury manometer, check to see that the manometer is in the vertical position and that the mercury is within the zero level with the gauge at eye level.
11. Place a small amount of conducting gel over the artery.
12. Hold the Doppler device in your nondominant hand. Using your dominant hand, place the Doppler tip in the gel. Adjust the volume as needed. Move the Doppler tip around until you hear the pulse.
13. Once the pulse is found using the Doppler device, close the valve to the sphygmomanometer. Tighten the screw valve on the air pump.
14. **Inflate the cuff while continuing to use the Doppler device on the artery. Note the point on the gauge where the pulse disappears (Figure B).**

FIGURE B. Inflating cuff while listening to artery pulsations. *(Photo by B. Proud.)*

15. Open the valve on the manometer and allow air to escape quickly. Repeat any suspicious reading, but wait at least 1 minute between readings to allow normal circulation to return in the limb. Deflate the cuff completely between attempts to check the blood pressure.
16. Remove the Doppler tip and turn off the Doppler device. Wipe excess gel off of the patient's skin with tissue. Remove the cuff.
17. Wipe any gel remaining on the Doppler probe off with a tissue. Clean the Doppler device according to facility policy or manufacturer's recommendations.
18. Return the Doppler device to the charge base.

19. Remove PPE, if used. Perform hand hygiene.
20. Record the findings on paper, flow sheet, or computerized record. Report abnormal findings to the appropriate person. Identify arm used and site of assessment if other than brachial.

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4. Growth Parameter Assessment

Using the Growth Record

The child's age, sex, and measurements of weight and length or height will be used to calculate the following growth indicators, which will be described in the next procedures:

- length/height-for-age
- weight-for-age
- weight-for-length/height
- BMI (body mass index)-for-age

The measurements described in this manual should be taken and recorded whenever an infant or child visits a health care provider, for example, for an immunization, a well-baby visit, or care during an illness. There is no WHO-recommended schedule of visits specifically for growth assessment, but some countries may recommend a schedule, such as 6 visits in the first 2 years of life.

A *Growth Record* is a booklet that contains all of the charts needed to record and assess the growth of a child from birth up to 5 years of age. A different *Growth Record* is needed for boys and girls because boys and girls have different weights and lengths beginning at birth. Boys and girls need to be assessed by standards that reflect normal differences in their sizes.

A *Growth Record* should be started for each child and kept by the mother. When a child visits the health facility, ask the mother if the child has a *Growth Record*.

If a child's *Growth Record* has been left at home, record information on whatever back-up register or record is available at the health facility, and update the child's *Growth Record* at the next visit. If a child's *Growth Record* is lost or destroyed, replace it if supplies permit.

Praise the mother for having her child's growth assessed regularly.

Start a new growth record

Depending on the sex of the child, select a *Boy's Growth Record* or *Girl's Growth Record*. Show the *Growth Record* to the mother and explain the following points:

- This booklet will be your record of your child's growth and health.
- Each time you visit, your child will be weighed and measured, and the measurements will be recorded in this booklet.
- The booklet includes charts on which we will plot your child's measurements in order to assess his or her growth.
- It has a schedule of immunizations to show when your child needs and receives immunizations.

- It has recommendations about feeding your child and important points about caring for your child at different ages.
- Keep this booklet in a safe place and bring it with you whenever you bring your child to a health facility.

Complete page 1 of the *Growth Record* (Personal Data, opposite) by asking questions of the mother and reviewing any relevant documents that the mother may have, such as a health card or birth certificate.

Personal Data

Child's name _____

Identification/Record number _____ ❑Boy

If a girl, must use a Girl's Growth Record

Parents' names _____

_____

Address _____

_____

Birth information:

Date of birth _____

Gestational age at birth _____ Single/multiple birth? _____

Measurements at birth:

Weight _____ Length _____ Head circumference _____

Birth rank _____

Date of birth of next younger sibling (born to mother)_____

Feeding:

Age at introduction of any foods or fluids _____

Age at termination of breastfeeding _____

More details of feeding history may be recorded in Visit Notes

Adverse events (dates):

(such as death of parent, death of sibling age <5 years)_____

_____

The date of birth (day/month/year) is especially important. If the date is not documented, ask the mother. If she does not know the date, ask her questions to determine the date as closely as possible; for example, ask when the birth occurred in relation to a local event or holiday.

The gestational age at birth (i.e. the number of weeks of pregnancy) may be recorded in the child's birth record. If not, ask the mother and record whether the baby was **term** (37–41 completed weeks of pregnancy), **pre-term** (before 37 weeks), or **post-term** (42 weeks or more).

Ask and record whether this child was a single or multiple birth. Record other data related to the child's birth if documented, for example, weight, length, and head circumference at birth.

Ask the mother about the child's birth rank (i.e. order). For example, ask: Is this your first child, second child, etc.? Include all live births in order, even if an older sibling has died. For example, if the child is the second-born, but the older sibling has died, you would still record the birth rank as 2nd.

If the mother has had other children after this child, ask when her next younger child was born.

Depending on the child's age, ask appropriate questions to determine whether the child is still breastfeeding – either exclusively or with other foods and fluids. If other foods or fluids have been introduced, ask and record the age at which they were introduced. If the child is no longer breastfeeding, ask and record the age at termination of breastfeeding.

Ask about any adverse events that may affect the child's health. For example, ask "Are there any events that have happened, such as a death of a family member or caregiver, that could affect the child's physical or emotional health?" Also ask when these events occurred.

Record reason for visit and child's age today

Ask the mother about the reason for the child's visit and record the reason in the Visit Notes (for example, immunization, check-up, or illness). If the child is ill, take care of the immediate concerns before continuing the growth assessment process.

It is important to know the precise age of the child in order to assess certain growth indicators. Determine the age of the child today by using a computerized system (if available) or a "child age calculator," a disk that is turned to calculate a child's age in completed weeks or months in the first year of life. If the child is more than a year old, you will need to mentally calculate the child's completed years and then use the disk to determine the number of additional months completed beyond the completed years. Where the exact date of birth is unknown, a local events calendar could be used to establish the child's likely date of birth.

Instructions for use of child age calculator

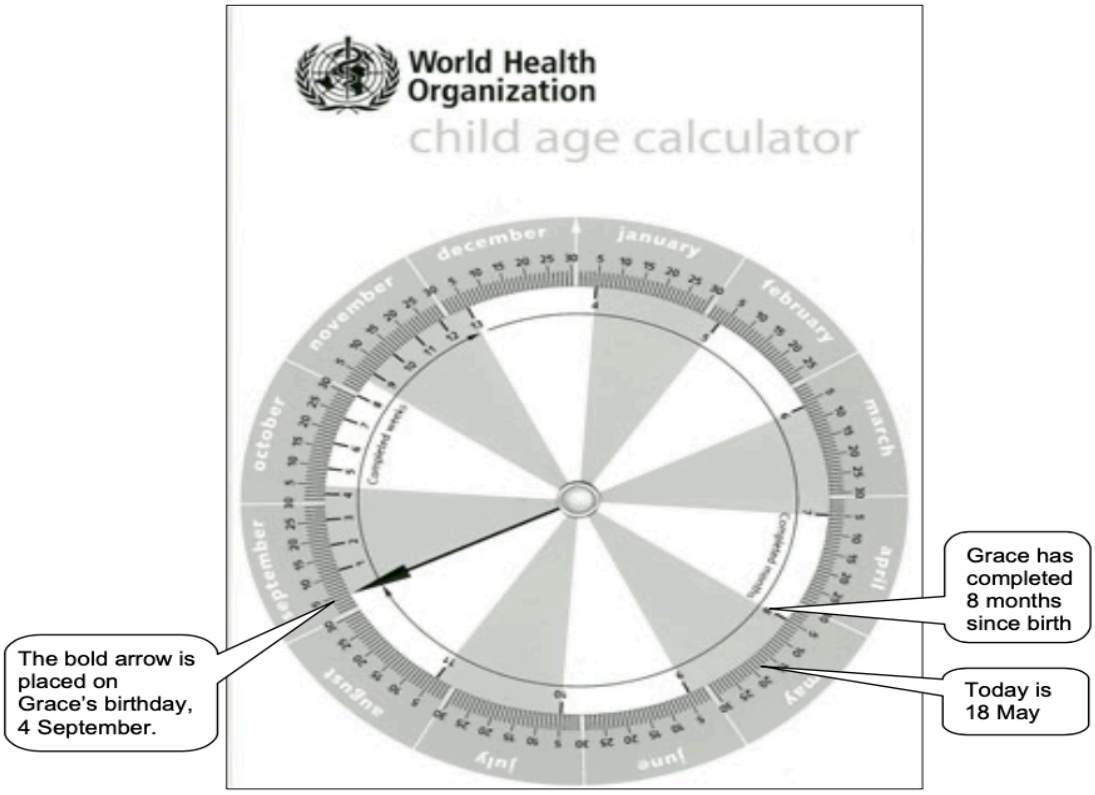
1. Determine the child's date of birth. This date should already be recorded in the *Growth Record* on page 1 (Personal Data).
2. Determine and note down the number of full years the child has completed, e.g. ask the mother how many birthdays have been celebrated if this is a local custom. (Note: Simply subtracting the year of birth from the current year will be accurate only if the child has already had a birthday this year.)
    - If the child is one or more years old, you will turn the disk to calculate the number of additional months completed.

- If the child is less than one year old, you will use the disk to count the number of weeks (in the first 3 months) or months (from 3–11 months) completed since birth.

3. Turn the disk until the bold arrow points to the child's birthday (month and day) on the stationary circular calendar.
4. Locate today's date on the stationary calendar and count on the rotating disk how many months (or weeks if less than 3 months old) the child has completed since birth or the last birthday.
5. Record the child's age today in the Visit Notes of the *Growth Record*. Use abbreviations agreed upon for year, month, and week.
    - If the child is more than 1 year old, record completed years and months, for example, "1 yr 6 mo," "2 yr 3 mo." If no months have been completed beyond the child's birthday, record as "1 yr 0 mo," "2 yr 0 mo," etc.
    - If the child is between 3 months and 1 year old, record completed months, for example, "4 mo," "11 mo."
    - If the child is less than 3 months old, record completed weeks, for example, "9 wk." Notice that 13 weeks = 3 months.
    - If the child was born on 29 February, place the bold arrow on 28 February.

Example

Grace Madu is seen at a clinic on 18 May 2020. Her mother has brought her for immunization. Grace's date of birth is already recorded on the Personal Data page of her *Girl's Growth Record* as 4 September 2020. She has not yet completed one year since birth.



To determine Grace's age in completed months, the health care provider turns the disk on the age calculator until the bold arrow points to her birthday, 4 September. He then locates the current date on the circular calendar. He notes that 8 months have been completed since Grace's birthday.

In the Visit Notes section of the *Growth Record*, on page 6, the health care provider writes Grace's age as "8 mo" and the reason for visit as "immunization."

Select pages of the Growth Record to use at this visit

You will use the Visit Notes (pages 6–11 of the *Growth Record*) at every visit to record the date, child's age, measurements, reason for visit, observations, recommendations, as well as notes on feeding history, any problems, and counselling given. In addition, you may use other pages of the *Growth Record* appropriate for the child's age, including:

- Growth charts (pages 27–40) – Select the four charts to use based on the child's age at a given visit. Refer to the table of contents at the beginning of the *Growth Record* to make the selection. Growth indicators will be plotted on the selected charts.
- Feeding recommendations (pages 13–20) – Use the recommendations for the child's current or next age group.

- Care messages (pages 21– 26) – As needed, use the messages that are appropriate at all times (page 21) as well as messages about emotional development, communication and movement for the child's current or next age group.
- Recommended national immunization schedule (page 4) – Refer to this page to determine whether a child is due for an immunization. This page will vary by country. Record dates that any immunizations are given and the date of the next scheduled immunization.
- Other national programme recommendations (page 5) – This page will vary according to national recommendations. Record any recommended supplements given, procedures done, etc.

Example

For Grace Madu, the 8-month-old girl described earlier, the health care provider will use the following four growth charts in the *Girl's Growth Record*:

- Length-for-age, Girls, 6 months to 2 years, page 33
- Weight-for-age, Girls, 6 months to 2 years, page 34
- Weight-for-length, Girls, Birth to 2 years, page 35
- BMI-for-age, Girls, 6 months to 2 years, page 36

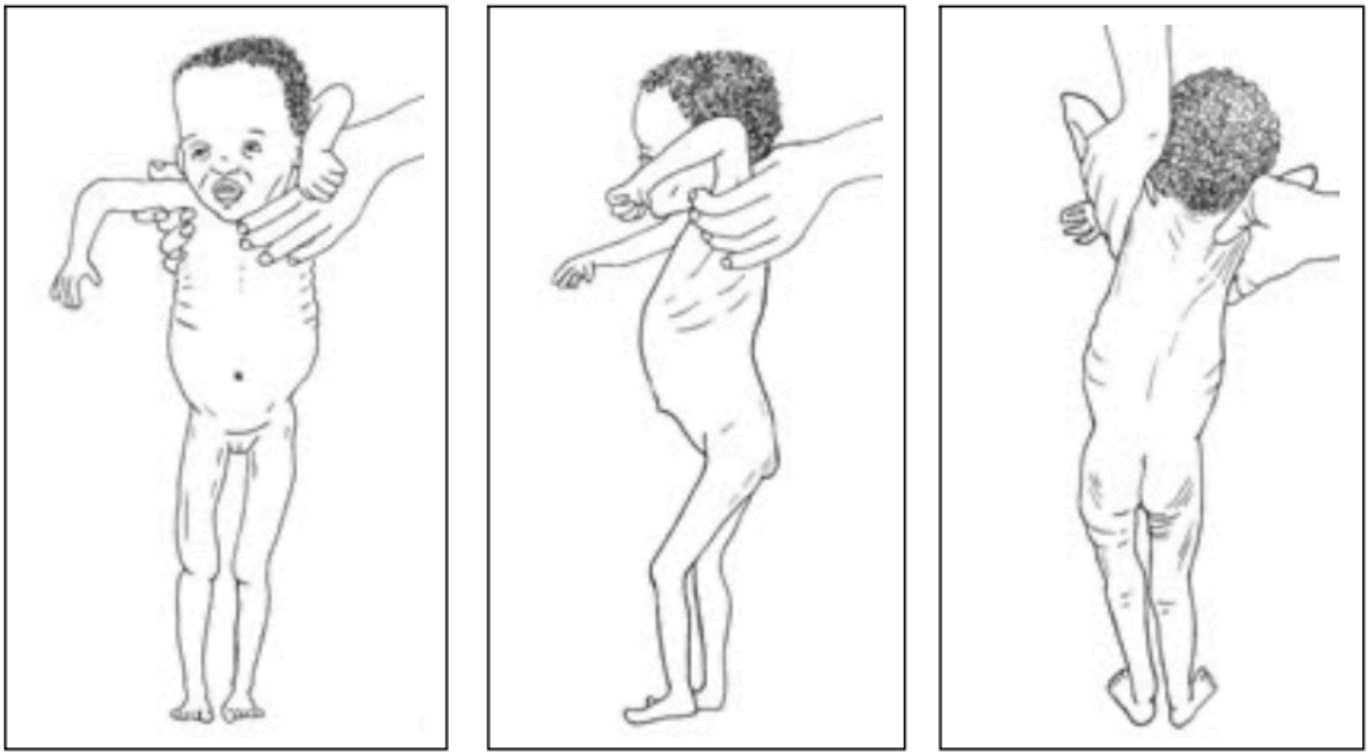
The health care provider will also provide any immunizations needed, according to the schedule on page 4.

Depending on the results of Grace's growth assessment and the time available, the health care provider may discuss with the mother feeding recommendations suitable for a child who is 8 months of age.

Observation in the Child and Noting Clinical Signs of Marasmus and Kwashiorkor

When a child is undressed to prepare for weighing, certain clinical signs of severe undernutrition may be apparent. It is important to recognize signs of **marasmus** and **kwashiorkor** since they require urgent specialized care that may include special feeding regimens, careful monitoring, antibiotics, etc. Regardless of their weight, children with these syndromes should be referred for urgent care.

- ***Marasmus*** (non-edematous malnutrition): In this form of severe undernutrition, the child is **severely wasted** and has the appearance of **"skin and bones"** due to loss of muscle and fatty tissue. The child's face looks like an old man's following loss of facial subcutaneous fat, but the eyes may be alert. The ribs are easily seen. There may be folds of skin on the buttocks and thighs that make it look as if the child is wearing "baggy pants." Weight-for- age and weight-for-length/height are likely to be very low.

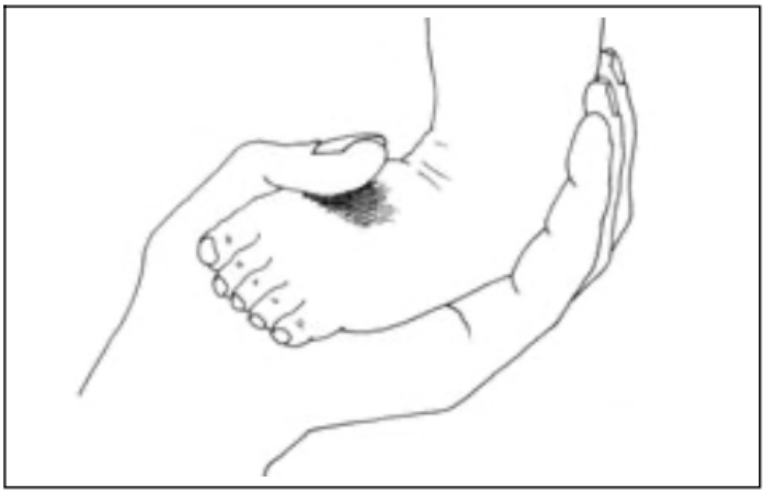


- ***Kwashiorkor*** (oedematous malnutrition): In this form of severe undernutrition, the child's muscles are wasted, but the wasting may not be apparent due to **generalized edema** (swelling from excess fluid in the tissues). The child is withdrawn, irritable, obviously ill and will not eat. The face is round (because of

edema) and the **hair is thin, sparse and sometimes discoloured**. The **skin has symmetrical discoloured patches where the skin later cracks and peels off.** A child with kwashiorkor will usually be underweight, but the oedema may mask the true weight.

- ***Marasmic kwashiorkor***: Kwashiorkor and marasmus are distinct conditions, but in communities where both occur, cases of severe undernutrition often have features of both. For example, a child may have severe wasting as seen in marasmus, along with the skin and hair changes or oedema typical in kwashiorkor. The child's upper body is wasted, but the lower limbs are swollen with edema.
- ***Edema of both feet***: Edema of both feet is a sign that a child needs referral, even if other signs of kwashiorkor are not present. The oedema must appear in both feet. (If the swelling is in only one foot, it may just be a sore or infected foot.) To check for oedema, grasp the foot so that it rests in your hand with your thumb on top of the foot. Press your thumb gently for a few seconds. The child has edema if a pit (dent) remains in the foot when you lift your thumb.

A child with edema of both feet is automatically considered severely underweight, regardless of what the scale shows. You should weigh and measure the child, but do not determine a BMI based on the weight. Note the weight, length/height, and the edema in the Visit Notes. When plotting the child's measurements, indicate on the graphs, near the relevant points, that the child has oedema. Refer the child for specialized care.



Recording other observations

Other observations about the child's appearance may also be recorded in the Visit Notes before weight and length/height are measured. The following terms may be useful in recording your observations. Keep in mind, however, that some of these terms have more technical definitions based on the child's charted weight-for-length/height and BMI-for-age.

Terms for recording observations about the child's appearance:

- Wasted* (too thin)
- Lean (fleshed out, no noticeable fat)
- Normal (rounded contours, no noticeable excess fat)
- Heavy (sturdy, mostly muscular, not lean or thin)
- Overweight* (noticeable fat)
- Obese* (excess fat)

Measuring Child's Weight

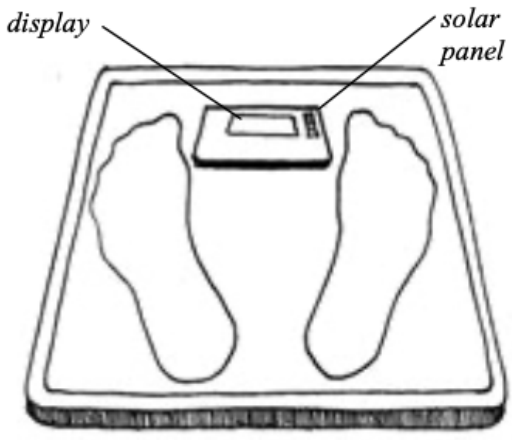
It is recommended to weigh children using a scale with the following features:

- Solidly built and durable
- Electronic (digital reading)
- Measures up to 150 kg
- Measures to a precision of 0.1 kg (100g)
- Allows tared weighing

"Tared weighing" means that the scale can be re-set to zero ("tared") with the person just weighed still on it. Thus, a mother can stand on the scale, be weighed, and the scale tared. While remaining on the scale, if she is given her child to hold, the child's weight alone appears on the scale. Tared weighing has two clear advantages:

- There is no need to subtract weights to determine the child's weight alone (reducing the risk of error).
- The child is likely to remain calm when held in the mother's arms for weighing.

There are many types of scales currently in use. The UNISCALE (made by UNICEF) has the recommended features listed above and is used in this course to demonstrate weighing techniques. It is powered by a lithium battery that is good for a million measurement sessions. The scale has a solar on-switch, so it requires adequate lighting to function. Footprints may be marked on the scale to show where a person should stand.



UNISCALE

A taring scale is easy to use and reliable. However, there are other types of scales that may be reliable, for example, an electronic baby scale, or a pediatric beam balance that has been calibrated. Children who can stand alone can

be weighed standing on a scale. Otherwise, the mother can be weighed alone; then the mother and child can be weighed together and the mother's weight subtracted to determine the child's weight.

Bathroom scales are not recommended as they tend to be unreliable. Hanging scales are also not reliable when weighing agitated babies.

Prepare for weighing

Explain to the mother the reasons for weighing the child, for example, to see how the child is growing, how the child is recovering from a previous illness, or how the child is responding to changes that have been made in his feeding or care.

If the child is less than 2 years old or is unable to stand, you will do tared weighing. Explain the tared weighing procedure to the mother as follows. Stress that the mother must stay on the scale until her child has been weighed in her arms.

- The mother will remove her shoes and step on the scale to be weighed alone first. She may need to adjust any long garments that could cover the display and solar panel of the scale.
- After the mother's weight appears on the display, tell her to remain standing on the scale. Re-set the reading to zero by covering the solar panel of the scale (thus blocking out the light).
- Then give the mother her child to hold.
- The child's weight will appear on the scale.
- Record the child's weight.

If the child is 2 years or older, you will weigh the child alone if the child will stand still. Explain that the child will need to step on the scale alone and stand very still.

Undress the child. Explain that child needs to remove outer clothing in order to obtain an accurate weight. A wet diaper, or shoes and jeans, can weigh more than 0.5 kg. Babies should be weighed naked; wrap them in a blanket to keep them warm until weighing. Older children should remove all but minimal clothing, such as their underclothes.

If it is too cold to undress a child, or if the child resists being undressed and becomes agitated, you may weigh the clothed child, but note in the *Growth Record* that the child was clothed. It is important to avoid upsetting the child so that the length/height measurements can also be taken.

If it is socially unacceptable to undress the child, remove as much of the clothing as possible.

Note: If the child has braids or hair ornaments that will interfere with length/height measurements, remove them **before weighing** to avoid delay between the measurements. Especially with young children whose length will be measured, it is important to move quickly and surely from the scale to the length board to avoid upsetting the child.

Weigh a child using tared weighing

Be sure that the scale is placed on a flat, hard, even surface. It should not be placed on a loose carpet or rug, but a firm carpet that is glued down is acceptable. Since the scale is solar powered, there must be enough light to operate the scale.

- To turn on the scale, cover the solar panel for a second. When the number 0.0 appears, the scale is ready.
- Check to see that the mother has removed her shoes. You or someone else should hold the naked baby wrapped in a blanket.
- Ask the mother to stand in the middle of the scale, feet slightly apart (on the footprints, if marked), and remain still. The mother's clothing must not cover the display or solar panel. Remind her to stay on the scale even after her weight appears, until the baby has been weighed in her arms.
- With the mother still on the scale and her weight displayed, tare the scale by covering the solar panel for a second. The scale is tared when it displays a figure of a mother and baby and the number 0.0.
- Gently hand the naked baby to the mother and ask her to remain still.
- The baby's weight will appear on the display. Record this weight in the Visit Notes of the child's *Growth Record*. Be careful to read the numbers in the correct order (as though you were viewing while standing on the scale rather than upside-down).

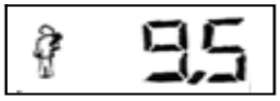
  Note: If a mother is very heavy (e.g. more than 100 kg) and the baby's weight is relatively low (e.g. less than 2.5 kg), the baby's weight may not register on the scale. In such cases, have a lighter person hold the baby on the scale.

Example

Mother's weight alone

Taring the scale

Baby's weight appears on display:



Note that the scale pictured above weighs with a precision to the nearest 0.1 kg. **Precision** describes the smallest exact unit that the scale can measure. The **accuracy** of the measurements, however, depends on whether the scale is calibrated and whether the observer reads the display correctly.

Weigh a child alone

If a child is 2 years old or older and will stand still, weigh the child alone. Ask the mother to help the child remove shoes and outer clothing. Talk with the child about the need to stand still. Communicate with the child in a sensitive, non-frightening way.

- To turn on the scale, cover the solar panel for a second. When the number 0.0 appears, the scale is ready.
- Ask the child to stand in the middle of the scale, feet slightly apart (on the footprints, if marked), and to remain still until the weight appears on the display.
- Record the child's weight to the nearest 0.1 kg.

If the child jumps on the scale or will not stand still, you will need to use the tared weighing procedure instead.

Measuring Length or Height

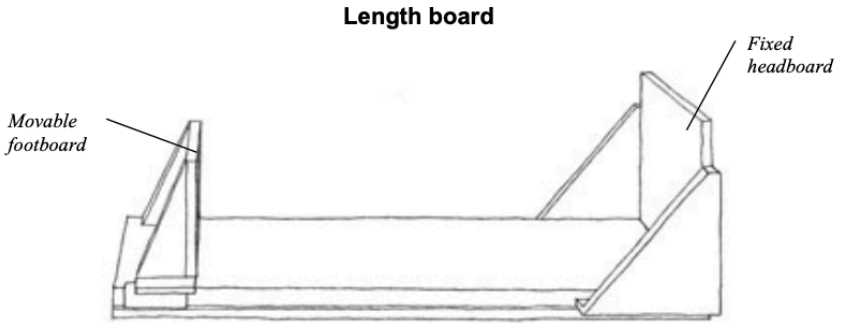
Depending on a child's age and ability to stand, measure the child's length or height. A child's length is measured lying down (recumbent). Height is measured standing upright.

- If a child is less than 2 years old, measure recumbent length.
- If the child is aged 2 years or older and able to stand, measure standing height.

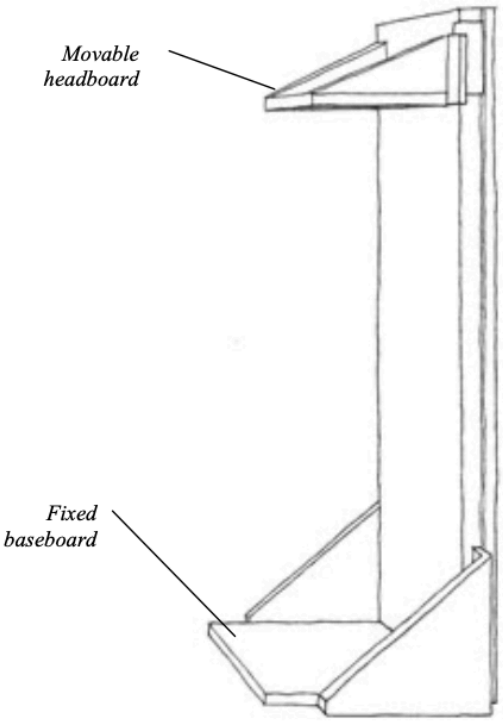
In general, standing height is about 0.7 cm less than recumbent length. This difference was taken into account in developing the WHO growth standards used to make the charts in the *Growth Record*. Therefore, it is important to adjust the measurements if length is taken instead of height, and vice versa.

- If a child less than 2 years old will not lie down for measurement of length, measure standing height and **add 0.7 cm** to convert it to length.
- If a child aged 2 years or older cannot stand, measure recumbent length and **subtract 0.7 cm** to convert it to height.

Equipment needed to measure length is a length board (sometimes called an infantometer) which should be placed on a flat, stable surface such as a table. To measure height, use a height board (sometimes called a stadiometer) mounted at a right angle between a level floor and against a straight, vertical surface such as a wall or pillar.



Height board



A good length or height board should be made of smooth, moisture-resistant (varnished or polished) wood. The horizontal and vertical pieces should be firmly joined at right angles. A movable piece serves as the footboard when measuring length or the headboard when measuring height. Unless there is a digital counter, a measuring tape should be fixed firmly in a groove along the length of the board, so that moving parts do not scrape it and rub off the markings.

Prepare to measure length or height

Be prepared to measure length/height immediately after weighing, while the child's clothes are off. Check that the child's shoes, socks, and hair ornaments have been removed. Undo braids if they will interfere with the measurement of length/height.

If a baby is weighed naked, a dry diaper can be put back on to avoid getting wet while measuring length. If the room is cool and there is any delay, keep the child warm in a blanket until length/height can be measured.

Whether measuring length or height, the mother is needed to help with measurement and to soothe and comfort the child. Explain to the mother the reasons for the measurement and the steps in the procedure. Answer any questions that she may have. Show her and tell her how she can help you. Explain that it is important to keep the child still and calm to obtain a good measurement.

Measure length

Cover the length board with a thin cloth or soft paper for hygiene and for the baby's comfort.

Explain to the mother that she will need to place the baby on the length board herself and then help to hold the baby's head in place while you take the measurement. Show her where to stand when placing the baby down, i.e. opposite you, on the side of the length board away from the tape. Also show her where to place the baby's head (against the fixed headboard) so that she can move quickly and surely without distressing the baby.

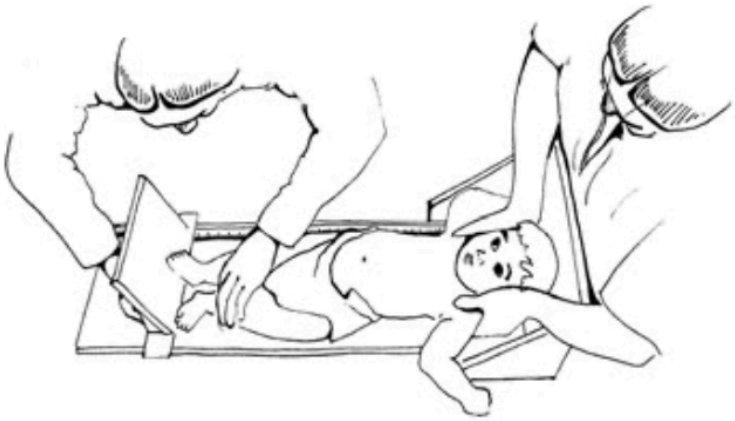
When the mother understands your instructions and is ready to assist:

- Ask her to lay the child on his back with his head against the fixed headboard, compressing the hair.
- Quickly position the head so that an imaginary vertical line from the ear canal to the lower border of the eye socket is perpendicular to the board. (The child's eyes should be looking straight up.) Ask the mother to move behind the headboard and hold the head in this position.

Speed is important. Standing on the side of the length board where you can see the measuring tape and move the footboard:

- Check that the child lies straight along the board and does not change position. Shoulders should touch the board, and the spine should not be arched. Ask the mother to inform you if the child arches the back or moves out of position.
- Hold down the child's legs with one hand and move the footboard with the other. Apply gentle pressure to the knees to straighten the legs as far as they can go without causing injury. *Note: it is not possible to straighten the knees of newborns to the same degree as older children. Their knees are fragile and could be injured easily, so apply minimum pressure*. If a child is extremely agitated and both legs cannot be held in position, measure with one leg in position.
- While holding the knees, pull the footboard against the child's feet. The soles of the feet should be flat against the footboard, toes pointing upwards. If the child bends the toes and prevents the footboard from touching the soles, scratch the soles slightly and slide in the footboard quickly when the child straightens the toes.
- Read the measurement and record the child's length in centimetres to the last **completed** 0.1 cm in the Visit Notes of the *Growth Record*. This is the last line that you can actually see. (0.1 cm = 1 mm)

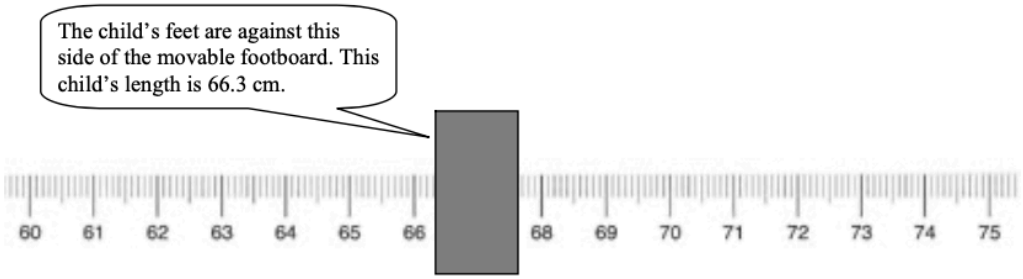
  Remember: If the child whose length you measured is 2 years old or more, subtract 0.7 cm from the length and record the result as height in the Visit Notes.



Move quickly and surely to measure length accurately before the baby becomes agitated.

Example

Following is a picture of part of a measuring tape. The numbers and longer lines indicate centimetre markings. The shorter lines indicate millimetres. The gray box shows the position of the footboard when a length measurement is taken.



Measure standing height

Ensure that the height board is on level ground. Check that shoes, socks and hair ornaments have been removed.

Working with the mother, and kneeling in order to get down to the level of the child:

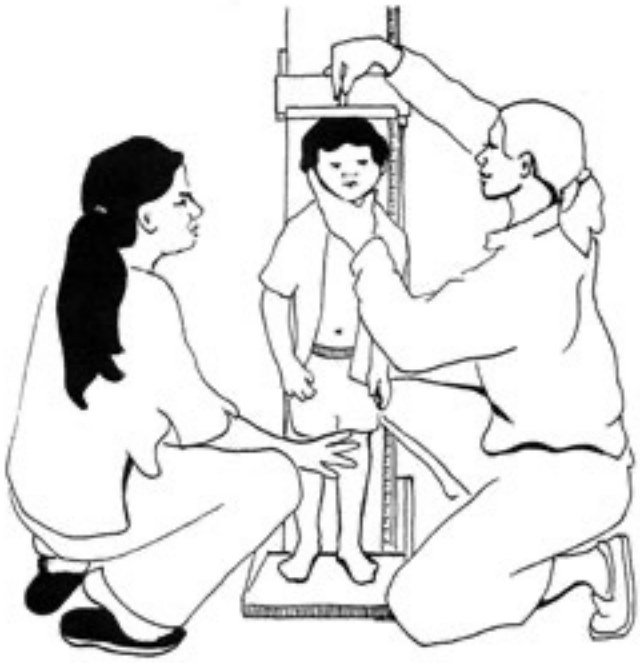
- Help the child to stand on the baseboard with feet slightly apart. The back of the head, shoulder blades, buttocks, calves, and heels should all touch the vertical board. This alignment may be impossible for an obese child, in which case, help the child to stand on the board with one or more contact points touching the board. The trunk should be balanced over the waist, i.e., not leaning back or forward.

- Ask the mother to hold the child's knees and ankles to help keep the legs straight and feet flat, with heels and calves touching the vertical board. Ask her to focus the child's attention, soothe the child as needed, and inform you if the child moves out of position.
- Position the child's head so that a horizontal line from the ear canal to the lower border of the eye socket runs parallel to the baseboard. To keep the head in this position, hold the bridge between your thumb and forefinger over the child's chin.
- If necessary, push gently on the tummy to help the child stand to full height.
- Still keeping the head in position, use your other hand to pull down the headboard to rest

  firmly on top of the head and compress the hair.

- Read the measurement and record the child's height in centimetres to the last **completed** 0.1 cm in the Visit Notes of the *Growth Record*. This is the last line that you can actually see. (0.1 cm = 1 mm)

  Remember: If the child whose height you measured is less than 2 years old, add 0.7 cm to the height and record the result as length in the Visit Notes.



Determine BMI (Body Mass Index)

BMI is a number that associates a person's weight with his or her height/length. BMI can be a useful growth indicator when it is plotted on a graph against a child's age. BMI is calculated as follows:

Weight in kg ÷ squared length/height in metres

Another way to show the formula is kg/m^2. (If the measurements are recorded in pounds and inches, convert them to metric units before calculating BMI: 1 inch = 2.54 cm or 0.0254 m, and 1 pound = 0.4536 kg.) BMI is rounded to one decimal place.

It is very important to use a **length** measurement for a child less than 2 years old and a **height** measurement for a child age 2 years or older. If necessary, convert height to length (by adding 0.7 cm) or length to height (bys subtracting 0.7 cm) before determining the child's BMI.

If you have a calculator with an x^2 button, it is relatively simple to calculate a child's BMI as follows:

1) Type in the weight in kg (to the nearest 0.1 kg).

2) Press the / or ÷ sign.

3) Type in the length or height in metres. *(This will require expressing centimetres as metres; for example, 82.3 centimetres is expressed as 0.823 metres.)*

4) Press the x^2 button. The height squared is displayed.

5) Press the = button. The BMI is displayed.

6) Round the BMI to one decimal place and record the BMI on the Visit Notes page of the *Growth Record*.

If your calculator lacks an x^2 button, follow steps 1-3, repeat steps 2 and 3, and then press the = button to display the BMI. If you have no calculator, consult a table that shows BMIs for various weights and lengths or heights.

To use the BMI table:

- Find the child's length or height (in centimetres) in the far left column of the table. If the exact measurement is not shown, select the closest one. If the child's measurement is halfway between those shown, select the next higher measurement.

- Look across the row to find the child's weight. If the exact weight is not shown, select the closest one. If the weight is halfway between those shown, consider it "on the line."
- Trace your finger upward from the weight to find the child's BMI on the top row of the table. (Or you can trace downward, as the BMIs are also on the bottom row.) If the weight was "on the line," the BMI will be halfway between those shown, e.g. 15.5 if between 15 and 16.
- Record the BMI on the Visit Notes page of the *Growth Record*.

Example

Following is an excerpt from the BMI table. This example shows how to use the BMI table for a girl named Amani, who is age 2 years and 4 months.

- Amani's height is 88.2 cm. The closest height in the far left column of the table is 88 cm (circled below).
- Amani's weight is 11.5 kg. The closest weight on the row for her height is 11.6 kg.
- Tracing a finger upward from Amani's weight, you find that her BMI (on the top row of the table) is 15.

L or H (cm)	Body Mass Index (BMI)																			L or H (cm)
	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
84	5.6	6.4	7.1	7.8	8.5	9.2	9.9	10.5	11.3	12.0	12.7	13.4	14.1	14.8	15.5	16.2	16.9	17.6	18.3	84
85	5.8	6.5	7.2	7.9	8.7	9.4	10.1	10.8	11.6	12.3	13.0	13.7	14.5	15.2	15.9	16.6	17.3	18.1	18.8	85
86	5.9	6.7	7.4	8.1	8.9	9.6	10.4	11.1	11.8	12.6	13.3	14.1	14.8	15.5	16.3	17.0	17.8	18.5	19.2	86
87	6.1	6.8	7.6	8.3	9.1	9.8	10.6	11.4	12.1	12.9	13.6	14.4	15.1	15.9	16.7	17.4	18.2	18.9	19.7	87
88	6.2	7.0	7.7	8.5	9.3	10.1	10.9	11.6	12.4	13.2	13.9	14.7	15.5	16.3	17.0	17.8	18.6	19.4	20.1	88
89	6.3	7.1	7.9	8.7	9.5	10.3	11.1	11.9	12.7	13.5	14.3	15.0	15.8	16.6	17.4	18.2	19.0	19.8	20.6	89
90	6.5	7.3	8.1	8.9	9.7	10.5	11.3	12.2	13.0	13.8	14.6	15.4	16.2	17.0	17.8	18.6	19.4	20.3	21.1	90
91	6.6	7.5	8.3	9.1	9.9	10.8	11.6	12.4	13.2	14.1	14.9	15.7	16.6	17.4	18.2	19.0	19.9	20.7	21.5	91
92	6.8	7.6	8.5	9.3	10.2	11.0	11.8	12.7	13.5	14.4	15.2	16.1	16.9	17.8	18.6	19.5	20.3	21.2	22.0	92

If you wish to use the mathematical formula (kg/m^2) and a calculator to determine Amani's BMI, it is necessary to express her height in metres. Her height of 88.2 cm is expressed as 0.882 m. Her BMI is calculated as follows:

11.5 kg ÷ 0.882 m^2 = 14.78..., which would be recorded as 14.8 in the Visit Notes

As you can see, the results of using the BMI table and the calculator are very close.

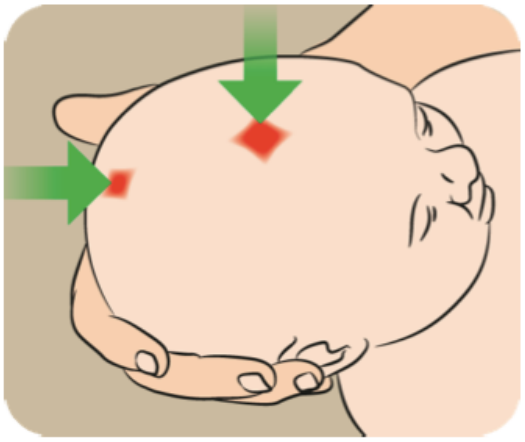
Reminder: If a child has edema of both feet, do not determine the child's BMI, as his weight is unrealistically high due to fluid retention. Refer the child with edema of both feet for specialized care.

5. Safety

Holding a Newborn/ Infant

Picking up a newborn baby

1. Take care with the newborn's head, especially around the fontanelles. Always support the newborn's head and neck.



2. To pick up baby, slide one hand under baby's head and neck and the other hand under their bottom. Bend your knees to protect your back.

3. Once you've got a good hold, scoop up the baby and bring baby close to your chest as you straighten your legs again.

Holding and cradling a baby

1. Make sure the baby's head is resting against your chest. Slide your hand up from baby's bottom to support their neck.

2. Gently move the baby's head to the crook of your arm, still supporting baby's neck. Place your other hand under baby's bottom.

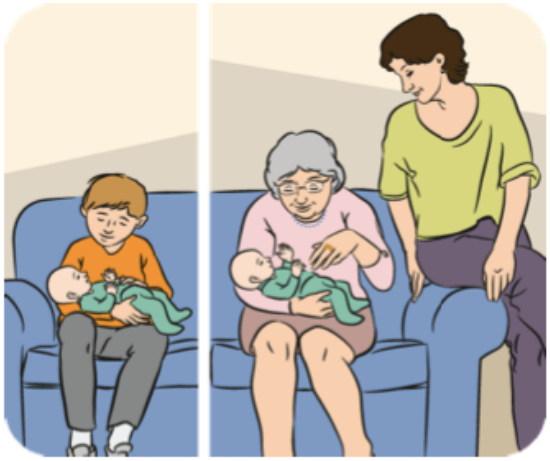
3. Using the cradle hold lets you look at the baby. You can smile and talk to baby.

Shoulder hold and safety tips

1. **Shoulder hold**: rest baby on your chest and shoulder, supporting baby's head and neck with your hand. Place your other hand under baby's bottom.

2. **Keep the baby safe**: never hold hot drinks or cook while you're holding baby. Always hold baby securely when going up or down steps.

3. Help children and older people if they want to hold the baby. Ask them to sit down, then gently place baby in their cradled arms.



Applying an Extremity Restraint

Cloth extremity restraints immobilize one or more extremities. They may be indicated after other measures have failed to prevent a patient from removing therapeutic devices, such as intravenous (IV) access devices, endotracheal tubes, oxygen, or other treatment interventions. Restraints can be applied to the hands, wrists, or ankles. **Restraints should be used only after less-restrictive methods have failed. Ensure compliance with ordering, assessment, and maintenance procedures.**

Equipment

- Appropriate cloth restraint for the extremity that is to be immobilized
- Padding, if necessary, for bony prominences
- PPE, as indicated

Action	Rationale
1. Determine need for restraints.	Restraints should be used only as a last resort when alternative measures have failed and the patient is at increased risk for harming self or others.
2. Confirm agency policy for application of restraints. **Secure an order from the primary care provider, or validate that the order has been obtained within the past 24 hours.**	Policy protects the patient and the nurse and specifies guidelines for application as well as type of restraint and duration. **The Joint Commission (TJC) standards require that a new order for restraints must be written every 24 hours.**
3. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
4. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
5. Explain reason for restraint use to patient and family. Clarify how care will be given and how needs will be met. Explain that restraint is a temporary measure.	Explanation to patient and family may lessen confusion and anger and provide reassurance. A clearly stated agency policy on application of restraints should be available for patient and family to read. In a long-term care facility, the family must give consent before a restraint is applied.
6. Include the patient's family and/or significant others in the plan of care.	This promotes continuity of care and cooperation.
7. Apply restraint according to manufacturer's directions:	Proper application prevents injury.
a. Choose the least restrictive type of device that allows the greatest possible degree of mobility.	This provides minimal restriction.

b. Pad bony prominences.	Padding helps prevent skin injury.
c. Wrap the restraint around the extremity with the soft part in contact with the skin. If a hand mitt is being used, pull over the hand with cushion to the palmar aspect of hand. Secure in place with the Velcro straps.	This prevents excess pressure on extremity.
8. Ensure that two fingers can be inserted between the restraint and patient's wrist or ankle.	Proper application ensures that there is no interference with patient's circulation and potential alteration in neurovascular status.
9. Maintain restrained extremity in normal anatomic position. **Use a quick-release knot to tie the restraint to the bed frame, not side rail. The restraint may also be attached to a chair frame.** The site should not be readily accessible to patient.	Maintaining a normal position lessens possibility of injury. A quick-release knot ensures that restraint will not tighten when pulled and can be removed quickly in an emergency. Securing the restraint to a side rail may injure the patient when the side rail is lowered. Tying the restraint out of the patient's reach promotes security.
10. Remove PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents transmission of microorganisms.
11. Assess the patient at least every hour or according to facility policy. Assessment should include the placement of the restraint, neurovascular assessment of the affected extremity, and skin integrity.	Improperly applied restraints may cause skin tears, abrasions, or bruises. Decreased circulation may result in paleness, coolness, decreased sensation, tingling, numbness, or pain in extremity. Use of restraints may decrease environmental stimulation and result in sensory deprivation.
12. Remove restraint at least every 2 hours, or according to agency policy and patient need. Remove restraint at least every 2 hours for children ages 9 to 17 years and at least every 1 hour for children under age 9, or according to agency policy and patient need. Perform range-of-motion exercises.	Removal allows you to assess the patient and reevaluate need for restraint. It also allows interventions for toileting, provision of nutrition and liquids, exercise, and change of position. Exercise increases circulation in the restrained extremity.
13. Evaluate patient for continued need of restraint. Reapply restraint only if continued need is evident and order is still valid.	Continued need must be documented for reapplication.
14. Reassure patient at regular intervals. Provide continued explanation of rationale for interventions, reorientation if necessary, and plan of care.	Reassurance demonstrates caring and provides an opportunity for sensory situation as well as ongoing assessment and evaluation. Patient can use call bell to summon assistance quickly.

Applying a Waist Restraint

Waist restraints are a form of restraint that is applied to the patient's torso. It is applied over the patient's clothes, gown, or pajamas. When using a waist restraint, patients can move their extremi- ties but cannot get out of the chair or bed. Restraints should be used only after less-restrictive methods have failed. Ensure compliance with ordering, assessment, and maintenance procedures. Historically, vest or jacket restraints were used to prevent similar patient movement, but their use has significantly decreased due to concerns for the potential risk for asphyxiation with the device. Research suggests that waist restraints pose the same potential risk for asphyxial death as vest restraints (Capezuti, et al., 2008). Healthcare providers need to be aware of this potential outcome and weigh it against possible benefit from use of the device.

Equipment

- Waist restraint
- Additional padding as needed
- PPE, as indicated

Action	Rationale
1. Determine need for restraints.	Restraints should be used only as a last resort when alternative measures have failed and the patient is at increased risk for harming self or others.
2. Confirm agency policy for application of restraints. **Secure an order from the primary care provider, or validate that the order has been obtained within the past 24 hours.**	Policy protects the patient and the nurse and specifies guidelines for application as well as type of restraint and duration. **The Joint Commission (TJC) standards require that a new order for restraints must be written every 24 hours.**
3. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
4. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
5. Explain reason for restraint use to patient and family. Clarify how care will be given and how needs will be met. Explain that restraint is a temporary measure.	Explanation to patient and family may lessen confusion and anger and provide reassurance. A clearly stated agency policy on application of restraints should be available for patient and family to read. In a long-term care facility, the family must give consent before a restraint is applied.
6. Include the patient's family and/or significant others in the plan of care.	This promotes continuity of care and cooperation.
7. Apply restraint according to manufacturer's directions:	Proper application prevents injury.

a. Choose the least restrictive type of device that allows the greatest possible degree of mobility.	This provides minimal restriction.
b. Pad bony prominences that may be affected by the waist restraint.	Padding helps prevent skin injury.
c. Assist patient to a sitting position, if not contraindicated.	This will assist you in helping the patient into the waist restraint.
d. Place waist restraint on patient over gown. Bring ties through slots in restraint. Position slots at patient's back.	Placing the waist restraint over the gown protects the patient's skin. Positioning the slots with the ties at the back keeps them out of the patient's vision.
e. Pull the ties secure. Ensure that the restraint is not too tight and there are no wrinkles in it.	Securing too tightly could impede breathing. Wrinkles in the restraint may lead to skin impairment.
f. Insert fist between restraint and patient to ensure that breathing is not constricted. Assess respirations after restraint is applied.	This prevents impaired respiratiom
8. Use a quick-release knot to tie the restraint to the bed frame, not side rail. If patient is in a wheelchair, lock the wheels and place the ties under the arm rests and ties behind the chair. Site should not be readily accessible to the patient.	A quick-release knot ensures that restraint will not tighten when pulled and can be removed quickly in emergency. Securing the restraint to a side rail may injure the patient when the side rail is lowered. Tying restraint out of patient's reach promoted security.
9. Remove PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents transmission of microorganisms.
10. Assess the patient at least every hour or according to facility policy. Assessment should include the placement of the restraint, neurovascular assessment of the affected extremity, and skin integrity.	Improperly applied restraints may cause skin tears, abrasions, or bruises. Decreased circulation may result in paleness, coolness, decreased sensation, tingling, numbness, or pain in extremity. Use of restraints may decrease environmental stimulation and result in sensory deprivation.
11. Remove restraint at least every 2 hours, or according to agency policy and patient need. Remove restraint at least every 2 hours for children ages 9 to 17 years and at least every 1 hour for children under age 9, or according to agency policy and patient need. Perform range-of-motion exercises.	Removal allows you to assess the patient and reevaluate need for restraint. It also allows interventions for toileting, provision of nutrition and liquids, exercise, and change of position. Exercise increases circulation in the restrained extremity.
12. Evaluate patient for continued need of restraint. Reapply restraint only if continued need is evident and order is still valid.	Continued need must be documented for reapplication.
13. Reassure patient at regular intervals. Provide continued explanation of rationale for interventions, reorientation if necessary, and plan of care.	Reassurance demonstrates caring and provides an opportunity for sensory situation as well as ongoing assessment and evaluation. Patient can use call bell to summon assistance quickly.

Applying an Elbow Restraint

Elbow restraints are generally used on infants and children, but may be used with adults. They prevent the patient from bending the elbows and reaching incisions or therapeutic devices. The patient can move all joints and extremities except the elbow. **Restraints should be used only after less-restrictive methods have failed.** Ensure compliance with ordering, assessment, and maintenance procedures.

Equipment

- Elbow restraint
- Padding as necessary
- PPE, as indicated

Action	Rationale
1. Determine need for restraints.	Restraints should be used only as a last resort when alternative measures have failed and the patient is at increased risk for harming self or others.
2. Confirm agency policy for application of restraints. **Secure an order from the primary care provider, or validate that the order has been obtained within the past 24 hours.**	Policy protects the patient and the nurse and specifies guidelines for application as well as type of restraint and duration. **The Joint Commission (TJC) standards require that a new order for restraints must be written every 24 hours.**
3. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
4. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
5. Explain reason for restraint use to patient and family. Clarify how care will be given and how needs will be met. Explain that restraint is a temporary measure.	Explanation to patient and family may lessen confusion and anger and provide reassurance. A clearly stated agency policy on application of restraints should be available for patient and family to read. In a long-term care facility, the family must give consent before a restraint is applied.
6. Include the patient's family and/or significant others in the plan of care.	This promotes continuity of care and cooperation.
7. Apply restraint according to manufacturer's directions:	Proper application prevents injury.
a. Choose the correct size of the least restrictive type of device that allows the greatest possible degree of mobility.	This provides minimal restriction.

b. Pad bony prominences that may be affected by the restraint.	Padding helps prevent skin injury.
c. Spread elbow restraint out flat. Place middle of elbow restraint behind patient's elbow. The restraint should not extend below the wrist or place pressure on the axilla.	Elbow restraint should be placed in middle of arm to ensure that patient cannot bend the elbow. Patient should be able to move wrist. Pressure on the axilla may lead to skin impairment.
d. Wrap restraint snugly arounf patient's arm, but make sure that two fingers can easily fit under restraint.	Wrapping snuglyensures that patient will not be able to remove the device. Being able to insert two fingers helps to prevent impaired circulation and potential alterations in neurovascular status.
e. Secure Velcro straps around restraint.	Velcro straps will hold the restraint in place and prevent removal of the restraint.
f. Apply restraint to opposite arm if patient can move arm.	Bilateral elbow restraints are needed if patient can move both arms.
g. Thread Velcro strap from one elbow restraint across the back and into the loop on the opposite elbow restraint.	Strap across the back prevents patient from wiggling out of elbow restraints.
8. Assess circulation to fingers and hand.	Circulation should not be impaired from elbow restraint.
9. Remove PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents transmission of microorganisms.
10. Assess the patient at least every hour or according to facility policy. Assessment should include the placement of the restraint, neurovascular assessment of the affected extremity, and skin integrity.	Improperly applied restraints may cause skin tears, abrasions, or bruises. Decreased circulation may result in paleness, coolness, decreased sensation, tingling, numbness, or pain in extremity. Use of restraints may decrease environmental stimulation and result in sensory deprivation.
11. Remove restraint at least every 2 hours, or according to agency policy and patient need. Remove restraint at least every 2 hours for children ages 9 to 17 years and at least every 1 hour for children under age 9, or according to agency policy and patient need. Perform range-of-motion exercises.	Removal allows you to assess the patient and reevaluate need for restraint. It also allows interventions for toileting, provision of nutrition and liquids, exercise, and change of position. Exercise increases circulation in the restrained extremity.
12. Evaluate patient for continued need of restraint. Reapply restraint only if continued need is evident and order is still valid.	Continued need must be documented for reapplication.
13. Reassure patient at regular intervals. Provide continued explanation of rationale for interventions, reorientation if necessary, and plan of care.	Reassurance demonstrates caring and provides an opportunity for sensory situation as well as ongoing assessment and evaluation. Patient can use call bell to summon assistance quickly.

Applying a Mummy Restraint

A mummy restraint is appropriate for short-term restraint of an infant or small child to control the child's movements during examination or to provide care for the head and neck. **Restraints should be used only after less-restrictive methods have failed.** Ensure compliance with ordering, assessment, and maintenance procedures.

Equipment

- Small blanket or sheet
- PPE, as indicated

Action	Rationale
1. Determine need for restraints.	Restraints should be used only as a last resort when alternative measures have failed and the patient is at increased risk for harming self or others.
2. Confirm agency policy for application of restraints. **Secure an order from the primary care provider, or validate that the order has been obtained within the past 24 hours.**	Policy protects the patient and the nurse and specifies guidelines for application as well as type of restraint and duration. **The Joint Commission (TJC) standards require that a new order for restraints must be written every 24 hours.**
3. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
4. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
5. Explain reason for restraint use to patient and family. Clarify how care will be given and how needs will be met. Explain that restraint is a temporary measure.	Explanation to patient and family may lessen confusion and anger and provide reassurance. A clearly stated agency policy on application of restraints should be available for patient and family to read. In a long-term care facility, the family must give consent before a restraint is applied.
6. Include the patient's family and/or significant others in the plan of care.	This promotes continuity of care and cooperation.
7. Open the blanket or sheet. Place the child on the blanket, with edge of blanket at or above neck level.	This position child correctly on the blanket.
8. Position the child's right arm alongside the child's body. Left arm should not be constrained at this time. Pull the right side of the blanket tightly over the child's	Wrapping snugly ensures that child will not be able to wiggle out.

right shoulder and chest. Secure under the left side of the child's body.	
9. Position the left arm alongside the child's body. Pull the left side of the blanket tightly over the child's left shoulder and chest. Secure under the right side of the child's body.	Wrapping snugly ensures that child will not be able to wiggle out.
10. Fold the lower part of blanket up and pull over the child's body. Secure under the child's body on each side or with safety pins.	This ensures that child will not be able to wiggle out.
11. Stay with child while mummy wrap is in place. Reassure child and parents at regular intervals. Once examination or treatment is completed, unwrap child.	Remaing with the child prevents injury. Reassurance demonstrates caring and provides opportunity for ongoing assessment and evaluation.
12. Remove PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents transmission of microorganisms.

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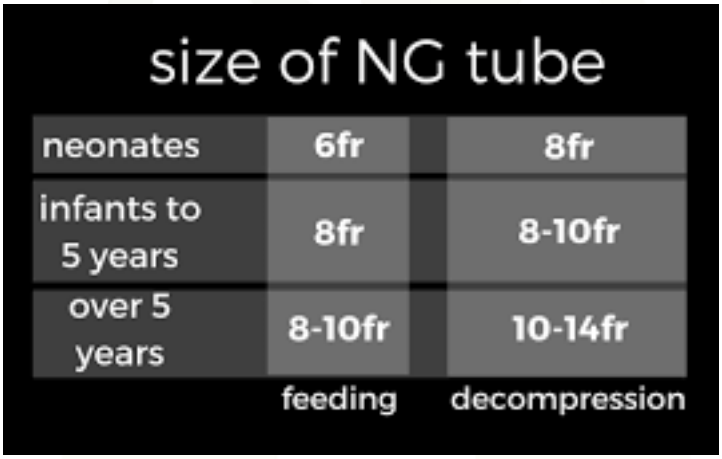
6. Nutrition

Inserting a Nasogastric (NG) Tube

The **nasogastric (NG) tube** is passed through the nose and into the stomach. This type of tube permits the patient to receive nutrition through a tube feeding using the stomach as a natural reservoir for food. Another purpose of an NG tube may be to decompress or to drain unwanted fluid and air from the stomach. This application would be used, for example, to allow the intestinal tract to rest and promote healing after bowel surgery. The NG tube can also be used to monitor bleeding in the gastrointestinal (GI) tract, to remove undesirable substances (lavage) such as poisons, or to help treat an intestinal obstruction.



Equipment

- Nasogastric tube of appropriate size
- Stethoscope
- Water-soluble lubricant
- Normal saline solution or sterile water, for irrigation, depending on facility policy
- Tongue blade
- Irrigations set, including a Toomey (20–50 mL)
- Flashlight
- Non-allergenic tape (1” wide)
- Tissues
- Glass of water with straw
- Topical anesthetic (lidocaine spray or gel) (optional)
- Clamp
- Suction apparatus (if ordered)
- Bath towel or disposable pad
- Emesis basin
- Safety pin and rubber band

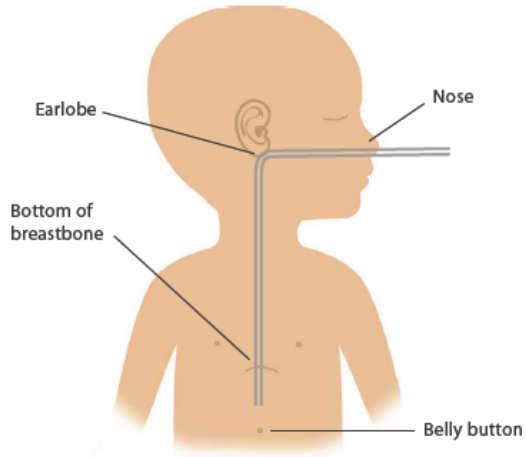
- Nonsterile disposable gloves
- Additional PPE, as indicated
- Tape measure, or other measuring device
- Skin barrier
- pH paper

Action	Rationale
1. Verify the medical order for insertion of an NG tube.	Ensures the patient receives the correct treatment.
2. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4. Explain the procedure to the patient and provide the rationale as to why the tube is needed. Discuss the associated discomforts that may be experienced and possible interventions that may allay this discomfort. Answer any questions as needed.	Explanation facilitates patient cooperation. Some patient surveys report that of all routine procedures, the insertion of an NG tube is considered the most painful. Lidocaine gel or sprays are possible options to decrease discomfort during NG tube insertion.
5. Gather equipment, including selection of the appropriate NG tube.	This provides for an organized approach to task. NG tubes should be radiopaque, contain clearly visible markings for measurement, and may have multiple ports for aspiration.
6. Close the patient's bedside curtain or door. Raise bed to a comfortable working position; usually elbow height of the caregiver (VISN 8, 2009). Assist the patient to high Fowler's position or elevate the head of the bed 45 degrees if the patient is unable to maintain upright position. Drape chest with bath towel or disposable pad. Have emesis basin and tissues handy.	Closing curtains or door provides for patient privacy. Having the bed at the proper height prevents back and muscle strain. Upright position is more natural for swallowing and protects against bronchial intubation aspiration, if the patient should vomit. Passage of tube may stimulate gagging and tearing of eyes.
7. Measure the distance to insert tube by placing tip of tube at patient's nostril and extending to tip of earlobe and then to tip of xiphoid process. Mark tube with an indelible	Measurement ensures that tube will be long enough to enter patient's stomach.

marker.

Measuring NG tube insertion distance

To help ensure the nasogastric (NG) tube is inserted to the correct distance, measure from the tip of the patient's nose to the earlobe, and from the earlobe to the point midway between the xiphoid process and umbilicus. To remember this, think "NEMU"—**N**ose, **E**ar, **M**id-**U**mbilicus.



8. Put on gloves. Lubricate tip of tube (at 2" – 4") water-soluble lubricant. Apply topical anesthetic to nostril and oropharynx, as appropriate.

Lubrication reduces friction and facilitates passage of the tube into stomach. Water-soluble lubricant will not cause pneumonia if tube accidentally enters the lungs. Topical anesthetics act as local anesthetics, reducing discomfort. Consult the physician for an order for a topical anesthetic such as lidocaine gel or spray if needed.

9. After selecting the appropriate nostril, ask patient to slightly flex head back against the pillow. Gently insert the tube into the nostril while directing the tube upward and backward along the floor of the nose. Patient may gag when tube reaches pharynx. Provide tissues for tearing or watering of eyes. Offer comfort and reassurance to the patient.

Following the normal contour of the nasal passage while inserting the tube reduces irritation and the likelihood of mucosal injury. The tube stimulates the gag reflex readily. Tears are a natural response as the tube passes into the nasopharynx. Many patients report that gagging and throat discomfort can be more painful than passing through the nostrils.

10. When pharynx is reached, instruct patient to touch chin to chest. Encourage patient to sip water through a straw or swallow even if no fluids are permitted. Advance tube in downward and backward direction when patient swallows.

Bringing the head forward helps close the trachea and open the esophagus. Swallowing helps advance the tube, causes the epiglottis to cover the opening of the trachea, and helps to eliminate gagging and coughing. Excessive coughing and gagging may occur if the tube has curled in

Stop when patient breathes. **If gagging and coughing persist, stop advancing the tube and check placement of tube with tongue blade and flashlight.** If tube is curled, straighten the tube and attempt to advance again. Keep advancing tube until pen marking is reached. **Do not use force. Rotate tube if it meets resistance.**	the back of throat. Forcing the tube may injure mucous membranes.
11. Discontinue procedure and remove tube if there are signs of distress, such as gasping, coughing, cyanosis, and inability to speak or hum.	The tube is in the airway if the patient shows signs of distress and cannot speak or hum. If after three attempts, nasogastric insertion is unsuccessful, another nurse may try or the patient should be referred to another healthcare professional.
12. Secure the tube loosely to the nose or cheek until it is determined that the tube is in the patient's stomach:	Securing with tape stabilizes the tube while position is being determined.
a. Attach syringe to end of tube and aspirate a small amount of stomach contents.	Thetubeisinthestomachifitscontentscanbeaspirated:pHof aspirate can then be tested to determine gastric placement. If unable to obtain specimen, reposition the patient and flush the tube with 30 mL of air. This action may be necessary several times. Current literature recommends that the nurse ensures proper placement of the NG tube by relying on multiple methods and not on one method alone.
b. Measure the pH of aspirated fluid using pH paper or a meter. Place a drop of gastric secretions onto pH paper or place small amount in plastic cup and dip the pH paper into it. Within 30 seconds, compare the color on the paper with the chart supplied by the manufacturer.	Current research demonstrates that the use of pH is predictive of correct placement. The pH of gastric contents is acidic (less than 5.5). If patient is taking an acid-inhibiting agent, the range may be 4.0 to 6.0. The pH of intestinal fluid is 7.0 or higher. The pH of respiratory fluid is 6.0 or higher. This method will not effectively differentiate between intestinal fluid and pleural fluid.
c. Visualize aspirated contents, checking for color and consistency.	Gastric fluid can be green with particles, off-white, or brown if old blood is present. Intestinal aspirate tends to look clear or straw- colored to a deep golden-yellow color. Also, intestinal aspirate may be greenish-brown if stained with bile. Respiratory or tracheobronchial fluid is usually off-white to tan and may be tinged with mucus. A small amount of blood-tinged fluid may be seen

	immediately after NG insertion.
d. Obtain radiograph (x-ray) of placement of tube, based on facility policy (and ordered by physician).	The x-ray is considered the most reliable method for identifying the position of the NG tube.
13. Apply skin barrier to tip and end of nose and allow to dry. Remove gloves and secure tube with a commercially prepared device (follow manufacturer's directions) or tape to patient's nose. To secure with tape: a. Cut a 4" piece of tape and split bottom 2" or use packaged nose tape for NG tubes. b. Place unsplit end over bridge of patient's nose. c. Wrap split ends under tubing and up and over on to nose. **Be careful not to pull tube too tightly against nose.**	Skin barrier improves adhesion and protects skin. Constant pressure of the tube against the skin and mucous membranes may cause tissue injury. Securing tube prevents migration of the tube inward and outward.
14. Put on gloves. Clamp tube and remove the syringe. Cap the tube or attach tube to suction according to the medical orders.	Suction provides for decompression of stomach and drainage of gastric contents.
15. Measure length of exposed tube. Reinforce marking on tube at nostril with indelible ink. Ask the patient to turn their head to the side opposite the nostril the tube is inserted. Secure tube to patient's gown by using rubber band or tape and safety pin. For additional support, tube can be taped onto patient's cheek using a piece of tape. **If a double-lumen tube (e.g., Salem sump) is used, secure vent above stomach level.** Attach at shoulder level.	Tube length should be checked and compared with this initial measurement, in conjunction with pH measurement and visual assessment of aspirate. An increase in the length of the exposed tube may indicate dislodgement (Bourgault, et al., 2007; Smeltzer et al., 2010). The tube should be marked with an indelible marker at the nostril. This marking should be assessed each time the tube is used to ensure the tube has not become displaced. Securing prevents tension and tugging on the tube. Turning the head ensures adequate slack in the tubing to prevent tension when the patient turns their head. Securing the double-lumen tube above stomach level prevents seepage of gastric contents and keeps the lumen clear for venting air.
16. Assist with or provide oral hygiene at 2- to 4-hour intervals. Lubricate the lips generously and clean nares and lubricate as needed. Offer analgesic throat lozenges or anesthetic spray for	Oral hygiene keeps mouth clean and moist, promotes comfort, and reduces thirst.

throat irritation if needed.

17. Remove equipment and return patient to a position of comfort. Remove gloves. Raise side rail and lower bed.	Promotes patient comfort and safety. Removing gloves properly reduces the risk for infection transmission and contamination of other items.
18. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents transmission of microorganisms.

Admininstering a Tube Feeding

Depending on the patient's physical and psychosocial condition and nutritional requirements, a feeding through the NG tube or other GI tube might be ordered. The steps for administering feedings are similar regardless of the tube used. Feeding can be provided on an intermittent or continuous basis. Intermittent feedings are delivered at regular intervals, using gravity for instillation or a feeding pump to administer the formula over a set period of time. Intermittent feedings might also be given as a bolus, using a syringe to instill the formula quickly in one large amount. Intermittent feedings are the preferred method, introducing the formula over a set period of time via gravity or pump. If the order calls for continuous feeding, an external feeding pump is needed to regulate the flow of formula. Continuous feedings permit gradual introduction of the formula into the GI tract, promoting maximal absorption. However, there is a risk of both reflux and aspiration with this method. Feeding intolerance is less likely to occur with smaller volumes. Hanging smaller amounts of feeding also reduces the risk for bacteria growth and contamination of feeding at room temperature (when using open systems).

Equipment

- Prescribed tube feeding formula at room temperature
- Feeding bag or prefilled tube feeding set
- Stethoscope
- Nonsterile gloves
- Additional PPE, as indicated
- Alcohol preps
- Disposable pad or towel
- Asepto or Toomey syringe
- Enteral feeding pump (if ordered)
- Rubber band
- Clamp (Hoffman or butterfly)
- IV pole
- Water for irrigation and hydration as needed
- pH paper
- Tape measure, or other measuring device

Action	Rationale
1. Assemble equipment. Check amount, concentration, type, and frequency of tube feeding on patient's chart. Check expiration date of formula.	This provides for organized approach to task. Checking ensures that correct feeding will be administered. Outdated formula may be contaminated.
2. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on

	transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4. Explain the procedure to the patient and why this intervention is needed. Answer any questions as needed.	Explanation facilitates patient cooperation.
5. Assemble equipment on overbed table within reach.	Organization facilitates performance of task.
6. Close the patient's bedside curtain or door. Raise bed to a comfortable working position, usually elbow height of the caregiver (VISN 8, 2009). Perform key abdominal assessments as described above.	Closing curtains or door provides for patient privacy. Having the bed at the proper height prevents back and muscle strain. Due to changes in patient's condition, assessment is vital before initiating the intervention.
7. Position patient with head of bed elevated at least 30 to 45 degrees or as near normal position for eating as possible. Swaddle an infant (wrap with the arms secured in a blanket). Put the infant on the left side, either in an infant seat or on a bed, with the head raised. Older children should be placed in a comfortable position, an may be held by an adult if they wish. Some children may vomit when the tube is put in. Be sure the child can be turned easily if this happens.	This position minimizes possibility of aspiration into trachea. Patients who are considered at high risk for aspiration should be assisted to at least a 45-degree position.
8. Put on gloves. Unpin tube from patient's gown. Verify the position of the marking on the tube at the nostril. Measure length of exposed tube and compare with the documented length.	Gloves prevent contact with blood and body fluids. The tube should be marked with an indelible marker at the nostril. This marking should be assessed each time the tube is used to ensure the tube has not become displaced. Tube length should be checked and compared with this initial measurement, in conjunction with pH measurement and visual assessment of aspirate. An increase in the length of the exposed tube may indicate dislodgement (Bourgault, et al., 2007; Smeltzer et al., 2010).
9. Attach syringe to end of tube and aspirate a small	The tube is in the stomach if its contents can be aspirated: pH of aspirate can then be tested to

amount of stomach contents.	determine gastric placement. If unable to obtain specimen, reposition the patient and flush the tube with 30 mL of air. This action may be necessary several times. Current literature recommends that the nurse ensures proper placement of the NG tube by relying on multiple methods and not on one method alone.
10. Check the pH .	Current research demonstrates that the use of pH is predictive of correct placement. The pH of gastric contents is acidic (less than 5.5). If patient is taking an acid-inhibiting agent, the range may be 4.0 to 6.0. The pH of intestinal fluid is 7.0 or higher. The pH of respiratory fluid is 6.0 or higher. This method will not effectively differentiate between intestinal fluid and pleural fluid. The testing for pH before the next feeding in intermittent feedings is conducted since the stomach has been emptied of the feeding formula. However, if the patient is receiving continuous feedings, the pH measurement is not as useful, since the formula raises the pH.
11. Visualize aspirated contents, checking for color and consistency.	Gastric fluid can be green with particles, off-white, or brown if old blood is present. Intestinal aspirate tends to look clear or straw-colored to a deep golden-yellow color. Also, intestinal aspirate may be greenish-brown if stained with bile. Respiratory or tra-cheobronchial fluid is usually off-white to tan and may be tinged with mucus. A small amount of blood-tinged fluid may be seen immediately after NG insertion.
12. If it is not possible to aspirate contents; assessments to check placement are inconclusive; the exposed tube length has changed; or there are any other indications that the tube is not in place, check placement by x-ray.	The x-ray is considered the most reliable method for identifying the position of the NG tube.
13. After multiple steps have been taken to ensure that the feeding tube is located in the stomach or small intestine, **aspirate all gastric contents with the syringe and**	Checking for residual before each feeding or every 4 to 6 hours during a continuous feeding according to institutional policy is implemented

measure to check for the residual amount of feeding in the stomach. Return the **residual** based on facility policy. Proceed with feeding if amount of residual does not exceed agency policy or the limit indicated in the medical record.	to identify delayed gastric emptying. Research suggests continuing the feedings with residuals up to 400 mL. If greater than 400 mL, confer with physician or hold feedings according to agency policy. For patients who are experiencing gastric dysfunction or decreased level of consciousness, feedings may be held for smaller residual amounts (<400 mL) (Bourgault et al., 2007; Keithley & Swanson, 2004; Metheny, 2008). Research findings are inconclusive on the benefit of returning gastric volumes to the stomach or intestine to avoid fluid or electrolyte imbalance, which has been accepted practice. Consult agency policy concerning this practice.
14. Flush tube with 30 mL of water for irrigation. Disconnect syringe from tubing and cap end of tubing while preparing the formula feeding equipment. Remove gloves.	Flushing tube prevents occlusion. Capping the tube deters the entry of microorganisms and prevents leakage onto the bed linens.
15. Put on gloves before preparing, assembling and handling any part of the feeding system.	Gloves prevent contact with blood and body fluids and deter transmission of contaminants to feeding equipment and/or formula.
16. Administer feeding.	
When Using a Feeding Bag (Open System)	
a. Label bag and/or tubing with date and time. Hang bag on IV pole and adjust to about 6 inches above the stomach. Clamp tubing.	Labeling date and time of first use allows for disposal within 24 hours, to deter growth of microorganisms. Proper feeding bag height reduces risk of formula being introduced too quickly.
b. Check the expiration date of the formula. Cleanse top of feeding container with a disinfectant before opening it. Pour formula into feeding bag and allow solu tion to run through tubing. Close clamp.	Cleansing container top with alcohol minimizes risk for contaminants entering feeding bag (Padula, et al., 2004). Formula displaces air in tubing.
c. Attach feeding setup to feeding tube,open clamp and regulate drip according to the medical order, or allow feeding to run in over 30 minutes.	Introducing formula at a slow, regular rate allows the stomach to accommodate to the feeding and decreases GI distress.

d. Add water for irrigation to feeding bag when feeding is almost completed and allow it to run through the tube.	Water rinses the feeding from the tube and helps to keep it patent.
e. Clamp tubing immediately after water has been instilled. Disconnect **feeding setup** from feeding tube. Clamp tube and cover end with cap.	Clamping the tube prevents air from entering the stomach. Capping the tube deters entry of microorganisms and covering end of tube protects patient and linens from fluid leakage from tube.

When Using a Large Syringe (Open System)

a. Remove plunger from 30- or 60-mL syringe.	
b. Attach syringe to feeding tube, pour premeasured amount of tube feeding formula into syringe, open clamp, and allow food to enter tube. **Regulate rate, fast or slow, by height of the syringe. Do not push formula with syringe plunger.**	Introducing the formula at a slow, regular rate allows the stomach to accommodate to the feeding and decreases GI distress. The higher the syringe is held, the faster the formula flows.
c. Add 30 to 60mL (1–2oz) of water for irrigation to syringe when feeding is almost completed, and allow it to run through the tube.	Water rinses the feeding from the tube and helps to keep it patent.
d. When syringe has emptied, hold syringe high and discon- nect from tube. Clamp tube and cover end with cap.	By holding syringe high, the formula will not backflow out of tube and onto patient. Clamping the tube prevents air from entering the stomach. Capping end of tube deters entry of microorganisms. Covering the end protects patient and linens from fluid leakage from tube.

When Using an Enteral Feeding Pump

a. Close flow-regulator clamp on tubing and fill feeding bag with prescribed formula. Amount used depends on agency policy. Place label on container with patient's name, date, and time the feeding was hung.	Closing clamp prevents formula from moving through tubing until nurse is ready. Labeling date and time of first use allows for disposal within 24 hours, to deter growth of microorganisms.
b. Hang feeding container on IV pole. **Allow solution to flow through tubing.**	This prevents air from being forced into the stomach or intestines.
c. Connect to feeding pump following manufacturer's directions. Set rate. Maintain the patient in the upright position throughout the feeding. If the patient needs to temporarily lie flat, the feeding should be paused. The	Feeding pumps vary. Some of the newer pumps have built-in safeguards that protect the patient from complications. Safety features include cassettes that prevent free-flow of formula,

feeding may be resumed after the patient's position has been changed back to at least 30 to 45 degrees.	automatic tube flush, safety tips that prevent accidental attachment to an IV setup, and various audible and visible alarms. Feedings are started at full strength rather than diluting the feeding, which was recommended previously. A smaller volume, 10 to 40 mL, of feeding infused per hour and gradually increased has been shown to be more easily tolerated by patients.
d. Check placement of tube and gastric residual every 4 to 6 hours.	Checking placement verifies the tube has not moved out of the stomach. Checking gastric residual (outlined in Step 7) monitors absorption of the feeding and prevents distention, which could lead to aspiration. However, presence of large amounts of residual, such as more than 250 to 400 mL, should not be the sole criteria for stopping the enteral feeding (Bourgault, et al., 2007; Metheny, 2008).
17. Observe the patient's response during and after tube feeding and assess the abdomen at least once a shift.	Pain or nausea may indicate stomach distention, which may lead to vomiting. Physical signs such as abdominal distention and firmness or regurgitation of tube feeding may indicate intolerance.
18. Have patient remain in upright position for at least 1 hour after feeding.	This position minimizes risk for backflow and discourages aspiration, if any reflux or vomiting should occur.
19. Remove equipment and return patient to a position of comfort. Remove gloves. Raise side rail and lower bed.	Promotes patient comfort and safety. Removing gloves properly reduces the risk for infection transmission and contamination of other items.
20. Put on gloves. Wash and clean equipment or replace according to agency policy. Remove gloves.	This prevents contamination and deters spread of microorganisms. Reusable systems are cleansed with soap and water with each use and replaced every 24 hours. Refer to agency's policy and manufacturers' guidelines for specifics on equip ment care.
21. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents transmission

of microorganisms.

Removing a Nasogratric (NG) Tube

When the NG tube is no longer necessary for treatment, the physician will order the tube to be removed. The NG tube is removed as carefully as it was inserted, to provide as much comfort as possible for the patient and to prevent complications. When the tube is removed, the patient must hold his or her breath to prevent aspiration of any secretions or fluid left in the tube as it is removed.

Equipment

- Tissues
- 50-mL syringe (optional)
- Nonsterile gloves
- Additional PPE, as indicated
- Stethoscope
- Disposable plastic bag
- Bath towel or disposable pad
- Normal saline solution for irrigation (optional)
- Emesis basin

Action	Rationale
1. Check medical order for removal of NG tube.	This ensures correct implementation of physician's order.
2. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient receives the intervention and helps prevent errors.
4. Explain the procedure to the patient and why this intervention is warranted. Describe that it will entail a quick few moments of discomfort. Perform key abdominal assessments as described above.	Patient cooperation is facilitated when explanations are provided. Due to changes in patient's condition, assessment is vital before initiating intervention.
5. Pull the patient's bedside curtain. Raise bed to a comfortable working position, usually elbow height of the caregiver (VISN 8, 2009). Assist the patient into a 30- to 45-degree position. Place towel or disposable pad across patient's chest. Give tissues and emesis basin to patient.	Provides for privacy. Appropriate working height facilitates comfort and proper body mechanics for the nurse. Towel or pad protects patient from contact with gastric secretions. Emesis basin is helpful if patient vomits or gags. Tissues are necessary if

	patient wants to blow his or her nose when tube is removed.
6. Put on gloves. Discontinue suction and separate tube from suction. Unpin tube from patient's gown and carefully remove adhesive tape from patient's nose.	Gloves prevent contact with blood and body fluids. Disconnecting tube from suction and the patient allows for its unrestricted removal.
7. Check placement and **attach syringe and flush with 10 mL of water or normal saline solution (optional) or clear with 30 to 50 mL of air.**	Air or saline solution clears the tube of secretions, feeding, or debris.
8. Clamp tube with fingers by doubling tube on itself. Instruct patient to take a deep breath and hold it. Quickly and carefully remove tube while patient holds breath. Coil the tube in the disposable pad as you remove from the patient.	Clamping prevents drainage of gastric contents into the pharynx and esophagus. The patient holds their breath to prevent accidental aspiration of gastric secretions in tube.
9. Dispose of tube per agency policy. Remove gloves and place in bag. Perform hand hygiene.	This prevents contamination with microorganisms. Follow the biohazard policy of the institution.
10. Offer mouth care to patient and facial tissue to blow nose. Lower the bed and assist the patient to a position of comfort as needed.	These interventions promote patient comfort.
11. Remove equipment and raise side rail and lower bed.	Promotes patient comfort and safety.
12. Put on gloves and measure the amount of nasogastric drainage in the collection device and record on output flow record, subtracting irrigant fluids if necessary. Add solidifying agent to nasogastric drainage according to hospital policy.	Irrigation fluids are considered intake. To obtain the true nasogastric drainage, irrigant fluid amounts are subtracted from the total nasogastric drainage. Nasogastric drainage is recorded as part of the output of fluids from the patient. Solidifying agents added to liquid nasogastric drainage facilitate safe biohazard disposal.
13. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents transmission of microorganisms.

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7. Medications

Administering Oral Medications

Drugs given orally are intended for absorption in the stomach and small intestine. The oral route is the most commonly used route of administration. It is usually the most convenient and comfortable route for the patient. After oral administration, drug action has a slower onset and a more prolonged, but less potent, effect than other routes.

Equipment

- Medication in disposable cup or oral syringe
- Liquid (e.g., water, juice) with straw, if not contraindicated
- Medication cart or tray
- Computer-generated Medication Administration Record (CMAR) or Medication Administration Record (MAR)
- PPE, as indicated

Action	Rationale
1. Gather equipment. Check each medication order against the original in the medical record, according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.
4. Move the medication cart to the outside of the patient's room or prepare for administration in the medication area.	Organization facilitates error-free administration and saves time.
5. Unlock the medication cart or drawer. Enter pass code into the computer and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use. Entering pass code and scanning ID allows only authorized users into the computer system and identifies the user for

	documentation by the computer.
6. Prepare medications for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the first check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the second check of the label. Verify calculations with another nurse to ensure safety, if necessary.
9. Prepare the required medications:	
a. Unit dose packages: Place unit dose-packaged medications in a disposable cup. **Do not open the wrapper until at the bedside.** Keep narcotics and medications that require special nursing assessments in a separate container.	Wrapper is kept intact because the label is needed for an additional safety check. Special assessments may be required before giving certain medications. These may include assessing vital signs and checking laboratory test results.
b. Multidose containers: When removing tablets or capsules from a multidose bottle, pour the necessary number into the bottle cap and then place the tablets or capsules in a medication cup. Break only scored tablets, if necessary, to obtain the proper dosage. Do not touch tablets or capsules with hands.	Pouring medication into the cap allows for easy return of excess medication to the bottle. Pouring tablets or capsules your hand is unsanitary.
c. Liquid medication in multidose bottle: When pouring liquid medications out of a multidose bottle, hold the bottle so the label is against the palm. Use the appropriate measuring device when pouring liquids, and read the amount of medication at the bottom of the meniscus at eye level. Wipe the lip of the bottle with a paper towel.	Liquid that may drip onto the label makes the label difficult to read. Accuracy is possible when the appropriate measuring device is used and then read accurately.
10. When all medications for one patient have been prepared, recheck the labels with the CMAR/MAR before taking the medications to the patient. Replace any multidose containers in the patient's drawer or unit stock. Lock the medication cart before leaving it.	This is a third check to ensure accuracy and to prevent errors. Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
11. Transport medications to the patient's bedside carefully, and	Careful handling and close observation

keep the medications in sight at all times.	prevent accidental or deliberate disarrangement of medications.
12. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after the designated time.
13. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
14. Identify the patient. Usually, the patient should be identified using two methods. Compare the information with the CMAR/MAR.	Identifying the patient ensures that the right patient receives the medications and helps prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.
b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient, for the second source.	This is another way to double check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
15. Scan the patient's bar code on the identification band, if required.	The bar code provides an additional check to ensure that the medication is given to the right patient.
16. Complete necessary assessments before administering medications. Check the patient's allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of each medication to the patient and family.	Assessment is a prerequisite to administration of medications.
17. Assist the patient to an upright or lateral position.	Swallowing is facilitated by proper positioning. An upright or side-lying position protects the patient from aspiration.
18. Administer medications:	

a. Offer water or other permitted fluids with pills, capsules, tablets, and some liquid medications.	Liquids facilitate swallowing of solid drugs. Some liquid drugs are intended to adhere to the pharyngeal area, in which case liquid is not offered with the medication.
b. Ask whether the patient prefers to take the medications by hand or in a cup.	This encourages the patient's participation in taking the medications.
19. Remain with the patient until each medication is swallowed. Never leave medication at the patient's bedside.	Unless you have seen the patient swallow the drug, the drug cannot be recorded as administered. The patient's chart is a legal record. Only with a physician's order can medications be left at the bedside.
20. Assist the patient to a comfortable position. Remove PPE, if used. Perform hand hygiene.	Promotes patient comfort. Proper removal of PPE prevents transmission of microorganisms. Hand hygiene deters the spread of microorganisms.
21. Document the administration of the medication immediately after administration.	Timely documentation helps to ensure patient safety.
22. Evaluate the patient's response to medication within appropriate time frame.	The patient needs to be evaluated for therapeutic and adverse effects from the medication.

Administering Intradermal Injection

Intradermal injections are administered into the dermis, just below the epidermis. The intradermal route has the longest absorption time of all parenteral routes. For this reason, intradermal injections are used for sensitivity tests, such as tuberculin and allergy tests, and local anesthesia. The advantage of the intradermal route for these tests is that the body's reaction to substances is easily visible, and degrees of reaction are discernible by comparative study.

Sites commonly used are the inner surface of the forearm and the upper back, under the scapula. Equipment used for an intradermal injection includes a tuberculin syringe calibrated in tenths and hundredths of a milliliter and a ¼- to ½-inch, 26- or 27-gauge needle. The dosage given intrader

mally is small, usually less than 0.5 mL. The angle of administration for an intradermal injection is 5 to 15 degrees.

Equipment

- Prescribed medication
- Sterile syringe, usually a tuberculin syringe calibrated in tenths and hundredths, and needle, ¼- to ½-inch, 26- or 27-gauge
- Antimicrobial swab
- Disposable gloves
- Small gauze square
- Computer-generated Medication Administration Record (CMAR) or Medication Administration Record (MAR)
- PPE, as indicated

Action	Rationale
1. Gather equipment. Check each medication order against the original order in the medical record according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.

4. Move the medication cart to the outside of the patient's room or prepare for administration in the medication area.	Organization facilitates error-free administration and saves time.
5. Unlock the medication cart or drawer. Enter pass code and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use. Entering pass code and scanning ID allows only authorized users into the system and identifies user for documentation by the computer.
6. Prepare medications for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the *first* check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the *second* check of the label. Verify calculations with another nurse to ensure safety.
9. If necessary, withdraw medication from an ampule or vial.	
10. When all medications for one patient have been prepared, recheck the label with the CMAR/MAR before taking the medications to the patient.	This is a *third* check to ensure accuracy and to prevent errors. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
11. Lock the medication cart before leaving it.	Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use.
12. Transport medications to the patient's bedside carefully, and keep the medications in sight at all times.	Careful handling and close observation prevent accidental or deliberate disarrangement of medications.
13. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after the designated time.
14. Perform hand hygiene and put on PPE, if	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on

indicated.	transmission precautions.
15. Identify the patient. Usually, the patient should be identified using two methods. Compare information with the CMAR/MAR.	Identifying the patient ensures the right patient receives the medications and helps prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.
b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient for the second source.	This is another way to double-check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
16. Close the door to the room or pull the bedside curtain.	This provides patient privacy.
17. Complete necessary assessments before administering medications. Check allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of the medication to the patient and family.	Assessment is a prerequisite to administration of medications. Explanation provides rationale, increases knowledge, and reduces anxiety.
18. Scan the patient's bar code on the identification band, if required.	Provides an additional check to ensure that the medication is given to the right patient.
19. Put on clean gloves.	Gloves help prevent exposure to contaminants.
20. Select an appropriate administration site. Assist the patient to the appropriate position for the site chosen. Drape as needed to expose only area of site to be used.	Appropriate site prevents injury and allows for accurate reading of the test site at the appropriate time. Draping provides privacy and warmth.
21. Cleanse the site with an antimicrobial swab while wiping with a firm, circular motion and moving outward from the injection site. Allow the skin to dry.	Pathogens on the skin can be forced into the tissues by the needle. Moving from the center outward prevents contamination of the site. Allowing skin to dry prevents introducing alcohol into the tissue, which can be irritating and uncomfortable.
22. Remove the needle cap with the nondominant	This technique lessens the risk of an accidental

hand by pulling it straight off.	needlestick.
23. Use the nondominant hand to spread the skin taut over the injection site.	Taut skin provides an easy entrance into intradermal tissue.
24. Hold the syringe in the dominant hand, between the thumb and forefinger with the bevel of the needle up.	Using the dominant hand allows for easy, appropriate handling of the syringe. Having the bevel up allows for smooth piercing of the skin and introduction of medication into the dermis.
25. Hold the syringe at a 5- to 15-degree angle from the site. **Place the needle almost flat against the patient's skin, bevel side up, and insert the needle into the skin. Insert the needle only about ⅛ inch with entire bevel under the skin.**	The dermis is entered when the needle is held as nearly parallel to the skin as possible and is inserted about ⅛ inch.
26. Once the needle is in place, steady the lower end of the syringe. Slide your dominant hand to the end of the plunger.	Prevents injury and inadvertent advancement or withdrawal of needle.
27. Slowly inject the agent while watching for a small wheal or blister to appear.	The appearance of a wheal indicates the medication is in the dermis.
28. Withdraw the needle quickly at the same angle that it was inserted. Do not recap the used needle. Engage the safety shield or needle guard.	Withdrawing the needle quickly and at the angle at which it entered the skin minimizes tissue damage and discomfort for the patient. Safety shield or needle guard prevents accidental needlestick injury.
29. Do not massage the area after removing needle. Tell patient not to rub or scratch the site. If necessary, gently blot the site with a dry gauze square. Do not apply pressure or rub the site.	Massaging the area where an intradermal injection is given may spread the medication to underlying subcutaneous tissue.
30. Assist the patient to a position of comfort.	This provides for the well-being of the patient.
31. Discard the needle and syringe in the appropriate receptacle.	Proper disposal of the needle prevents injury.
32. Remove gloves and additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.
33. Document the administration of the medication immediately after administration.	Timely documentation helps to ensure patient safety.

34. Evaluate the patient's response to medication within appropriate time frame.

The patient needs to be evaluated for therapeutic and adverse effects from the medication.

35. Observe the area for signs of a reaction at determined intervals after administration. Inform the patient of the need for inspection.

With many intradermal injections, you need to look for a localized reaction in the area of the injection at the appropriate interval(s) determined by the type of medication and purpose. Explaining this to the patient increases compliance.

Administering Subcutaneous Injection

Subcutaneous injections are administered into the adipose tissue layer just below the epidermis and dermis. This tissue has few blood vessels, so drugs administered here have a slow, sustained rate of absorption into the capillaries.

It is important to choose the right equipment to ensure depositing the medication into the intended tissue layer and not the underlying muscle. Equipment used for a subcutaneous injection includes a syringe of appropriate volume for the amount of drug being administered. An insulin pen may be used for subcutaneous injection of insulin (see the accompanying Skill Variation for technique). A 25- to 30-gauge, ⅜- to 1-inch needle can be used; ⅜- and ⅝-inch sized needles are most commonly used. Some medications are packaged in prefilled cartridges with a needle attached. Confirm that the provided needle is appropriate for the patient before use. If not, the medication will have to be transferred to another syringe and the appropriate needle attached.

Review the specifics of the particular medication before administrating it to the patient. Various sites may be used for subcutaneous injections, including the outer aspect of the upper arm, the abdomen (from below the costal margin to the iliac crests), the anterior aspects of the thigh, the upper back, and the upper ventral gluteal area. Figure 1 displays the sites on the body where subcutaneous injections can be given. Absorption rates are different from the different sites. Injections in the abdomen are absorbed most rapidly, absorbed somewhat slower from the arms, even slower from the thighs, and slowest from the upper ventral gluteal areas (American Diabetes Association, 2004; Caffrey, 2003).

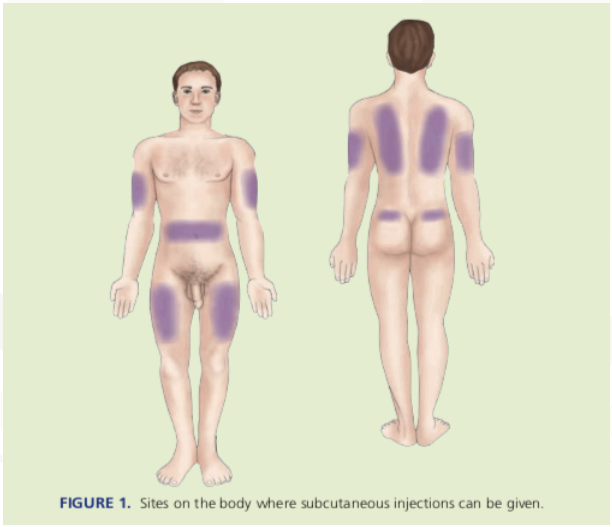

FIGURE 1. Sites on the body where subcutaneous injections can be given.

Subcutaneous injections are administered at a 45- to 90-degree angle. Choose the angle of needle insertion based on the amount of subcutaneous tissue present and the length of the needle. Choose the needle length based on the amount of subcutaneous tissue present, based on the patient's body weight and build (Annersten & Willman, 2005). Generally, insert the shorter, ⅜-inch needle at a 90-degree angle and the longer, ⅝-inch needle at a 45-degree angle.

Aspiration, or pulling back on the plunger to check that a blood vessel has been entered, is not necessary and has not proved to be a reliable indicator of needle placement. The likelihood of injecting into a blood vessel is small (Rushing, 2004; Stephens, 2003). The American Diabetes Association (2004) has stated that routine aspiration is not necessary when injecting insulin. Aspiration is definitely contraindicated with administration of heparin because this action can result in hematoma formation.

Usually, no more than 1 mL of solution is given subcutaneously. Giving larger amounts adds to the patient's discomfort and may predispose to poor absorption.

Equipment

- Prescribed medication
- Sterile syringe and needle. Needle size depends on the medication administered and patient body type
- Antimicrobial swab
- Disposable gloves
- Small gauze square
- Computer-generated Medication Administration Record (CMAR) or Medication Administration Record (MAR)
- PPE, as indicated

Action	Rationale
1. Gather equipment. Check each medication order against the original order in the medical record, according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.
4. Move the medication cart to the outside of the patient's room or prepare for administration in the medication area.	Organization facilitates error-free administration and saves time.
5. Unlock the medication cart or drawer. Enter pass code and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use. Entering pass code and scanning ID allows only authorized users into the system and

	identifies user for documentation by the computer.
6. Prepare medications for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the *first* check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the *second* check of the label. Verify calculations with another nurse to ensure safety, if necessary.
9. If necessary, withdraw medication from an ampule or vial.	
10. When all medications for one patient have been prepared, recheck the label with the MAR before taking medications to the patient.	This is a *third* check to ensure accuracy and to prevent errors. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
11. Lock the medication cart before leaving it.	Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use.
12. Transport medications to the patient's bedside carefully, and keep the medications in sight at all times.	Careful handling and close observation prevent accidental or deliberate disarrangement of medications.
13. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after the designated time.
14. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
15. Identify the patient. Usually, the patient should be identified using two methods. Compare information with the CMAR/MAR.	Identifying the patient ensures the right patient receives the medications and helps prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.

b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient for the second source.	This is another way to double-check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
16. Close the door to the room or pull the bedside curtain.	This provides patient privacy.
17. Complete necessary assessments before administering medications. Check the patient's allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of the medication to the patient and family.	Assessment is a prerequisite to administration of medications. Explanation provides rationale, increases knowledge, and reduces anxiety.
18. Scan the patient's bar code on the identification band, if required.	Scanning provides an additional check to ensure that the medication is given to the right patient.
19. Put on clean gloves.	Gloves help prevent exposure to contaminants.
20. Select an appropriate administration site.	Appropriate site prevents injury and allows for accurate reading of the test site at the appropriate time.
21. Assist the patient to the appropriate position for the site chosen. Drape, as needed, to expose only area of site to be used.	Appropriate site prevents injury. Draping helps maintain the patient's privacy.
22. Identify the appropriate landmarks for the site chosen.	Good visualization is necessary to establish the correct location of the site and to avoid damage to tissues.
23. Cleanse the area around the injection site with an antimicrobial swab. Use a firm, circular motion while moving outward from the injection site. Allow area to dry.	Pathogens on the skin can be forced into the tissues by the needle. Moving from the center outward prevents contamination of the site. Allowing skin to dry prevents introducing alcohol into the tissue, which can be irritating and uncomfortable.
24. Remove the needle cap with the nondominant hand, pulling it straight off.	The cap protects the needle from contact with microorganisms. This technique lessens the risk of an accidental needlestick.
25. Grasp and bunch the area surrounding the injection	Decision to create a skin fold is based on the

site or spread the skin taut at the site.	nurse's assessment of the patient and needle length used. Pinching is advised for thinner patients and when a longer needle is used, to lift the adipose tissue away from underlying muscle and tissue. If pinching is used, once the needle is inserted, release the skin to avoid injecting into compressed tissue. If skin is pulled taut, it provides easy, less painful entry into the subcutaneous tissue.
26. Hold the syringe in the dominant hand between the thumb and forefinger. Inject the needle quickly at a 45- to 90- degree angle.	Inserting the needle quickly causes less pain to the patient. Subcutaneous tissue is abundant in well-nourished, well-hydrated people and spare in emaciated, dehydrated, or very thin persons. For a person with little subcutaneous tissue, it is best to insert the needle at a 45-degree angle.
27. After the needle is in place, release the tissue. If you have a large skin fold pinched up, ensure that the needle stays in place as the skin is released. Immediately move your nondominant hand to steady the lower end of the syringe. Slide your dominant hand to the end of the plunger. Avoid moving the syringe.	Injecting the solution into compressed tissues results in pressure against nerve fibers and creates discomfort. If there is a large skin fold, the skin may retract away from the needle. The non-dominant hand secures the syringe. Moving the syringe could cause damage to the tissues and inadvertent administration into incorrect area.
28. Inject the medication slowly (at a rate of 10 sec/mL).	Rapid injection of the solution creates pressure in the tissues, resulting in discomfort.
29. Withdraw the needle quickly at the same angle at which it was inserted, while supporting the surrounding tissue with your nondominant hand.	Slow withdrawal of the needle pulls the tissues and causes discomfort. Applying counter traction around the injection site helps to prevent pulling on the tissue as the needle is withdrawn. Removing the needle at the same angle at which it was inserted minimizes tissue damage and discomfort for the patient.
30. Using a gauze square, apply gentle pressure to the site after the needle is withdrawn. Do not massage the site.	Massaging the site is not necessary and can damage underlying tissue and increase the absorption of the medication. Massaging after heparin administration can contribute to hematoma formation. Massaging after an insulin injection may contribute to unpredictable absorption of the medication.
31. Do not recap the used needle. Engage the safety shield or needle guard. Discard the needle and syringe	Safety shield or needle guard prevents accidental needlestick. Proper disposal of the needle prevents

in the appropriate receptacle.	injury.
32. Assist the patient to a position of comfort.	This provides for the well-being of the patient.
33. Remove gloves and additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.
34. Document the administration of the medication immediately after administration.	Timely documentation helps to ensure patient safety.
35. Evaluate the patient's response to the medication within an appropriate time frame for the particular medication.	The patient needs to be evaluated for therapeutic and adverse effects from the medication.

Administering Intramuscular Injection

Intramuscular injections deliver medication through the skin and subcutaneous tissues into certain muscles. Muscles have a larger and a greater number of blood vessels than subcutaneous tissue, allowing faster onset of action than with subcutaneous injections. An intramuscular injection is chosen when a reasonably rapid systemic uptake of the drug is needed by the body and when a relatively prolonged action is required (Hunter & Clark, 2008). Some medications administered intramuscularly are formulated to have a longer duration of effect. The deposit of medication creates a depot at the site of injection, designed to deliver slow, sustained release over hours, days, or weeks.

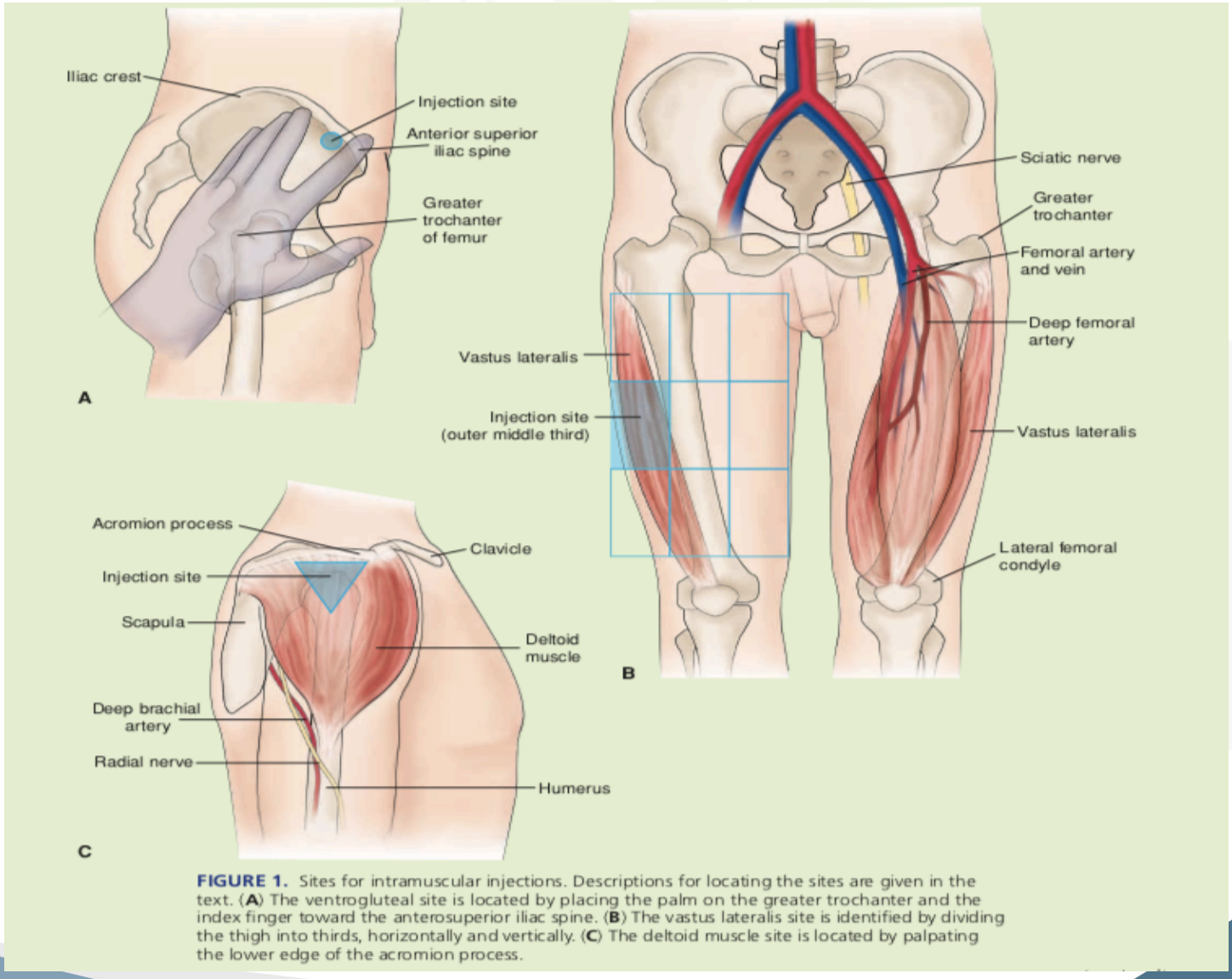

FIGURE 1. Sites for intramuscular injections. Descriptions for locating the sites are given in the text. (**A**) The ventrogluteal site is located by placing the palm on the greater trochanter and the index finger toward the anterosuperior iliac spine. (**B**) The vastus lateralis site is identified by dividing the thigh into thirds, horizontally and vertically. (**C**) The deltoid muscle site is located by palpating the lower edge of the acromion process.

To administer an intramuscular injection correctly and effectively, choose the right equipment, select the appropriate location, use the correct technique, and deliver the correct dose. Inject the medication into the denser part of the muscle fascia below the subcutaneous tissues. This is ideal because skeletal muscles have fewer pain-sensing nerves than subcutaneous tissue and can absorb larger volumes of solution because of the rapid uptake of the drug into the bloodstream via the muscle fibers (Hunter, 2008).

It is important to choose the right needle length for a particular intramuscular injection. Needle length should be based on the site for injection and the patient's age. Patients who are obese may require a longer needle, and emaciated patients may require a shorter needle. Appropriate gauge is determined by the medication being administered. Generally, biologic agents and medications in aqueous solutions should be administered with a 20- to 25-gauge needle. Medications in oil-based solutions should be administered with an 18- to 25-gauge needle. Many medications come in prefilled syringe units. If a needle is provided on the prefilled unit, ensure that the needle on the unit is the appropriate length for the patient and situation.

To avoid complications, be able to identify anatomic landmarks and site boundaries.

Consider the age of the patient, medication type, and medication volume when selecting a site for intramuscular injection. Rotate the sites used to administer intramuscular medications when therapy requires repeated injections. Whatever pattern of rotating sites is used, a description of it should appear in the patient's plan of nursing care.

Use accurate, careful technique when administering intramuscular injections. If care is not taken, possible complications include abscesses; cellulites; injury to blood vessels, bones, and nerves; lingering pain; tissue necrosis; and periostitis (inflammation of the membrane covering a bone). Administer the intramuscular injection so that the needle is perpendicular to the patient's body. This ensures it is given using an angle of injection between 72 and 90 degrees (Nicoll & Hesby, 2002).

The volume of medication that can be administered intramuscularly varies based on the intended site. Generally, 1 to 4 mL is the accepted volume range, with no more than 1 to 2 mL given at the deltoid site. The less-developed muscles of children and elderly people limit the intramuscular injection to 1 to 2 mL.

A previously included practice associated with intramuscular injections is the inclusion of aspiration; the process of pulling back on the plunger of the syringe before injection to ensure the medication is not injected into a blood vessel. According to the CDC (2009), aspiration is not required.

TABLE • 5-1 INTRAMUSCULAR INJECTION NEEDLE LENGTH

Site/Age	Needle Length
Vastus lateralis	5/8" to 1"
Deltoid (children)	5/8" to 1 1/4"
Deltoid (adults)	1" to 1 1/2"
Ventrogluteal (adults)	1 1/2"

(Adapted from Centers for Disease Control and Prevention (CDC). (2009). *The pink book*: Appendices. Epidemiology and prevention of vaccine preventable diseases. (11th ed.). Appendix D. Vaccine administration. Vaccine administration guidelines. Available www.cdc.gov/vaccines/pubs/pinkbook/pink-appendx.htm#appd. Accessed July 2, 2009; Centers for Disease Control and Prevention (CDC). (2008). Needle length and injection site of intramuscular injections. Available at www.cdc.gov/vaccines/ed/encounter08/Downloads.Table%207.pdf. Accessed June 20, 2009; Centers for Disease Control and Prevention (CDC). (2007). National immunization program. Vaccine administration. (Slide presentation). Available at www.cdc.gov/vaccines/ed/vpd2007/download/slides/admin-images.ppt. Accessed June 23, 2009; and Nicoll, L., & Hesby, A. (2002). Intramuscular injection: An integrative research review and guideline for evidence-based practice. *Applied Nursing Research*, 16(2), 149–162.)

TABLE • 5-2 INTRAMUSCULAR SITE SELECTION

	Recommended Site
Age of Patient	
Infants	Vastus lateralis
Toddlers and children	Vastus lateralis or deltoid
Adults	Ventrogluteal or deltoid
Medication Type	
Biologicals (infants and young children)	Vastus lateralis
Biologicals (older children and adults)	Deltoid
Hepatitis B/Rabies	Deltoid
Medications that are known to be irritating, viscous, or oily solutions	Ventrogluteal

(Adapted from Centers for Disease Control and Prevention (CDC). (2009). *The pink book*: Appendices. Epidemiology and prevention of vaccine preventable diseases. (11th ed.). Appendix D. Vaccine administration. Vaccine administration guidelines. Available www.cdc.gov/vaccines/pubs/pinkbook/pink-appendx.htm#appd. Accessed July 2, 2009; Centers for Disease Control and Prevention (CDC). (2008). Needle length and injection site of intramuscular injections. Available at www.cdc.gov/vaccines/ed/encounter08/Downloads.Table%207.pdf. Accessed June 20, 2009; Centers for Disease Control and Prevention (CDC). (2007). National immunization program. Vaccine administration. (Slide presentation). Available at www.cdc.gov/vaccines/ed/vpd2007/download/slides/admin-images.ppt. Accessed June 23, 2009; and Nicoll, L., & Hesby, A. (2002). Intramuscular injection: An integrative research review and guideline for evidence-based practice. *Applied Nursing Research*, 16(2), 149–162.)

TABLE • 5-3 PATIENT POSITIONING

Injection Site	Patient Position
Deltoid	Patient may sit or stand. A child may be held in an adult's lap.
Ventrogluteal	Patient may stand, sit, lie laterally, and lay supine.
Vastus lateralis	Patient may sit or lay supine. Infants and young children may lay supine or be held in an adult's lap.

(Centers for Disease Control and Prevention (CDC). (2009). The pink book: Appendices. *Epidemiology and prevention of vaccine preventable diseases*. (11th ed.). Appendix D. Vaccine administration. Vaccine administration guidelines. Available www.cedc.gov/vaccines/pubs/pinkbook/pink-appendx.htm#appd. Accessed July 2, 2009.)

Equipment

- Disposable gloves
- Additional PPE, as indicated
- Medication
- Sterile syringe and needle of appropriate size and gauge
- Antimicrobial swab
- Small gauze square
- Computer-generated Medication Administration Record (CMAR) or Medication Administration Record (MAR)

Action	Rationale
1. Gather equipment. Check each medication order against the original order in the medical record according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.
4. Move the medication cart to the outside of the patient's room or prepare for administration in the	Organization facilitates error-free administration and

medication area.	saves time.
5. Unlock the medication cart or drawer. Enter pass code and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use. Entering pass code and scanning ID allows only authorized users into the system and identifies user for documentation by the computer.
6. Prepare medications for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the *first* check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the *second* check of the label. Verify calculations with another nurse to ensure safety, if necessary.
9. If necessary, withdraw medication from an ampule or vial.	
10. When all medications for one patient have been prepared, recheck the label with the MAR before taking the medications to the patient.	This is a *third* check to ensure accuracy and to prevent errors. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
11. Lock the medication cart before leaving it.	Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use.
12. Transport medications to the patient's bedside carefully, and keep the medications in sight at all times.	Careful handling and close observation prevent accidental or deliberate disarrangement of medications.
13. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after designated time.
14. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.

15. Identify the patient. Usually, the patient should be identified using two methods. Compare information with the CMAR/MAR.	Identifying the patient ensures the right patient receives the medications and helps prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.
b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient for the second source.	This is another way to double-check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
16. Close the door to the room or pull the bedside curtain.	This provides patient privacy.
17. Complete necessary assessments before administering medications. Check the patient's allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of the medication to the patient and family.	Assessment is a prerequisite to administration of medications. Explanation provides rationale, increases knowledge, and reduces anxiety.
18. Scan the patient's bar code on the identification band, if required.	Provides an additional check to ensure that the medication is given to the right patient.
19. Put on clean gloves.	Gloves help prevent exposure to contaminants.
20. Select an appropriate administration site.	Selecting the appropriate site prevents injury.
21. Assist the patient to the appropriate position for the site chosen. Drape, as needed, to expose only the area of site being used.	Appropriate positioning for the site chosen prevents injury. Draping helps maintain the patient's privacy.
22. Identify the appropriate landmarks for the site chosen.	Good visualization is necessary to establish the correct location of the site and to avoid damage to tissues.
23. Cleanse the area around the injection site with an antimicrobial swab. Use a firm, circular motion while moving outward from the injection site. Allow area to dry.	Pathogens on the skin can be forced into the tissues by the needle. Moving from the center outward prevents contamination of the site. Allowing skin to dry prevents introducing alcohol into the tissue,

which can be irritating and uncomfortable.

24. Remove the needle cap by pulling it straight off. Hold the syringe in your dominant hand between the thumb and forefinger.

This technique lessens the risk of an accidental needlestick and also prevents inadvertently unscrewing the needle from the barrel of the syringe.

25. Displace the skin in a Z-track manner by pulling the skin down or to one side about 1 inch (2.5 cm) with your nondominant hand and hold the skin and tissue in this position.

This ensures medication does not leak back along the needle track and into the subcutaneous tissue.

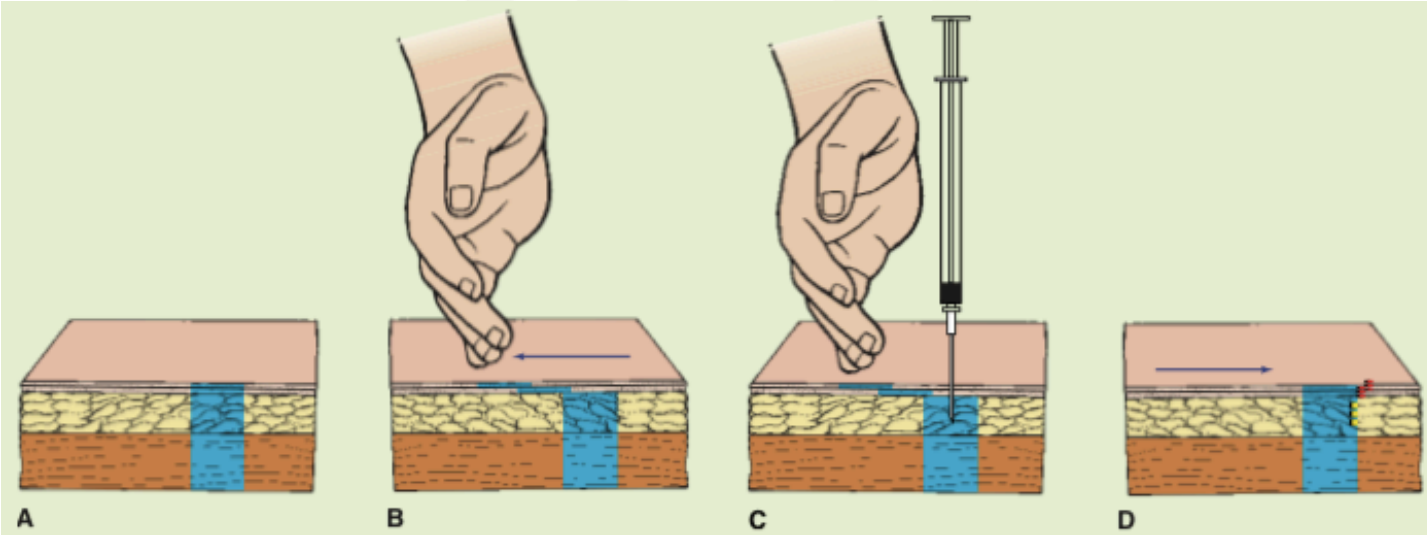

FIGURE 2. The Z-track or zigzag technique is recommended for intramuscular injections. (**A**) Normal skin and tissues. (**B**) Moving the skin to one side. (**C**) Needle is inserted at a 90-degree angle, and the nurse aspirates for blood. (**D**) Once the needle is withdrawn, displaced tissue is allowed to return to its normal position, preventing the solution from escaping from the muscle tissue.

26. Quickly dart the needle into the tissue so that the needle is perpendicular to the patient's body. This should ensure that it is given using an angle of injection between 72 and 90 degrees.

A quick injection is less painful. Inserting the needle at a 72- to 90-degree angle facilitates entry into muscle tissue.

27. As soon as the needle is in place, use the thumb and forefinger of your nondominant hand to hold the lower end of the syringe. Slide your dominant hand to the end of the plunger. Inject the solution slowly (10 sec/mL of medication).

Moving the syringe could cause damage to the tissues and inadvertent administration into incorrect area. Rapid injection of the solution creates pressure in the tissues, resulting in discomfort. An outdated practice is the inclusion of aspiration (process of pulling back on the plunger of the syringe before injection to ensure the medication is not injected into a blood vessel) has been part of this procedure in the past. According to the CDC (2009), this procedure is not

	required.
28. Once the medication has been instilled, wait 10 seconds before withdrawing the needle.	Allows medication to begin to diffuse into the surrounding muscle tissue (Nicoll & Hesby, 2002).
29. Withdraw the needle smoothly and steadily at the same angle at which it was inserted, supporting tissue around the injection site with your nondominant hand.	Slow withdrawal of the needle pulls the tissues and causes discomfort. Applying counter traction around the injection site helps to prevent pulling on the tissue as the needle is withdrawn. Removing the needle at the same angle at which it was inserted minimizes tissue damage and discomfort for the patient.
30. Apply gentle pressure at the site with a dry gauze. Do not massage the site.	Light pressure causes less trauma and irritation to the tissues. Massaging can force medication into subcutaneous tissues.
31. Do not recap the used needle. Engage the safety shield or needle guard, if present. Discard the needle and syringe in the appropriate receptacle.	Proper disposal of the needle prevents injury.
32.. Assist the patient to a position of comfort.	This provides for the well-being of the patient.
33. Remove gloves and additional PPE, if used. Per form hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.
34. Document the administration of the medication immediately after administration. See Documentation section below.	Timely documentation helps to ensure patient safety.
35. Evaluate the patient's response to medication within an appropriate time frame. Assess site, if possible, within 2 to 4 hours after administration.	The patient needs to be evaluated for therapeutic and adverse effects from the medication. Visualization of the site allows for assessment of any untoward effects.

Skill Variation Administering an Intramuscular Injection Without Using the Z-Track Technique

If the Z-Track technique is not used, stretch the skin flat between two fingers and hold it taut for needle insertion. To administer the injection:

1. Perform hand hygiene and put on PPE, as indicated.

2. Identify the patient.
3. Explain procedure to patient.
4. Select an appropriate administration site.
5. Assist the patient to the appropriate position for the site chosen. Drape, as needed, to expose only area of site to be used.
6. Put on gloves.
7. Identify the appropriate landmarks for the site chosen with your nondominant hand.
8. Clean the area around the injection site with an antimicrobial swab. Use a firm, circular motion while moving outward from the injection site. Allow area to dry.
9. Remove the needle cap by pulling it straight off. Hold the syringe in your dominant hand between the thumb and forefinger.
10. Stretch the skin flat between two fingers and hold taut for needle insertion.
11. Quickly dart the needle into the tissue so that the needle is perpendicular to the patient's body. This should ensure that it is given using an angle of injection between 72 and 90 degrees.
12. As soon as the needle is in place, use your thumb and forefinger of your nondominant hand to hold the lower end of the syringe. Slide your dominant hand to the end of the plunger.
13. Inject the solution slowly (10 sec/mL of medication).
14. Withdraw the needle smoothly and steadily at the same angle at which it was inserted, supporting tissue around the injection site with your nondominant hand.
15. Apply gentle pressure at the site with a dry gauze.
16. Do not recap the used needle. Engage the safety shield or needle guard. Discard the needle and syringe in the appropriate receptacle.
17. Assist the patient to a position of comfort.

18. Remove gloves and additional PPE, if used. Perform hand hygiene.
19. Document administration of the medication on the CMAR/MAR immediately after performing the procedure.
20. Evaluate the patient's response to medication within an appropriate time frame. Assess site, if possible, within 2 to 4 hours after administration.

Administering Medications by Intravenous Bolus or Push Through an Intravenous Infusion

A medication can be administered as an IV bolus or push. This involves a single injection of a concentrated solution directly into an IV line. Drugs given by IV push are used for intermittent dosing or to treat emergencies. The drug is administered very slowly over at least 1 minute. This can be done manually or a syringe pump may be used. Confirm exact administration times by consulting a pharmacist or drug reference.

Equipment

- Antimicrobial swab
- Watch with second hand, or stopwatch
- Clean gloves
- Additional PPE, as indicated
- Prescribed medication
- Syringe with a needleless device or 23- to 25-gauge, 1-inch needle (follow facility policy)
- Syringe pump, if necessary
- Computer-generated Medication Administration Record (CMAR) or Medication Administration Record (MAR)

Action	Rationale
1. Gather equipment. Check medication order against the original order in the medical record, according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies. Verify the compatibility of the medication and IV fluid. Check a drug resource to clarify whether the medication needs to be diluted before administration. Check the infusion rate.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility. Compatibility of medication and solution prevents complications. Delivers the correct dose of medication as prescribed.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.
4. Move the medication cart to the outside of the patient's room or prepare for administration in the medication area.	Organization facilitates error-free administration and saves time.

5. Unlock the medication cart or drawer. Enter pass code and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use. Entering pass code and scanning ID allows only authorized users into the system and identifies user for documentation by the computer.
6. Prepare medication for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the *first* check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the *second* check of the label. Verify calculations with another nurse to ensure safety, if necessary.
9. If necessary, withdraw medication from an ampule or vial.	
10. Recheck the label with the MAR before taking it to the patient.	This is a *third* check to ensure accuracy and to prevent errors. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
11. Lock the medication cart before leaving it.	Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use.
12. Transport medications and equipment to the patient's bedside carefully, and keep the medications in sight at all times.	Careful handling and close observation prevent accidental or deliberate disarrangement of medications. Having equipment available saves time and facilitates performance of the task.
13. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after designated time.

14. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
15. Identify the patient. Usually, the patient should be identified using two methods. Compare information with the CMAR/MAR.	Identifying the patient ensures the right patient receives the medications and helps prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.
b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient for the second source.	This is another way to double-check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
16. Close the door to the room or pull the bedside curtain.	This provides patient privacy.
17. Complete necessary assessments before administering medications. Check the patient's allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of the medication to the patient and family.	Assessment is a prerequisite to administration of medications. Explanation provides rationale, increases knowledge, and reduces anxiety.
18. Scan the patient's bar code on the identification band, if required.	Provides an additional check to ensure that the medication is given to the right patient.
19. Assess IV site for presence of inflammation or infiltration.	IV medication must be given directly into a vein for safe administration.
20. If IV infusion is being administered via an infusion pump, pause the pump.	Pausing prevents infusion of fluid during bolus administration and activation of pump occlusion alarms.
21. Put on clean gloves.	Gloves prevent contact with blood and body fluids.
22. Select injection port on tubing that is closest to venipuncture site. Clean port with antimicrobial swab.	Using port closest to needle insertion site minimizes dilution of medication. Cleaning deters entry of microorganisms when port is

	punctured.
23. Uncap syringe. Steady port with your nondominant hand while inserting syringe into center of port.	This supports the injection port and lessens the risk for accidentally dislodging the IV or entering the port incorrectly.
24. Move your nondominant hand to the section of IV tubing just above the injection port. Fold the tubing between your fingers.	This temporarily stops flow of gravity IV infusion and prevents medication from backing up tubing.
25. Pull back slightly on plunger just until blood appears in tubing.	This ensures injection of medication into the bloodstream.
26. Inject the medication at the recommended rate	This delivers correct amount of medication at proper interval according to manufacturer's directions.
27. Release the tubing. Remove the syringe. Do not recap the used needle, if used. Engage the safety shield or needle guard, if present. Release the tubing and allow the IV fluid to flow. Discard the needle and syringe in the appropriate receptacle.	Proper disposal of the needle prevents injury.
28. Check IV fluid infusion rate. Restart infusion pump, if appropriate.	Injection of bolus may alter rate of fluid infusion, if infusing by gravity.
29. Remove gloves and additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.
30. Document the administration of the medication immediately after administration.	Timely documentation helps to ensure patient safety.
31. Evaluate the patient's response to medication within appropriate time frame.	The patient needs to be evaluated for therapeutic and adverse effects from the medication.

Instilling Eye Drops

Eye drops are instilled for their local effects, such as for pupil dilation or constriction when examining the eye, for infection treatment, or for controlling intraocular pressure. The type and amount of solution depend on the purpose of the instillation.

The eye is a delicate organ, highly susceptible to infection and injury. Although the eye is never free of microorganisms, the secretions of the conjunctiva protect against many pathogens. For maximal safety for the patient, the equipment, solutions, and ointments introduced into the conjunctival sac should be sterile. If this is not possible, follow careful guidelines for medical asepsis.

Equipment

- Gloves
- Additional PPE, as indicated
- Medication
- Tissues
- Normal saline solution
- Washcloth, cotton balls, or gauze squares
- Computer-generated Medication Administration Record (CMAR) or Medication Amdinistration Record (MAR)

Action	Rationale
1. Gather equipment. Check medication order against the original order in the medical record, according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies. Verify the compatibility of the medication and IV fluid. Check a drug resource to clarify whether the medication needs to be diluted before administration. Check the infusion rate.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility. Compatibility of medication and solution prevents complications. Delivers the correct dose of medication as prescribed.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.
4. Move the medication cart to the outside of the patient's	Organization facilitates error-free

room or prepare for administration in the medication area.	administration and saves time.
5. Unlock the medication cart or drawer. Enter pass code and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use. Entering pass code and scanning ID allows only authorized users into the system and identifies user for documentation by the computer.
6. Prepare medication for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the *first* check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the *second* check of the label. Verify calculations with another nurse to ensure safety, if necessary.
9. Recheck the label with the MAR before taking it to the patient.	This is a *third* check to ensure accuracy and to prevent errors. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
10. Lock the medication cart before leaving it.	Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use.
11. Transport medications and equipment to the patient's bedside carefully, and keep the medications in sight at all times.	Careful handling and close observation prevent accidental or deliberate disarrangement of medications. Having equipment available saves time and facilitates performance of the task.
12. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after designated time.

13. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
14. Identify the patient. Usually, the patient should be identified using two methods. Compare information with the CMAR/MAR.	Identifying the patient ensures the right patient receives the medications and helps prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.
b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient for the second source.	This is another way to double-check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
15. Close the door to the room or pull the bedside curtain.	This provides patient privacy.
16. Complete necessary assessments before administering medications. Check the patient's allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of the medication to the patient and family.	Assessment is a prerequisite to administration of medications. Explanation provides rationale, increases knowledge, and reduces anxiety.
17. Scan the patient's bar code on the identification band, if required.	Provides an additional check to ensure that the medication is given to the right patient.
18. Put on clean gloves.	Gloves prevent contact with blood and body fluids.
19. Offer tissue to patient.	Solution and tears may spill from the eye during the procedure.
20. Cleanse the eyelids or eyelashes of any drainage with a washcloth, cotton balls, or gauze squares moistened with normal saline solution. Use each area of the cleaning surface once, moving from the inner toward the outer canthus.	Debris can be carried into the eye when the conjunctival sac is exposed. Using each area of the gauze once and moving from the inner canthus to the outer canthus prevents carrying debris to the lacrimal ducts.
21. Tilt the patient's head back slightly if sitting, or place the patient's head over a pillow if lying down. The head may be	Tilting patient's head back slightly makes it easier to reach the conjunctival sac. This

turned slightly to the affected side to prevent solution or tears from flowing toward the opposite eye.	should be avoided if the patient has a cervical spine injury. Turning the head to the affected side helps to prevent solution or tears from flowing toward the opporiste eye.
22. Remove the cap from the medication bottle, being careful not to touch the inner side of the cap.	Touching the inner side of the cap may contaminate the bottle of medication.
23. Invert the monodrip plastic container that is commonly used to instill eye drops. Have patient look up and focus on something on the ceiling.	By having the patient look up and focus on something else, the procedure is less traumatic and keeps the eye still.
24. Place thumb or two fingers near margin of lower eyelid immediately below eyelashes, and exert pressure downward over bony prominence of cheek. Lower conjunctival sac is exposed as lower lid is pulled down.	The eye drop should be placed in the conjunctival sac, not directly on the eyeball.
25. Hold dropper close to eye, but avoid touching eyelids or lashes. Squeeze container and allow prescribed number of drops to fall in lower conjunctival sac.	Touching the eye, eyelids, or lashes can contaminate the medication in the bottle; startle the patient, causing blinking, or injure the eye. Do not allow medication to fall onto cornea. This may injure the cornea or cause the patient to have an unpleasant sensation.
26. Release lower lid after eye drops are instilled. Ask patient to close eyes gently.	This allows the medication to be distributed over the entire eye.
27. Apply gentle pressure over inner canthus to prevemt eye drops from flowing into tear duct.	This minimizes the risk of systemic effects from the medication.
28. Instruct patient not to rub affected eye.	This prevents injury and irritation to eye.
29. Remove gloves and additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.
30. Document the administration of the medication immediately after administration.	Timely documentation helps to ensure patient safety.
31. Evaluate the patient's response to medication within appropriate time frame.	The patient needs to be evaluated for therapeutic and adverse effects from the medication.

Instilling Ear Drops

Drugs are instilled into the auditory canal for their local effect. They are used to soften wax, relieve pain, apply local anesthesia, and treat infections.

The tympanic membrane separates the external ear from the middle ear. Normally, it is intact and closes the entrance to the middle ear completely. If it is ruptured or has been opened by surgical intervention, the middle ear and the inner ear have a direct passage to the external ear. When this occurs, perform instillations with the greatest of care to prevent forcing materials from the outer ear into the middle ear and the inner ear. Use sterile technique to prevent infection.

Equipment

- Medication (warmed to 37^0C)
- Dropper
- Tissue
- Cotton ball (optional)
- Gloves
- Additional PPE, as indicated
- Washcloth (optional)
- Normal saline solution
- Computer-generated Medication Administration Record (CMAR) or Medication Administration Record (MAR)

Action	Rationale
1. Gather equipment. Check medication order against the original order in the medical record, according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies. Verify the compatibility of the medication and IV fluid. Check a drug resource to clarify whether the medication needs to be diluted before administration. Check the infusion rate.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility. Compatibility of medication and solution prevents complications. Delivers the correct dose of medication as prescribed.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of

	microorganisms.
4. Move the medication cart to the outside of the patient's room or prepare for administration in the medication area.	Organization facilitates error-free administration and saves time.
5. Unlock the medication cart or drawer. Enter pass code and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use. Entering pass code and scanning ID allows only authorized users into the system and identifies user for documentation by the computer.
6. Prepare medication for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the *first* check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the *second* check of the label. Verify calculations with another nurse to ensure safety, if necessary.
9. Recheck the label with the MAR before taking it to the patient.	This is a *third* check to ensure accuracy and to prevent errors. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
10. Lock the medication cart before leaving it.	Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use.
11. Transport medications and equipment to the patient's bedside carefully, and keep the medications in sight at all times.	Careful handling and close observation prevent accidental or deliberate disarrangement of medications. Having equipment available saves time and facilitates performance of the task.
12. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after

	designated time.
13. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
14. Identify the patient. Usually, the patient should be identified using two methods. Compare information with the CMAR/MAR.	Identifying the patient ensures the right patient receives the medications and helps prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.
b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient for the second source.	This is another way to double-check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
15. Close the door to the room or pull the bedside curtain.	This provides patient privacy.
16. Complete necessary assessments before administering medications. Check the patient's allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of the medication to the patient and family.	Assessment is a prerequisite to administration of medications. Explanation provides rationale, increases knowledge, and reduces anxiety.
17. Scan the patient's bar code on the identification band, if required.	Provides an additional check to ensure that the medication is given to the right patient.
18. Put on clean gloves.	Gloves prevent contact with blood and body fluids.
19. Cleanse external ear of any drainage with cotton ball or washcloth moistened with normal saline.	Debris and drainage may prevemt some of the medication from entering the ear canal.
20. Place patient on his or her unaffected side in bed, or, if ambulatory, have patient sit with head well tilted to the side so that affected ear is uppermost.	This positioning prevents the drops from escaping from the ear.
21. Draw up the amount of solution needed in the dropper. Do not return excess medication to stock bottle. A prepackaged,	Risk for contamination is increased when

monodrip plastic container may also be used.	medication is returned to the stock botlle.
22. Straighten auditory canal by pulling cartilaginous portion of pinna down and back for 3 years old below / pinna up and back for 3 years old above.	Pulling on the pinna as described helps to straighten the canal properly for ear drop instillation.
23. Hold dropper in the ear with its tip above the audiroty canal. Do not touch the dropper to the ear. For an infant or an irrational or confused patient, protect the dropper with a piece of soft tubing to help prevemt injury to the ear.	By holding the dropper in the ear, most of the medication will enter the ear canal. Touching the dropper to the ear contaminates the dropper and medication. The hard tip of the dropper can damage the tympanic membrane if it is jabbed into the ear.
24. Allow drops to fall on the side of the canal.	It is uncomfortable for the patient if the drops fall directly onto the tympanic membrane.
25. Release pinna after instilling drops, and have patient maintain the position to prevemt escape of medication.	Medication should remain in ear canal for at least 5 minutes.
26. Gently press on the tragus a few times.	Pressing on the tragus causes medication from the canal to move toward the tympanic membrane.
27. If ordered, lossely insert a cotton ball into the ear canal.	A cotton ball can help prevemt medication from leaking out of ear canal.
28. Remove gloves and additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.
29. Document the administration of the medication immediately after administration.	Timely documentation helps to ensure patient safety.
30. Evaluate the patient's response to medication within appropriate time frame.	The patient needs to be evaluated for therapeutic and adverse effects from the medication.

Instilling Nose Drops

Nasal instillations are used to treat allergies, sinus infections, and nasal congestion. Medications with a systemic effect, such as vasopressin, may also be prepared as a nasal instillation. The nose is normally not a sterile cavity, but because of its connection with the sinuses, it is important to observe medical asepsis carefully when using nasal instillations.

Equipment

- Medication
- Dropper, if not part of medication container
- Tissue
- Gloves
- Additional PPE, as indicated
- Computer-generated Medication Administration Record (CMAR) or Medication Administration Record (MAR)

Action	Rationale
1. Gather equipment. Check medication order against the original order in the medical record, according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies. Verify the compatibility of the medication and IV fluid. Check a drug resource to clarify whether the medication needs to be diluted before administration. Check the infusion rate.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility. Compatibility of medication and solution prevents complications. Delivers the correct dose of medication as prescribed.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.
4. Move the medication cart to the outside of the patient's room or prepare for administration in the medication area.	Organization facilitates error-free administration and saves time.
5. Unlock the medication cart or drawer. Enter pass code and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in

	use. Entering pass code and scanning ID allows only authorized users into the system and identifies user for documentation by the computer.
6. Prepare medication for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the *first* check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the *second* check of the label. Verify calculations with another nurse to ensure safety, if necessary.
9. Recheck the label with the MAR before taking it to the patient.	This is a *third* check to ensure accuracy and to prevent errors. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
10. Lock the medication cart before leaving it.	Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use.
11. Transport medications and equipment to the patient's bedside carefully, and keep the medications in sight at all times.	Careful handling and close observation prevent accidental or deliberate disarrangement of medications. Having equipment available saves time and facilitates performance of the task.
12. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after designated time.
13. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
14. Identify the patient. Usually, the patient should be identified using two methods. Compare information with the	Identifying the patient ensures the right patient receives the medications and helps

CMAR/MAR.	prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.
b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient for the second source.	This is another way to double-check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
15. Close the door to the room or pull the bedside curtain.	This provides patient privacy.
16. Complete necessary assessments before administering medications. Check the patient's allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of the medication to the patient and family.	Assessment is a prerequisite to administration of medications. Explanation provides rationale, increases knowledge, and reduces anxiety.
17. Scan the patient's bar code on the identification band, if required.	Provides an additional check to ensure that the medication is given to the right patient.
18. Put on clean gloves.	Gloves prevent contact with blood and body fluids.
19. Provide patient with paper tissues and ask patient to blow his or her nose.	Blowing the nose clears the nasal mucosa prior to medication administration.
20. Have patient sit up with head tilted well back. If patient is lying down, tilt head back over a pillow.	These positions allow the solution to flow well back into the nares. Do not tilt the head if patient has a cervical spine injury.
21. Draw sufficient solution into dropper for both nares. Do not return excess solution to a stock bottle.	Returning solution to a stock bottle increases the risk for contamination of the stock bottle.
22. Ask the patient to breathe through the mouth. Hold tip of nose up and place dropper just above naris, about 1/3 inch. Instill the prescribed number of drops in one naris and then into the other. Protect dropper with a piece of soft tubing if patient is an infant or young child. Avoid touching naris with	Breathing through the mouth helps prevent aspiration of solution. The soft tubing will protect the patient'snares from injury during administration of medication. Touching the naris may cause the patient to sneeze and

dropper.	will contaminate the dropper.
23. Have patient remain in position with head tilted back for a few minutes.	Tilting the head back prevents the scape of the medication.
24. Remove gloves and additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.
25. Document the administration of the medication immediately after administration.	Timely documentation helps to ensure patient safety.
26. Evaluate the patient's response to medication within appropriate time frame.	The patient needs to be evaluated for therapeutic and adverse effects from the medication.

Administering Rectal Suppository

Rectal suppositories are used primarily for their local action, such as laxatives and fecal softeners. Systemic effects are also achieved with rectal suppositories. It is important to ensure the supposi- tory is placed past the internal anal sphincter and against the rectal mucosa.

Equipment

- Suppository
- Water-soluble lubricant
- Clean gloves
- Additional PPE, as indicated
- Computer-generated Medication Administration Record (CMAR) or Medication Administration Record (MAR)

Action	Rationale
1. Gather equipment. Check medication order against the original order in the medical record, according to facility policy. Clarify any inconsistencies. Check the patient's chart for allergies. Verify the compatibility of the medication and IV fluid. Check a drug resource to clarify whether the medication needs to be diluted before administration. Check the infusion rate.	This comparison helps to identify errors that may have occurred when orders were transcribed. The primary care provider's order is the legal record of medication orders for each facility. Compatibility of medication and solution prevents complications. Delivers the correct dose of medication as prescribed.
2. Know the actions, special nursing considerations, safe dose ranges, purpose of administration, and adverse effects of the medications to be administered. Consider the appropriateness of the medication for this patient.	This knowledge aids the nurse in evaluating the therapeutic effect of the medication in relation to the patient's disorder and can also be used to educate the patient about the medication.
3. Perform hand hygiene.	Hand hygiene prevents the spread of microorganisms.
4. Move the medication cart to the outside of the patient's room or prepare for administration in the medication area.	Organization facilitates error-free administration and saves time.
5. Unlock the medication cart or drawer. Enter pass code and scan employee identification, if required.	Locking the cart or drawer safeguards each patient's medication supply. Hospital accrediting organizations require

	medication carts to be locked when not in use. Entering pass code and scanning ID allows only authorized users into the system and identifies user for documentation by the computer.
6. Prepare medication for one patient at a time.	This prevents errors in medication administration.
7. Read the CMAR/MAR and select the proper medication from the patient's medication drawer or unit stock.	This is the *first* check of the label.
8. Compare the label with the CMAR/MAR. Check expiration dates and perform calculations, if necessary. Scan the bar code on the package, if required.	This is the *second* check of the label. Verify calculations with another nurse to ensure safety, if necessary.
9. Recheck the label with the MAR before taking it to the patient.	This is a *third* check to ensure accuracy and to prevent errors. Some facilities require the third check to occur at the bedside, after identifying the patient and before administration.
10. Lock the medication cart before leaving it.	Locking the cart or drawer safeguards the patient's medication supply. Hospital accrediting organizations require medication carts to be locked when not in use.
11. Transport medications and equipment to the patient's bedside carefully, and keep the medications in sight at all times.	Careful handling and close observation prevent accidental or deliberate disarrangement of medications. Having equipment available saves time and facilitates performance of the task.
12. Ensure that the patient receives the medications at the correct time.	Check agency policy, which may allow for administration within a period of 30 minutes before or 30 minutes after designated time.
13. Perform hand hygiene and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
14. Identify the patient. Usually, the patient should be identified using two methods. Compare information with the	Identifying the patient ensures the right patient receives the medications and helps

CMAR/MAR.	prevent errors.
a. Check the name and identification number on the patient's identification band.	This is the most reliable method. Replace the identification band if it is missing or inaccurate in any way.
b. Ask the patient to state his or her name and birth date, based on facility policy.	This requires a response from the patient, but illness and strange surroundings often cause patients to be confused.
c. If the patient cannot identify him- or herself, verify the patient's identification with a staff member who knows the patient for the second source.	This is another way to double-check identity. Do not use the name on the door or over the bed, because these signs may be inaccurate.
15. Close the door to the room or pull the bedside curtain.	This provides patient privacy.
16. Complete necessary assessments before administering medications. Check the patient's allergy bracelet or ask the patient or family about allergies. Explain the purpose and action of the medication to the patient and family.	Assessment is a prerequisite to administration of medications. Explanation provides rationale, increases knowledge, and reduces anxiety.
17. Scan the patient's bar code on the identification band, if required.	Provides an additional check to ensure that the medication is given to the right patient.
18. Put on clean gloves.	Gloves prevent contact with blood and body fluids.
19. Assist the patient to his or her left side in a Sim's position. Drape accordingly to only expose the buttocks.	Positioning allows for easy access to anal area. Left side decreses chance of expulsion of the suppository. Proper draping maintains privacy.
20. Remove the suppository from its wrapper. Apply lubricant to the rounded end. Lubricate the index finger of your dominant hand.	Lubricant reduces friction on administration and increases patient comfort.
21. Separate the buttocks with your nondominant hand and instruct the patient to breathe slowly and deeply through his or her mouth while the suppository is being inserted.	Slow, deep breaths help to relax the anal sphincter and reduce discomfort.
22. Using your index finger, insert the suppository, round end first, along the rectal wall. Insert about 3 to 4 inches.	Suppository must make contact with the rectal mucosa for absorption to occur.
23. Use toilet tissue to clean any stool or lubricant from	Prevents skins irritation. Prevents accidental

around the anus. Release the buttocks. Encourage the patient to remain on his or her side for at least 5 minutes and retain the suppository for the appropriate amount of time for the specific medication.	expulsion of suppository and ensures absorption of medication.
24. Remove gloves and additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.
25. Document the administration of the medication immediately after administration.	Timely documentation helps to ensure patient safety.
26. Evaluate the patient's response to medication within appropriate time frame.	The patient needs to be evaluated for therapeutic and adverse effects from the medication.

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8. Oxygenation

Administering Oxygen by Nasal Cannula

A variety of devices are available for delivering oxygen to the patient. Each has a specific function and oxygen concentration. Device selection is based on the patient's condition and oxygen needs. A nasal cannula, also called nasal prongs, is the most commonly used oxygen delivery device. The cannula is a disposable plastic device with two protruding prongs for insertion into the nostrils. The cannula connects to an oxygen source with a flow meter and, many times, a humidifier. It is com- monly used because the cannula does not impede eating or speaking and is used easily in the home. Disadvantages of this system are that it can be dislodged easily and can cause dryness of the nasal mucosa. A nasal cannula is used to deliver from 1 L/minute to 6 L/minute of oxygen. Table 14-1 compares amounts of delivered oxygen for these flow rates.

TABLE • 14-1 OXYGEN DELIVERY SYSTEMS

Method	Amount Delivered FIO_2 (Fraction Inspired Oxygen)	Priority Nursing Interventions
Nasal cannula	*Low Flow* 1 L/min = 24% 2 L/min = 28% 3 L/min = 32% 4 L/min = 36% 5 L/min = 40% 6 L/min = 44%	Check frequently that both prongs are in patient's nares. May be limited to no more than 2–3 L/min to patient with chronic lung disease.
Simple mask	*Low Flow* 6–10 L/min = 35% to 60% (5 L/min is minimum setting)	Monitor patient frequently to check placement of the mask. Support patient if claustrophobia is a concern. Secure physician's order to replace mask with nasal cannula during meal time.
Partial rebreather mask	*Low Flow* 6–15 L/min = 70% to 90%	Set flow rate so that mask remains two-thirds full during inspiration. Keep reservoir bag free of twists or kinks.
Nonrebreather mask	*Low Flow* 6–15 L/min = 60% to 100%	Maintain flow rate so reservoir bag collapses only slightly during inspiration. Check that valves and rubber flaps are functioning properly (open during expiration and closed during inhalation). Monitor SaO_2 with pulse oximeter.
Venturi mask	*High Flow* 4–10 L/min = 24% to 55%	Requires careful monitoring to verify FIO_2 at flow rate ordered. Check that air intake valves are not blocked.

Equipment

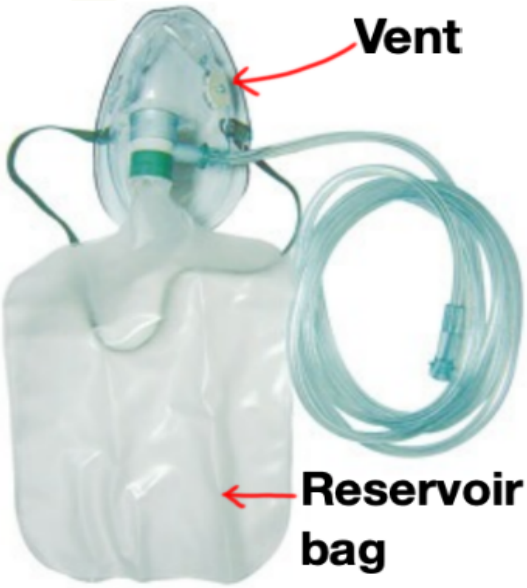
- Flow meter connected to oxygen supply
- Humidifier with sterile, distilled water (optional for low-flow system)
- Nasal cannula and tubing
- Gauze to pad tubing over ears (optional)
- PPE, as indicated

Action	Rationale
1. Bring the necessary equipment to the bedside stand or overbed table.	Bringing everything to the bedside conserves time and energy. Arranging items nearby is convenient, saves time, and avoids unnecessary stretching and twisting of muscles on the part of the nurse.
2. Perform handhygiene and put on PPE, if indicated.	Hand hygene and PPE prevemt the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the righ patient receives the intervention and helps prevent errors.
4. Close curtains around bed and close the door to the room, if possible.	This ensures patient's privacy.
5. Explain what you are going to do and the reason for doing it to the patient and parents/ guardians. Review safety precautions necessary when oxygen is in use. Place "No Smoking" signs in appropriate areas.	Explanation relieves anxiety and facilitates cooperation. Oxygen supports combustion; a small spark could cause a fire.
6. Connect nasal cannula to oxygen setup with humidification, if one is in use. Adjust flow rate as ordered. Check that oxygen is flowing out of prongs.	Oxgen forced through a water reservoir is humidifies before it is delivered to the patient, thus preventing

	dehydration of the mucous membranes. Low-flow oxygen does not require humidification.
7. Place prongs in patient's nostrils. Place tubing over and behind each ear with adjuster comfortably under chin. Alternateky, the tubing may be placed around the patient's head, with the adjuster at the back or base of the head. Place gauze pads at ear beneath the tubing, as necessary.	Correct placement of the prongs and fastener facilitates oxygen administration and patient comfort. Pads reduce irritation and pressure and protect the skin.
8. Adjust the fit of the cannula, as necessary. Tubing should be snug but not tight against the skin.	Proper adjustment maintains the prongs in the patient's nose. Excessive pressure from tubing could cause irritation and pressure to the skin.
9. Encourage patients to breathe through th nose, with the mouth closed.	Nose breathing provides for optimal delivery of oxygen to patient. The percentage of oxygen delivered can be reduced in patients who breathe through the mouth.
10. Reassess patient's respiratory status, including respiratory rate, effort, and lung sounds. Note any signs of respiratory distress, such as tachypnea, nasal flaring, use of accessory muscles, or dypnea.	This assess the effectiveness of oxygen therapy.
11. Remove PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other itens. Hand hygiene prevents the spread of microorganisms.
12. Put on clean gloves. Remove and clean the cannula and assess nares at least every 8 hours, or according to agency recommendations. Check nares for evidence of irritation or bleeding.	The continued presense of the cannula causes irritation and dryness of the mucous membranes.

Administering Oxygen by Mask

When a patient requires a higher concentration of oxygen than a nasal cannula can deliver (6 L or 44% oxygen concentration), use an oxygen mask. Fit the mask carefully to the patient's face to avoid leakage of oxygen. The mask should be comfortably snug, but not tight against the face. Disposable and reusable face masks are available. The most commonly used types of masks are the simple facemask, the partial rebreather mask, the nonrebreather mask, and the Venturi mask.



Equipment

- Flow meter connected to oxygen supply
- Humidifier with sterile, distilled water (optional for low-flow system)
- Face mask, as specified by physician
- Gauze to pad elastic band (optional)
- PPE, as indicated

Action	Rationale
1. Bring the necessary equipment to the bedside stand or overbed table.	Bringing everything to the bedside conserves time and energy. Arranging items nearby is convenient, saves time, and avoids unnecessary stretching and twisting of muscles on the part of the nurse.

2. Perform handhygiene and put on PPE, if indicated.	Hand hygene and PPE prevemt the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the righ patient receives the intervention and helps prevent errors.
4. Close curtains around bed and close the door to the room, if possible.	This ensures patient's privacy.
5. Explain what you are going to do and the reason for doing it to the patient and parents/ guardians. Review safety precautions necessary when oxygen is in use. Place "No Smoking" signs in appropriate areas.	Explanation relieves anxiety and facilitates cooperation. Oxygen supports combustion; a small spark could cause a fire.
6. Attach the face mask to oxygen source (with humification, if appropriate, for the specific mask). Start the flow of oxygen at the specified rate. For a mask with reservoir, be sure to allow oxygen to fill the bag before proceeding to the next step.	Oxygen forced through a water reservoir is humidified before it is delivered to the patient, thus preventing dehydration of the mucous membranes. A reservoir bag must be inflated with oxygen because the bag is the oxygen supply source for the patient.
7. Position face mask over the patient's nose and mouth. Adjust the elastic strap so that the mask fits snugly but comfortably on the face. Adjust the flow rate to the prescribed rate.	A loose or poorly fitting mask will result in oxygen loss and decreased therapeutic value. Masks may cause a feeling of suffocation, and the patient needs frequent attention and reassurance.
8. If the patient reports irritation or redness is noted, use gauze pads under the elastic strap at pressure points to reduce irritation to the ear and scalp.	Pads reduce irritation and pressure and protect the skin.
9. Reassess patient's respiratory status, including respiratory rate, effort, and lung sounds. Note any signs of respiratory distress, such as tachypnea, nasal flaring, use of accessory muscles, or dypnea.	This helps assess the effectiveness of oxygen therapy.
11. Remove PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other itens. Hand hygiene prevents the spread of microorganisms.
12. Put on clean gloves. Remove the mask and dry the skin every 2 to 3 hours if the oxygen is running continuously. Do not use powder around the mask.	The tight-fitting mask and moisture from condensation can irritate the skin on the face. There is a danger of inhaling powder if it is placed on the mask.

Skill Variation Using an Oxygen Hood

Oxygen hoods are generally used to deliver oxygen to infants. They can supply an oxygen concentration up to 80% to 90%. Use of oxygen hoods enable the oxygen percentage to be measured more accurately and make appropriate humidification possible (Pease, 2006). The oxygen hood is placed over the infant's head and shoulders, and allows easy access to the chest and lower body. The hoods are made of hard plastic or vinyl with a metal frame. Assessment of an infant should include assessment of skin color. A pale or cyanotic patient may not be receiving sufficient oxygen. Assessment should also include assessing the patient for any signs of respiratory distress, such as nasal flaring, grunting, or retractions; oxygen-depleted patients often exhibit these signs. Additional equipment required includes the oxygen hood, oxygen analyzer, and a humidification device.

1. Bring necessary equipment to the bedside stand or overbed table.

2. Perform hand hygiene and put on PPE, if indicated.

3. Identify the patient.

4. Close curtains around bed and close the door to the room, if possible.
5. Explain what you are going to do and the reason for doing it to the patient and parents/guardians. Review safety precautions necessary when oxygen is in use.
6. Calibrate the oxygen analyzer according to manufacturer's directions.
7. Place hood on crib. Connect humidifier to oxygen source in the wall. Connect the oxygen tubing to the hood. Adjust flow rate as ordered by physician. Check that oxygen is flowing into the hood.
8. Turn analyzer on. **Place oxygen analyzer probe in hood.**
9. Adjust oxygen flow, as necessary, based on sensor readings. Once oxygen levels reach the prescribed amount, place hood over patient's head (Figure A). The hood should not rub against the infant's neck, chin, or shoulder.

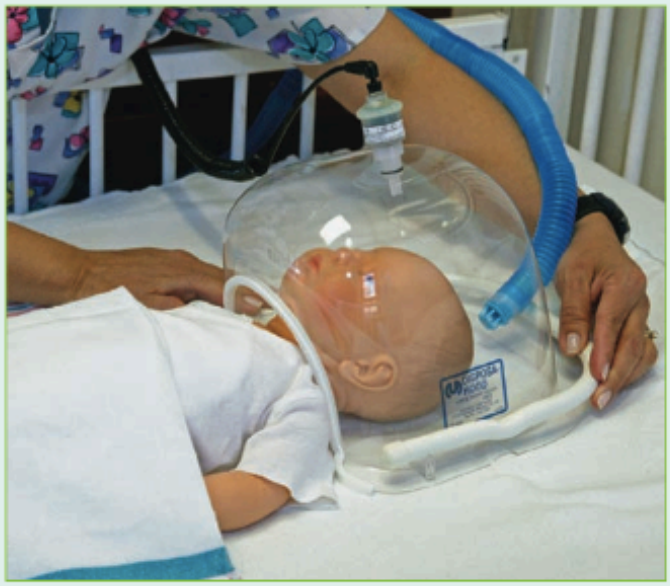


FIGURE A. Placing oxygen hood over infant.

10. If using the soft vinyl hood, roll small blankets or towels and place around edges where the hood meets crib (if needed) to keep oxygen concentration at desired level. **Do not block hole in top of hood if present. If using a vinyl hood, the vent hole covering may need to be removed.**
11. Instruct family members not to raise edges of the hood.
12. Reassess patient's respiratory status, including respiratory rate, effort, oxygen saturation, and lung sounds. Note any signs of respiratory distress, such as tachypnea, nasal flaring, grunting, retractions, or dyspnea.

13. Remove PPE, if used. Perform hand hygiene.
14. Frequently check bedding and patient's head for moisture. Change linen and dry the patient's skin, as needed, to keep the patient dry.
15. Monitor the patient's body temperature at regular intervals.

Using an Oxygen Tent

Oxygen tents are often used in children who will not leave a face mask or nasal cannula in place. The oxygen tent gives the patient freedom to move in the bed or crib while humidified oxygen is being delivered; however, it is difficult to keep the tent closed, because the child may want contact with his or her parents. It is also difficult to maintain a consistent level of oxygen and to deliver oxygen at a rate higher than 30% to 50%. Frequent assessment of the child's pajamas and bedding is necessary because the humidification quickly creates moisture, leading to damp clothing and linens, and, possibly, hypothermia.

Equipment

- Oxygen source
- Oxygen tent
- Humidifier compatible with tent
- Oxygen analyzer
- Small blankets for blanket rolls
- PPE, as indicated

Action	Rationale
1. Bring the necessary equipment to the bedside stand or overbed table.	Bringing everything to the bedside conserves time and energy. Arranging items nearby is convenient, saves time, and avoids unnecessary stretching and twisting of muscles on the part of the nurse.
2. Perform handhygiene and put on PPE, if indicated.	Hand hygene and PPE prevemt the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the righ patient receives the intervention and helps prevent errors.
4. Close curtains around bed and close the door to the room, if possible.	This ensures patient's privacy.
5. Explain what you are going to do and the reason for doing it to the patient and parents/ guardians. Review safety precautions necessary when oxygen is in use. Place "No Smoking" signs in appropriate areas.	Explanation relieves anxiety and facilitates cooperation. Oxygen supports combustion; a small spark could cause a fire.
6. Calibrate the oxygen analyzer according to manufacturer's directions.	Ensures accurate readings and appropriate adjustments to therapy.
7. Place tent over crib or bed. Connect the humidifier to the oxygen source in the wall and connect the tent tubing to the humidifier. Adjust	Oxygen forced through a water reservoir is humidified before it is delivered to the patient, thus preventing dehydration of the mucous membranes.

flow rate as ordered by physician. Check that oxygen is flowing into tent.

8. Turn analyzer on. Place oxygen analyzer probe in tent, out of patient's reach.

The analyzer will give an accurate reading of the concentration of oxygen in the crib or bed.

9. Adjust oxygen as necessary, based on sensor readings. Once oxygen levels reach the prescribed amount, place patient in the tent.

Patient will receive oxygen once placed in the tent

FIGURE 1. Adjusting oxygen flow.

FIGURE 2. Placing patient in the tent.

10. Roll small blankets like a jelly roll and tuck edges under blanket rolls, as necessary.

The blanket helps keep the edges of the tent flap form coming up and letting oxygen out.

11. Encourage patient and family members to keep tent flap closed.	Every time the tent flap is opened, oxygen is released.
12. Reassess patient's respiratory status, including respiratory rate, effort, and lung sounds. Note any signs of respiratory distress, such as tachypne, nasl flaring, use of accessory muscles, grunting, retractions, or dyspnea.	This assess the effectiveness of oxygen therapy.
13. Remove PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other itens. Hand hygiene prevents the spread of microorganisms.
14. Frequently check bedding and patient's pajamas for moisture. Change as needed to keep the patient dry.	The large amount of humidification delivered in an oxygen tent quickly makes cloth moist, which would be uncomfortable for the patient and may affect temperature regulation.

Suctioning the Nasopharyngeal and Oropharyngeal Airways

Suctioning of the pharynx is indicated to maintain a patent airway and to remove saliva, pulmonary secretions, blood, vomitus, or foreign material from the pharynx. Suctioning helps a patient who cannot successfully clear his or her airway by coughing and expectorating. When performing suc- tioning, position yourself on the appropriate side of the patient. If you are right-handed, stand on the patient's right side; if left-handed, stand on the patient's left side. This allows for comfortable use of the dominant hand to manipulate the suction catheter.

Suction Catheter Sizes for Infants and Children

Table 2-7 SUCTION CATHETER SIZES FOR INFANTS AND CHILDREN

Age	Suction Catheter Size (French)
Up to 1 Year	8
2 to 6 Years	10
7 to 15 Years	12
16 Years	12 to 14

Equipment

- Portable or wall suction unit with tubing
- A commercially prepared suction kit with an appropriate size catheter or
- Sterile suction catheter with Y-port in the appropriate size
- Sterile disposable container
- Sterile gloves
- Sterile water or saline
- Towel or waterproof pad
- Goggles and mask or face shield
- Disposable gloves
- Watr-soluble lubricant
- Additional PPE, as indicated

Action	Rationale
1. Bring necessary equipment to the bedside stand or overbed table.	Bringing everything to the bedside conserves time and energy. Arranging items nearby is convenient, saves time, and avoids unnecessary stretching and twisting of muscles on the part of the nurse.
2. Perform hand hygiee and put on PPE, if indicated.	Hand hygiene and PPE prevent the spread of microorganisms. PPE is required based on transmission precautions.
3. Identify the patient.	Identifying the patient ensures the right patient received the intervention and helps prevent errors.
4. Close curtains around bed and close the door to the room, if possible.	This ensures the patient's privacy.
5. Determine the need for suctioning. Verify the suction order in the patient's chart, if necessary. For a postoperative patient, administer pain medication before suctioning.	To minimize trauma to airway mucosa, suctioning should be done only when secretions have accumulated or adventitious breath sounds are audible. Some facilities require an order for naso and oropharyngeal suctioning. Suctioning stimulates coughing, which is painful for patients with surgical incisions.
6. Explain what you are going to do and the reason for suctioning to the patient and family or guardians. Reassure the patient you will interrupt procedure if he or she indicates respiratory difficulty.	Explanation alleviates fears. Even if the patient appears unconscious, explain what is happening. Any procedure that compromises respiration is frightening for the patient.
7. Adjust bed to comfortable working height, susually elbow height of the caregiver. Lower side rail closest to you. If patient is conscious, place him or her in a semi-Fowler's position. If the patient is unconscious, place him or her in the lateral position, facing you. Move the bedside table close to your work area and raise it to waist height.	Having the bed at the proper height prevents back and muscle strain. A sitting position helps the patient to cough and makes breathing easier. Gravity also facilitates catheter insertion. The lateral position prevents the airway from becoming obstructed and promotes drainage of secretions. The bedside table provides a work surface and helps maintain sterility of objects on the work surface.
8. Place towel or waterproof pad across the patient's chest.	This protects bed linens.
9. Adjust suction to appropriate pressure. **For a wall unit for neonates: 60-80 mm Hg; infants: 80-100 mm Hg; children: 80-100 mm Hg; adolescents: 80-120 mm Hg (Ireton, 2007).** **For a portable unit for neonates: 6-8 cm Hg; infants 8-10 cm Hg; children: 8-10 cm Hg; adolescents: 8-10 cm Hg.**	Higher pressures can cause excessive trauma, hypoxemia, and atelectasis.

Put on a disposable glove and occlude the end of the connecting tubing to check suction pressure. Place the connecting tubing in a convenient location.	
10. Choose an appropriate sized, graduated suction catheter, with side port suction control.	Suction can cause mucosal trauma and arrhythmias (abdnormal heart rhythm).
• Size of the suction catheter should be half the diameter of the smallest nostril. • Depth of suction – with the child facing forward, measure from the nostril to the mid part of the ear lobe and down to the base of the neck.	Measured suction depth will mult eye catheters cause less trauma and arrhythmias. The catheter tip will reach the nasopharynx when measured as described.
NB. If the child has kyphoscoliosis measure both sides, add measurements together and divide by 2 (APCP Respiratory Group).	A kyphoscoliosis is an abnormal curvature of the spine in which there is forward and sideways displacement.
11. Open sterile suction package using aseptic technique. The open wrapper or container becomes a sterile field to hold other supplies. Carefully remove the sterile container, touching only the outside surface. Set it up on the work surface and pour sterile saline into it.	Sterile normal saline or water is used to lubricate the outside of the catheter, minimizing irritation of mucosa during introduction. It is also used to clear the catheter between suction attempts.
12. Place a small amount of water-soluble lubricant on the sterile field, taking care to avoid touching the sterile field with the lubricant package.	Lubricant facilitates passage of the catheter and reduces trauma to mucous membranes.
13. Increase the patient's supplemental oxygen level or apply supplemental oxygen per facility policy or primary care provider order.	Suctioning removes air from the patient's airway and can cause hypoxemia. Hyperoxygenation can help prevent suction-induced hypoxemia.
14. Put on face shield or goggles and mask. Put on sterile gloves. The dominant hand will manipulate the catheter and must remain sterile. The nondominant hand is considered clean rather than sterile and will control the suction valve (Y-port) on the catheter.	Handling the sterile catheter using a sterile glove helps prevent introducing organisms into the respiratory tract; the clean glove protects the nurse from microorganisms.
15. With dominant gloved hand, pick up steile catheter. Pick up the connecting tubing with the nondominant hand and connect the tubing and suction catheter.	Sterility of the suction catheter is maintained.
16. Moisten the cathter by dipping it into the container of sterile saline. Occlude Y-tube to check suction.	Lubricating the inside of the cathter with saline helps move secretions in the catheter. Checking suction ensures equipment is working properly.
17. Encourage the patient to take several deep breaths.	Suctioning removes air from the patient's airway and can cause hypoxemia. Hyperventilation cam help prevent suction-induced hypoxemia.

18. Apply lubricant to the first 2 to 3 inches of the catheter, using the lubricant that was placed on the sterile field.	Lubricant facilitates passage of the cathter and reduces trauma to mucous membranes.
19. Remove the oxygen delivery device, if appropriate. Do not apply suction as the catheter is inserted. Hold the catheter between your thumb and forefinger.	Using suction while inserting the catheter can cause trauma to the mucosa and remove oxygen from the respiratory tract. Correct distance for insertion ensures proper placement of the cathter.
20. Insert the catheter: a. For nasopharyngeal suctioning, gently insert catheter through the naris and along the floor of the nostril toward the trachea. Roll the catheter between your fingers to help advance it.	The general guideline for determining insertion distance for nasopharyngeal suctioning for an individual patient is to estimate the distance from the patient's earlobe to the nose.
b. For oropharyngeal ssuctioning, insert catheter through the mouth, along the side of the mouth toward the trachea.	
21. At the desired depth apply constant suction for around 2 seconds (depending on the child), and then withdraw the suction catheter slowly. Suctioning should be quick and effective, i.e. 5-10 seconds for infants and 15 seconds for older children. The procedure should take no longer than 15-20 seconds. The person suctioning must use their judgment to assess if a child can only tolerate shorter duration of suction based on their clinical symptoms. Do not rotate, stir or trombone the catheter.	To allow optimal secretion clearance and reduce the need for a second attempt. If the technique is too quick, there is a risk that not all the secretions will be cleared. If it is too slow, the child may become breathless and develop hypoxia. Prolonged suctioning or repeated insertion of the suction catheter may produce vagal stimulation, which can cause profound bradycardia.
22. Replace the oxygen delivery device using your nondominant hand, if appropriate, and have the patient take several deep breaths.	To prevent tissue damage and to enhance the child's comfort. Suctioning removes air from the patient's airway and can cause hypoxemia. Hyperventilation can help prevent suction-induced hypoxemia.
23. Flush catheter with saline. Assess effectiveness of suctioning and repeat, as needed, and according to patient's tolerance. Wrap the suction catheter around your dominant hand between attempts.	Flushing clears catheter and lubricates it for next insertion. Reassessment determines the need for additional suctioning. Wrapping prevents inadvertent contamination of catheter.
24. Allow at least 30-second to 1-minute interval if additional suctioning is needed. No more than three suction passes should be made per suctioning episode. Alternate the nares, unless contraindicated, if repeated suctioning is required. Do not force the cathter through the nares. Encourage the patient to cough and deep breathe between suctioning. Suction the oropharynx after suctioning the nasopharynx.	The interval allows for reventilation and reoxygenation of airways. Excessive suction passes contribute to complications. Alternating nares reduces trauma. Suctioning the oropharynx after the nasopharynx clears the mouth of secretions. More microorganisms are usually present in the mouth, so it is suctioned last to prevent transmission of contaminants.

25. When suctioning is completed, remove gloves from dominant hand over the coiled catheter, pulling them off inside out. Remove the gloves from nondominant hand and dispose of gloves, catheter, and container with solution in the appropriate receptacle. Assist patient to a comfortable position. Raise bed rail and place bed in the lowest position.	This technique reduces transmission of microorganisms. Proper positioning with raised side rails and proper bed height provide for patient comfort and safety.
26. Turn off suction. Remove supplemental oxygen for suctioning, if appropriate. Remove face shield or goggles and mask. Perform hand hygiene.	Proper removal of PPE and hand hygiene reduces risk of transmission of microorganisms.
27. Offer oral hygiene after suctioning.	Respiratory secretions that are allowed to accumulate in the mouth are irritating to mucous membranes and unpleasant for the patient.
28. Reassess patient's respiratory status, including respiratory rate, effort, oxygen saturation, and lung sounds.	This assesses effectiveness of suctioning and the presence of complications.
30. Remove additional PPE, if used. Perform hand hygiene.	Removing PPE properly reduces the risk for infection transmission and contamination of other items. Hand hygiene prevents the spread of microorganisms.

Modifications of Technique

If retained secretionsnot being cleared consider:

- Increasing pressure
- Increasing size of catheter

If getting trauma or if repeated suction needed:

- Use aqua gel
- May need nasopharyngeal airway – discuss with medical team
- Decrease size of catheter
- Try other nostril
- Use cool boiled water
- Change type of cathter

Difficult to get down airway:

- Change nostril
- Change position of child

If nasogastric tube in place:

- Recommend testing after suction to ensure it has not moved into the lungs to reduce the risk of aspiration
- Use opposite nostril to the one with the nasogastric tube

9. Bathing the Infant

Bathing an Infant or Small Child

Bathing not only promotes cleanliness and stimulates circulation to the skin, but also provides exercise and may help the child relax and feel more comfortable. Explain the procedure in appropriate terms. Always remain with the child when bathing occurs. Be sure to check any allergies the child may have. Always assess conditions that influence the type of bath given, such as a recent surgical incision, EEG monitor, a cast, an intravenous (IV) line or Foley catheter in place, and so on. Examine the infant or child for skin abnormalities such as rashes, birthmarks, bruises, breaks in the skin, and so on. Never use baby powder after the bath because the powder can be inhaled and cause breathing problems.

Equipment

- Wash basin or tub
- Washcloth
- Towels
- Shampoo (as appropriate)
- Mild soap
- Cotton balls
- Clean clothing
- Diapers
- Lotion (as appropriate)

Safety Issues	Rationale
Never leave a child unattended around water .	Children can drown in as little as 1 inch of water.
Place a towel or rubber mat on the bottom of the tub or basin.	Prevents the child from slipping.
Verify that the room temperature is warm enough and draft-free.	Prevents chilling.
Only sponge bathe the baby until the cord has fallen off.	The cord should be kept dry to promote healing.
Only sponge bathe the baby until the circumcision has healed.	The circumcision should not get wet in order to promote healing.
Always run cold water first.	Prevents burns.
Hold on to infant securely, supporting the head while bathing.	Babies are slippery when wet.

Action	Rationale
1. Explain procedure.	Allays anxiety.
2. Assemble equipment.	

3. Wash hands. Use gloves if body fluid precautions are warranted.	Ensures that standard precautions are followed.
4. Run water. Temperature should be 100° F (38° C). Check the temperature by submerging your wrist in the water or placing drops on the inside surface of your forearm. It should feel comfortably warm. (May use bath thermometer if available.)	Helps prevent burns as skin is actually thinner than an adults.
5. Begin by removing secretions from the child's eyes with cotton ball immersed in plain water. Use a separate cotton ball for each eye.	Ensures cleanliness and prevents any cross-contamination.
6. Shampoo hair (if necessary); wash the scalp of an infant younger than 1 year of age as necessary. Pour water over head. Apply shampoo, and rinse. Avoid eyes. Dry head with towel when finished.	Helps prevent chilling.
7. Bathe remainder of body. End with the perineal area. Remember to wash from front to back.	Always wash from clean to dirty.
Wrap in towel when finished.	Prevents chilling.
8. Apply lotion as needed.	Provides moisturizing and hydration.
9. Dress in clean clothing. Keep top edge of diaper below umbilicus site if cord has not fallen off.	Promotes healing and reduces irritation.
10. Teach hygiene practices to the parents as needed: frequency of bathing, shampooing hair, cleaning genitals, avoiding bubble bath.	Can cause vaginal irritation.

Sponge Bath to Reduce Hyperthermia

Fever is defined as body temperature above 38° C (100.4° F) rectally. The child's metabolic rate will increase 10% for every 1° C increase. The physician may only recommend monitoring the fever, since it is the body's way of defending itself against illness and is part of the immune process. Fever with temperatures less than 39° C (102.2° F) does not require treatment if the child is generally healthy (Kliegman et al., 2007). Antipyretic agents such as acetaminophen (10 to 15 mg/kg orally every 4 to 6 hours) and ibuprofen (5 to 10 mg/kg orally every 6 to 8 hours) may be ordered because they are considered safe and effective in proper doses for treatment of fever for children. (Always refer to a drug reference manual for specific information.) Ibuprofen should only be used for children older than 6 months of age. Aspirin is not recommended because of the risk for Reye syndrome. Cooling the child by reducing the room temperature and removing blankets and clothing may be beneficial if an antipyretic has been given approximately 1 hour beforehand. The antipyretic works to lower the "set point" associated with the fever, much like regulating a thermostat (body temperature is regulated by the hypothalamus).

Hyperthermia is defined as the body temperature exceeding the set point, such as from heat stroke or seizures. Tepid sponge bathing in warm water may be ordered to reduce hyperthermia (Hockenberry and Wilson, 2009). Tepid sponge bathing, however, is not effective in treating fever. When performed, the sponge bath may be given in a tub or in the child's bed. The child should not be permitted to shiver because shivering causes vasoconstriction and increased metabolism and can lead to a rise in temperature. The bath is given for approximately 20 minutes. **Alcohol should never be added to the water because it reduces the heat too rapidly and can be absorbed (leading to brain damage or even death in infants)**.

Equipment

- Basin of tepid water
- Washcloths / towels
- Bath blankets
- Waterproof sheet

Safety Issues

- Never leave a child unattended around water.
- Sponge bath should take approximately 20 minutes.
- If the child shivers, stop the procedure.
- Assess color and pulse frequently.
- Record temperature before and 30 minutes after the procedure.
- Never add alcohol to water.

Action	Rationale
1. Explain the procedure to the patient and family.	Allays anxiety.
2. Assemble the equipment at the bedside.	
3. Water temperature should be 37° C (98.6° F); needs only be 1° C or 2° F less than the child's temperature to be effective (Hockenberry and Wilson, 2009).	
4. Wash hands. Apply gloves if applicable.	Ensures that standard precautions are followed.
5. Record temperature, pulse, and respirations.	Establishes a baseline.
6. The child is placed in the tub, and water is put over the back and chest **or (if done in the bed)**	
7. Cover the patient with a bath blanket or sheet. Fanfold linens to the foot of the bed. Place a waterproof sheet and bath blanket beneath the patient. Remove patient's gown.	
8. Wash the patient's face and neck with tepid water.	
9. Lift the corner of the bath blanket, and bathe the child's body, one area at a time.	
10. Place moist, folded cloths over blood vessels that lie close to the skin (underarms and groin).	
11. Turn the patient and repeat the procedure, beginning with the neck, and then going to the shoulders, the back, and so forth.	
12. Check color and pulse to be sure that the child is tolerating the procedure without adverse effects.	Report changes to charge nurse as patient's condition may be changing.
13. If the child begins to shiver, the procedure should be immediately stopped.	Shivering causes vasoconstriction, increases temperature.
14. When the bath is completed, remove the waterproof sheet and blanket. Rub the skin dry, and replace the hospital gown and cover with sheet.	Stimulates circulation.
15. Arrange pillows and bedding for the patient's comfort.	
16. Take the patient's temperature within 30 minutes of the time the procedure ended, and record it. If the temperature has not started to go down, check to see whether the procedure should be repeated. Note: The temperature is not expected to drop to normal but merely to a more reasonable level. Also record pulse and respirations.	Report changes to charge nurse as patient's condition may be changing.
17. *Document:* Time procedure began, length of time administered, untoward reactions, patient's vital signs before and after procedure.	

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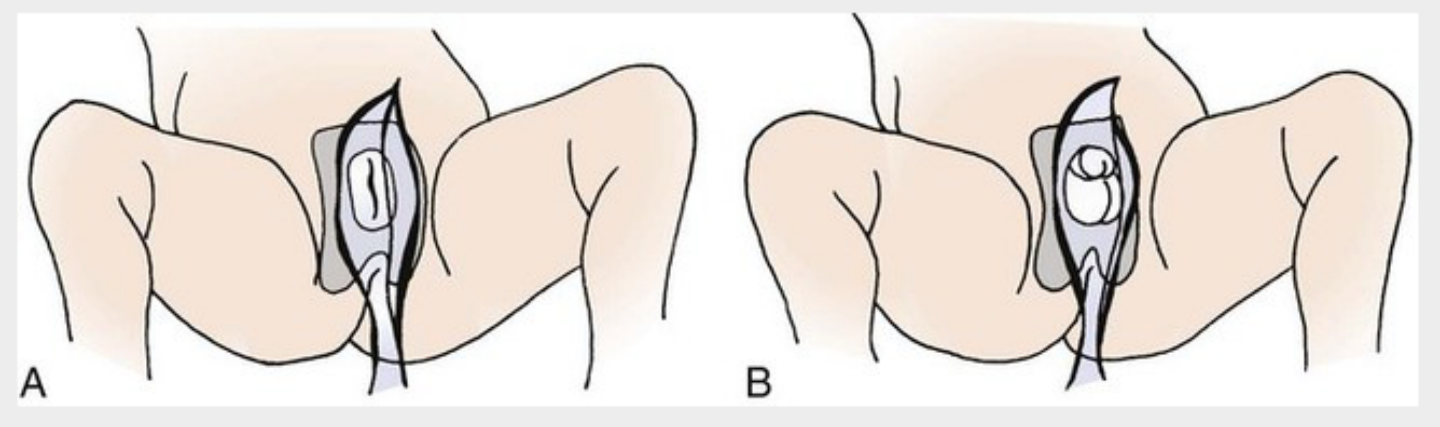
10. Laboratory Specimen Collection

Obtaining a Specimen for Urinalysis

Urine specimens are often collected in doctors' offices and clinics, as well as in the hospital. All urine specimens need to be labeled and sent to the lab immediately because bacteria accumulate at room temperature. If there is a delay, the urine specimen is to be kept refrigerated or on ice. An example would be if the patient were taking a urine specimen that was obtained at home, to a laboratory. Documentation of the procedure, including child's reactions, is also done. The physician may request that the specimen be collected with the clean-catch method, catheterization, or 24-hour collection.



Equipment

- Sterile container
- Urine collection bag (infant)

Safety Issues

- Wear gloves because of contact with body fluids.
- Check urine collection bag frequently.
- Label specimen clearly.
- Deliver specimen immediately to the laboratory *(bacteria may grow at room temperature).*

Action	Rationale
1. Explain the procedure.	Allays anxiety.
2. Wash hands; wear gloves.	Ensures that standard precautions are followed.
3. Use a sterile container, or apply a urine collection device.	
4. If a bag is used, secure the diaper over the bag or cut a slit so that the bag is outside the diaper.	Prevents leakage.
5. Check bag every 20 to 30 minutes.	Prevents leakage.

6. Label all specimens clearly, and attach the proper laboratory slip. Collected specimens should be transported in a plastic bag (check institution policy).
7. Record in nurse's notes. Document time; also color, amount, and any odor *(e.g., 30 ml clear yellow odorless urine collected in urine bag and sent to lab~signature).*

When applying newborn and pediatric urine collectors, the skin must be clean and perfectly dry. (Avoid oils, baby powders, and lotion soaps that may leave a residue on the skin and interfere with the ability of the adhesive to stick.) Apply the collection bag first to the area between the anus and genitals for boys and start at the narrow bridge of skin separating the vagina from the anus for girls. Press adhesive firmly against the skin and avoid wrinkles. Remove paper from the adhesive patch, working upward to finish applying the collection bag. Monitor closely for urine output.

Obtaining a Stool Specimen

Stool specimens from older children are obtained as for an adult. This is embarrassing for most children, who are turned off by the suggestion. The ambulatory child can use a collection device (potty hat) placed beneath a toilet seat. It is difficult for a child to tell the nurse that the sample has been collected. The nurse can acknowledge these feelings by giving the child permission to express them without being critical. The nurse might say, "I know this must be embarrassing for you. It is for grown-ups, too, but we need this because …"

Equipment

- Clean container
- Tongue blade

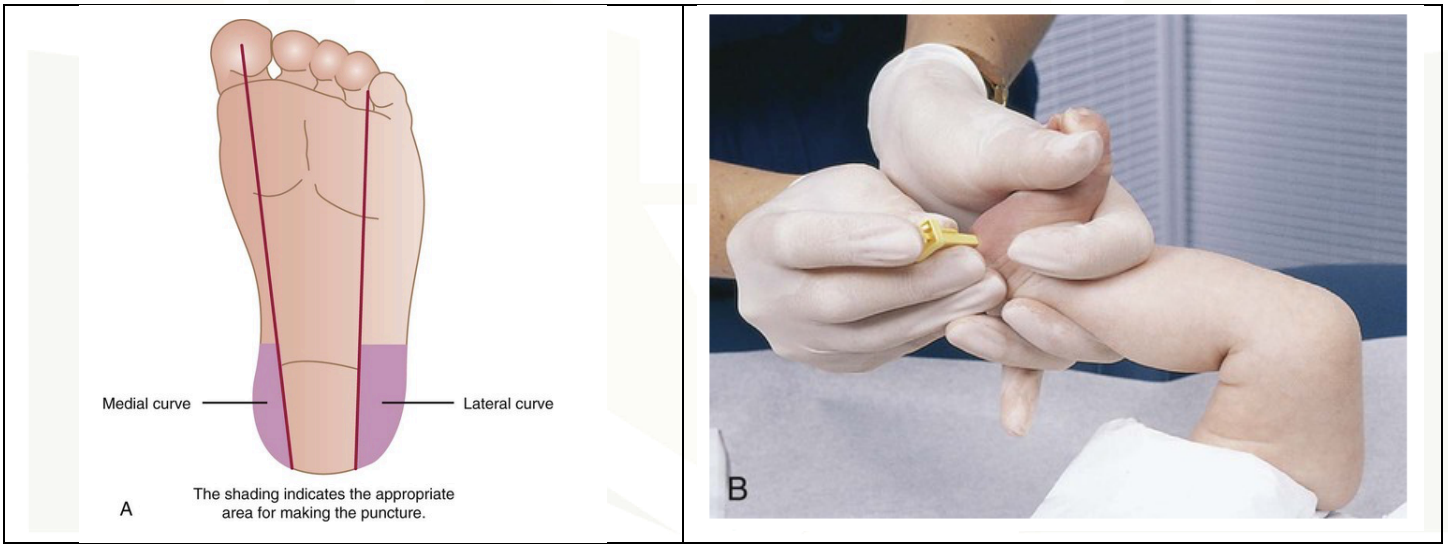
Safety Issues

- Wash hands. Wear gloves to obtain specimen.
- Label specimen appropriately.

Action	Rationale
1. Explain procedure to child or parent.	Allays anxiety.
2. Wash hands; wear gloves.	Ensures that standard precautions are followed.
3. Obtain stool specimen directly from the diaper (if it has not been contaminated by urine) with the tongue blade, or use the tongue blade to retrieve the specimen from the collection device.	
4. The specimen is labeled properly, and the laboratory slip is attached.	
5. Some specimens must be sent to the laboratory while they are warm.	
6. The nurse documents the time; also the color, amount, consistency of the stool and the purpose for which it was collected (e.g., blood, ova, parasites, bacteria); and any related information (e.g., 20 ml. loose, brown stool specimen obtained for culture and sent to lab~signature).	

Collection of Blood Specimen

Blood specimens are generally collected by the laboratory technician or a specially trained nurse. Children generally fear this procedure. EMLA (eutectic mixture of lidocaine and prilocaine) cream can be used to lessen the pain. Remember, however, that the cream needs to be in place approximately 60 minutes before the blood sample is taken (if LMX or lidocaine cream is used, allow 30 minutes). If time permits, have the blood specimen obtained in the treatment room, keeping the child's bed a safe place. The antecubital fossa is a common site for venipuncture in children older than 2 years of age. The dorsum of the hand or foot can also be used. The heel is often used in infants. If blood is to be collected from the heel, it needs to be warmed with a warmed washcloth or commercial warmer to increase the blood flow. The external jugular vein can be used in infants when other sites have not worked. The femoral vein may be used when other sites have been exhausted. Jugular and femoral venipuncture are only performed by the physician. Both the jugular and the femoral veins are large; therefore, after venipuncture, the child is checked frequently to ensure that there is no bleeding. The child is soothed accordingly if either of these sites is used, because crying and thrashing may precipitate oozing or hemorrhage. If a child has a central venous catheter or port, specially trained nurses can obtain the blood specimen by following hospital procedure. Always use standard precautions when obtaining or assisting with blood specimens. Regardless of the location used to obtain the blood specimen, the nurse charts the site used, the name of the blood test, and any untoward developments.



Many children fear losing blood, and reminding children who are old enough to understand that they are continuously producing blood helps to reassure them. Application of an adhesive bandage reassures them that their body fluids will not leak out. This is particularly helpful for preschoolers.

Obtaining a Throat Culture

A throat culture is frequently ordered by the physician when a child has a "sore throat" or a strep infection is suspected. The child may need to be temporarily restrained when a throat specimen is obtained. The child needs to stick out the tongue and say "ah" while the nurse swabs the pharyngeal area and tonsils. If the child is unable to cooperate, a tongue depressor should be used to hold down the tongue while obtaining the swabbed specimen. **If the child has a diagnosis suspicious of epiglottitis, the throat culture should not be done because the airway may become edematous (swollen) and occlude (block air movement) from the trauma of specimen collection.**

Equipment

- Throat swabs
- Tongue depressor
- Media culture
- Pen light (if necessary)

Safety Issues

- Nurse may need to wear mask/eye goggles for protection.
- Label specimen appropriately.

Action	Rationale
1. Explain procedure to child/parents.	Allays anxiety.
2. Gather equipment.	
3. Wash hands; wear gloves; apply mask and eye goggles if necessary.	Ensures that standard precautions are followed.
4. Have child stick out tongue and say "ah"	Helps visualize throat area for swabbing.
5. Depress anterior half of tongue with tongue depressor if necessary.	Use caution as this may elicit the gag reflex.
6. Swab area with exudate or redness, one time only per swab (avoid teeth, tongue, cheeks, lips, and palate).	
7. Place swab(s) into media culture without touching sides of tube.	Ensures that bacteria will be placed directly into the medium.
8. Be sure parents or nurse comfort child.	Provides reassurance once procedure is over.
9. Label, obtain requisition.	
10. Transport to laboratory.	
11. Document the time of the procedure, including description of pharyngeal area if you can see it.	

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Assessment Tools

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PRACTICAL EXAMINATION 1-SECOND SEMESTER 1441-1442 H					
Department		Nursing			
Course code	NRS 364	**Course Name**	Pediatric Health Nursing/ Practical	**Section Number**	
Date		**Duration**		**No. of pages**	
Student Name			**University ID**		

Examination Instructions

1. Write your Name and University Register number clearly in the space given above.
2. Use only blue or black ink pen or ink refill pen for writing the answers.
3. The possession of books, notes, papers, any printed materials, electronic gadgets like blue tooth, smart watches and mobile phones inside the examination hall are strictly prohibited. Students who are violating the rules shall be dealt by disciplinary committee, under the regulations of Majmaah University.

Consistency with Program Outcomes										
Knowledge			**Skills**				**Competencies**			
K1	**K2**	**K3**	**S1**	**S2**	**S3**	**S4**	**C1**	**C2**	**C3**	**C4**
		K3.1 K3.2		S2.1		S4.1	C1.1			

Marks details:							
Sections	**CLO**	**KPI**	**Marks alloted**	**Marks Obtained**	**Marks Verfification**	**Course Cordinator Name**	
Procedure	K3.1	KPI04	**2**			**Dr. Jestoni D. Maniago**	
	K3.2	KPI37	**2**				
	S2.1	KPI12	**5**				
	S4.1	KPI31	**4**			**Course Instructor Name**	
	C1.1	KPI09	**2**			**Dr. Jestoni D. Maniago**	
						Signature of Evaluator	
						Signature of Reviewer	
Total			**15**			**Total Marks Obtained: ……./15**	

*** These outcomes are not assessed in this laboratory exam**

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Checklist: PRACTICAL EXAMINATION 1

Student's Name _____
ID Number _____ **Date:** _____

Name of Procedure: _____	**Performed:**		**CLO Alignment**
Steps	**YES**	**NO**	
Step 1			
Step 2			
Step 3			
Step 4			
Step 5			
Step 6			
Step 7			
Step 8			
Step 9			
Step 10			
[add rows as needed]			

Result:

CLO	KPI	MARKS	
K3.1	KPI04	**/2**	
K3.2	KPI37	**/2**	
S2.1	KPI12	**/5**	
S4.1	KPI31	**/4**	**TOTAL: _____ / 15**
C1.1	KPI09	**/2**	

Name of Evaluator: _____

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Rubric: PRACTICAL EXAMINATION 1

Student's Name _____

ID Number _____ **Date:** _____

CLO	Assessment Attributes (Criteria)	Levels of Attainment				Marks
		Developing	Functional	Proficient	Advanced	
		Score: 0-1	Score: 2-3	Score: 4	Score: 5	
K3.1	Student's knowledge on pediatric nursing care plan	Limited understanding of the nursing process. Cannot discuss concepts in their own words.	Can explain required facts and definitions. Has adequate breadth, but limited depth of understanding of the nursing process.	Exhibits breadth and depth of understanding of concepts in the knowledge domain. Can use terminologies with minor corrections.	Exhibits accurate breadth and depth of understanding of concepts in the knowledge domain.	/2
K3.2	Student's knowledge on pediatric nursing concepts	Limited understanding of required concepts. Cannot discuss concepts in their own words.	Can explain required facts and definitions. Has adequate breadth, but limited depth of understanding of basic concepts.	Exhibits breadth and depth of understanding of concepts in the knowledge domain. Can use terminologies with minor corrections.	Exhibits accurate breadth and depth of understanding of concepts in the knowledge domain.	/2
S2.1	Student's performance on providing care to pediatric patients and their families	Cannot perform tasks and standard procedures unaided.	Can successfully perform most tasks and standard procedures largely unaided but demonstrates limited capacity to perform a nursing skill.	Can independently complete all tasks and standard procedures efficiently. Can adapt to standard procedures and protocols with minor corrections.	Effectively executes all procedures and skills efficiently and independently.	/5
S4.1	Student's performance of basic nursing skills	The student needed more than three reminders of proper procedures during skills demonstration.	The student provided safety measures with two reminders of proper procedure. Supervision and assistance required.	The student provided safety measures with one reminder of proper procedure. Supervision only required.	The student provided safe measures independently with observation only required.	/4
C1.1	Student's competency on the application of the nursing process	The student was unable to complete the entire procedure. The student was unable to utilize the nursing process.	The student was unable to complete most parts of the procedure. Demonstrate shortcuts in doing each step. The student was unable to utilize the nursing process.	The student was able to complete most parts of the procedure with minor corrections. The student was able to utilize the nursing process.	The student was able to complete the entire procedure. The student was able to utilize the nursing process.	/2
					TOTAL MARKS	**/15**

Feedback / Narrative Evaluation:

Developing is intended to describe performance of a student nurse that is not yet at the basic level of expectations. So features may be present but not enough to pass, but maybe enough to ask for further work and remedial examination.
Functional is intended to describe learning attainment of a student nurse that meets the basic requirements and can be carried out in part without support, although some may still be necessary as there still is a high degree of reliance on authority for guidance and very little translation or integration of concepts. It would correspond to a Pass.
Proficient is a desirable standard for most student nurses to reach and strongly exhibits independence, translation, integration and application. It would correspond to a credit.
Advanced is performance of a student nurse beyond core expectations that is highly independent, creative, critically reflective, generative and transformative. It would correspond to a distinction or high distinction.

Student Signature: _____ Date: _____

Instructor's Signature: _____ Date: _____

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PRACTICAL EXAMINATION 2-SECOND SEMESTER 1441-1442 H					
Department		Nursing			
Course code	NRS 364	**Course Name**	Pediatric Health Nursing/ Practical	**Section Number**	
Date		**Duration**		**No. of pages**	
Student Name			**University ID**		

Examination Instructions

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Consistency with Program Outcomes										
Knowledge			**Skills**				**Competencies**			
K1	**K2**	**K3**	**S1**	**S2**	**S3**	**S4**	**C1**	**C2**	**C3**	**C4**
		K3.1 K3.2		S2.1		S4.1	C1.1			

Marks details:

Sections	CLO	KPI	Marks alloted	Marks Obtained	Marks Verfification	Course Cordinator Name
Procedure	K3.1	KPI04	**2**			**Dr. Jestoni D. Maniago**
	K3.2	KPI37	**2**			
	S2.1	KPI12	**5**			
	S4.1	KPI31	**4**			**Course Instructor Name**
	C1.1	KPI09	**2**			**Dr. Jestoni D. Maniago**
						Signature of Evaluator
						Signature of Reviewer
Total			**15**			**Total Marks Obtained: ……./15**

*** These outcomes are not assessed in this laboratory exam**

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Checklist: PRACTICAL EXAMINATION 2

Student's Name _____
ID Number _____ **Date:** _____

Name of Procedure: _____	**Performed:**		**CLO Alignment**
Steps	**YES**	**NO**	
Step 1			
Step 2			
Step 3			
Step 4			
Step 5			
Step 6			
Step 7			
Step 8			
Step 9			
Step 10			
[add rows as needed]			

Result:

CLO	KPI	MARKS	
K3.1	KPI04	**/2**	
K3.2	KPI37	**/2**	
S2.1	KPI12	**/5**	
S4.1	KPI31	**/4**	**TOTAL: _____ / 15**
C1.1	KPI09	**/2**	

Name of Evaluator: _____

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Rubric: PRACTICAL EXAMINATION 2

Student's Name _____

ID Number _____ **Date:** _____

CLO	Assessment Attributes (Criteria)	Levels of Attainment				Marks
		Developing	Functional	Proficient	Advanced	
		Score: 0-1	Score: 2-3	Score: 4	Score: 5	
K3.1	Student's knowledge on pediatric nursing care plan	Limited understanding of the nursing process. Cannot discuss concepts in their own words.	Can explain required facts and definitions. Has adequate breadth, but limited depth of understanding of the nursing process.	Exhibits breadth and depth of understanding of concepts in the knowledge domain. Can use terminologies with minor corrections.	Exhibits accurate breadth and depth of understanding of concepts in the knowledge domain.	/2
K3.2	Student's knowledge on pediatric nursing concepts	Limited understanding of required concepts. Cannot discuss concepts in their own words.	Can explain required facts and definitions. Has adequate breadth, but limited depth of understanding of basic concepts.	Exhibits breadth and depth of understanding of concepts in the knowledge domain. Can use terminologies with minor corrections.	Exhibits accurate breadth and depth of understanding of concepts in the knowledge domain.	/2
S2.1	Student's performance on providing care to pediatric patients and their families	Cannot perform tasks and standard procedures unaided.	Can successfully perform most tasks and standard procedures largely unaided but demonstrates limited capacity to perform a nursing skill.	Can independently complete all tasks and standard procedures efficiently. Can adapt to standard procedures and protocols with minor corrections.	Effectively executes all procedures and skills efficiently and independently.	/5
S4.1	Student's performance of basic nursing skills	The student needed more than three reminders of proper procedures during skills demonstration.	The student provided safety measures with two reminders of proper procedure. Supervision and assistance required.	The student provided safety measures with one reminder of proper procedure. Supervision only required.	The student provided safe measures independently with observation only required.	/4
C1.1	Student's competency on the application of the nursing process	The student was unable to complete the entire procedure. The student was unable to utilize the nursing process.	The student was unable to complete most parts of the procedure. Demonstrate shortcuts in doing each step. The student was unable to utilize the nursing process.	The student was able to complete most parts of the procedure with minor corrections. The student was able to utilize the nursing process.	The student was able to complete the entire procedure. The student was able to utilize the nursing process.	/2
					TOTAL MARKS	**/15**

Feedback / Narrative Evaluation:

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Student Signature: _____ Date: _____

Instructor's Signature: _____ Date: _____

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ASSIGNMENT-SECOND SEMESTER 1441-1442 H					
Department	Nursing				
Course code	NRS 364	**Course Name**	Pediatric Health Nursing/ Practical	**Section Number**	
Date		**Duration**		**No. of pages**	
Student Name			**University ID**		

Examination Instructions

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Consistency with Program Outcomes										
Knowledge			**Skills**				**Competencies**			
K1	**K2**	**K3**	**S1**	**S2**	**S3**	**S4**	**C1**	**C2**	**C3**	**C4**
		K3.1 K3.2								

Marks details:							
Sections	**CLO**	**KPI**	**Marks alloted**	**Marks Obtained**	**Marks Verfification**	**Course Cordinator Name**	
NCP	K3.1	KPI04	**8**			**Dr. Jestoni D. Maniago**	
	K3.2	KPI37	**7**				
						Course Instructor Names	
						Signature of Evaluator	
						Signature of Reviewer	
Total			**15**			**Total Marks Obtained: ……./15**	

*** These outcomes are not assessed in this laboratory exam**

Rubric: ASSIGNMENT

CLO	CRITERIA	EXCEEDS STANDARDS 4	MEETS STANDARD 3	APPROACHING STANDARDS 2	DOES NOT MEET STANDARDS 1	TOTAL POINTS
K3.1	***ASSESSMENT*** Includes subjective, objective and historical data that support actual or risk for nursing diagnosis.	Includes all pertinent data related to nursing diagnosis and does not include data that is not related to nursing diagnosis.	Includes all pertinent data related to nursing diagnosis, but also includes data not related to nursing diagnosis.	Does not include all pertinent data related to nursing diagnosis. May also include data that does not relate to nursing diagnosis.	Assessment is incomplete	
K3.1	***NURSING DIAGNOSIS*** Includes the most appropriate diagnosis for patient and ordinal number that includes all appropriate parts (***problem***, + ***etiology***+ ***evidences)*** and is NANDA approved.	Diagnosis is appropriate for patient and diagnosis is NANDA approved. Diagnosis also includes all parts and information is listed in correct part of diagnosis proper etiology (related to) and sufficient data (AEB) to support diagnosis	Diagnosis is appropriate for patient and diagnosis is NANDA approved, but does not include all parts or information is listed in wrong part of diagnosis and data to support (AEB) the diagnosis is not sufficient	Diagnosis is not appropriate for patient and may also not be NANDA and may not include all parts and data with sufficient data to support the diagnosis	Diagnosis portion is incomplete and written incorrectly and data is insufficient to support the diagnosis	
K3.1	***PLAN/GOAL*** Includes a patient or family goal that is most appropriate for the patient/family and the nursing diagnosis. Goal should be measurable by at least two criteria and have a target date or time.	Goal is related to the diagnosis; written following SMART (*Specific, Measurable, Attainable, Realistic, Time Bound*)	Goal is related to the diagnosis, but SMART is not completed	Goal is correct but not related to the diagnosis	Goal is not related to the diagnosis and not SMART	
K3.2	***INTERVENTIONS*** Includes interventions or nursing actions that directly relate to the patient's goal and are specific in action. Number of interventions should be appropriate to help patient or family meet their goal.	Interventions are adequate in number to help patient/family meet the goal and are specific for the for the problem;	Interventions are adequate in number to help patient/family meet the goal and other interventions may not specific for the problem	Interventions are not adequate in number to help patient/family meet goal. Interventions may not also be specific for the problem	Interventions are incomplete and are snot appropriate for the problem	
K3.2	***RATIONALE*** Includes scientific explanation of the interventions made and based from a textbook or referenced rationale.	All interventions are supported with scientific rationale and are based from textbook citations or evidence-based information	Interventions are supported with scientific rationale. Other interventions are supported with irrelevant rationale	Rationale are not based on scientific explanation. Other interventions are supported with irrelevant rationale	Incomplete rationale provided for the interventions given	
K3.1	***EXPECTED OUTCOME*** Includes data that is listed as criteria in goal statement. Goal is determined to be met, partially met, or not met. If goal was not met or partially met, plan of care is revised or continued and a new evaluation date/time is set.	Data supports if goal is Met, partially met, Not met with appropriate revisions	Data somewhat supports if goal is Met, partially met, Not met with appropriate revisions	Data is insufficient to support if goal is Met, partially met, No met	Data do not support if goal is Met, partially met, Not met	
					TOTAL MARKS	**/15**

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NURSING CARE PLAN No. _____

ASSESSMENT	NURSING DIAGNOSIS	PLAN/GOAL	NURSING INTERVENTIONS	RATIONALE	EXPECTED OUTCOME
Subjective: Objective:			Independent: Dependent:		

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PROFESSIONALISM-SECOND SEMESTER 1441-1442 H					
Department	Nursing				
Course code	NRS 364	**Course Name**	Pediatric Health Nursing/ Practical	**Section Number**	
Date		**Duration**		**No. of pages**	
Student Name		**University ID**			

Examination Instructions

1. Write your Name and University Register number clearly in the space given above.
2. Use only blue or black ink pen or ink refill pen for writing the answers.
3. The possession of books, notes, papers, any printed materials, electronic gadgets like blue tooth, smart watches and mobile phones inside the examination hall are strictly prohibited. Students who are violating the rules shall be dealt by disciplinary committee, under the regulations of Majmaah University.

Consistency with Program Outcomes										
Knowledge			**Skills**				**Competencies**			
K1	**K2**	**K3**	**S1**	**S2**	**S3**	**S4**	**C1**	**C2**	**C3**	**C4**
							C1.1			

Marks details:

Sections	CLO	KPI	Marks alloted	Marks Obtained	Marks Verfification	Course Cordinator Name
	C1.1	KPI09	**5**			**Dr. Jestoni D. Maniago**
						Course Instructor Names
						Signature of Evaluator
						Signature of Reviewer
Total			**5**			**Total Marks Obtained: ……/5**

*** These outcomes are not assessed in this laboratory exam**

Rubric: PROFESSIONALISM

Performance Criteria	Highly Professional 4	Professional 3	Participating 2	Unprofessional 1	MARKS
Time Management	Always arrives on time and stays for entire class; regularly attends class; all absences are excused; always takes responsibility for work missed; no deadlines missed; does not seek exceptions from class/college or university policies except institutional excuses	Late to class only once or twice; almost never misses a class; no unexcused absences. Generally takes responsibility for material and work missed; no more than one deadline missed; does not seek exceptions from class/college or university policies except institutional excuses	Late to class more than once every month and regularly attends class; misses two deadlines; seeks exceptions to class/college or university policies not including institutional excuses	Late to class more than once/week and does not regularly attend class; demands exceptions to class/ college or university policies not including institutional excuses	
Respect	Careful not to distract others (socializing, sleeping, leaving early or during class, reading unrelated material, doing homework for another class or wearing inappropriate attire); never uses unapproved electronic devices in class; is respectful towards peers, adults, and the learning environment both in and out of class	Exhibits behavior that distracts others once or twice during the semester; rarely uses unapproved electronic devices in class; is almost always respectful towards peers, adults, and the learning environment both in and out of class	Recurring behavior that distracts others; recurring use of unapproved electronic devices; is not consistently respectful of peers, adults, and the learning environment both in and out of class	Is asked to leave class due to behavior that distracts others; is often extremely disrespectful to peers, adults, and the learning environment both in and out of class	
Preparedness	Almost always participates in class discussions; contributions reflect exceptional preparation and are always substantive, well supported, and persuasively presented; does not dominate discussion	Regularly participates in class discussions; contributions reflect good preparation and are generally substantive, fairly well substantiated, and moderately persuasive; when called upon, can usually answer questions and refer to readings; occasionally dominates discussion	Rarely participates in class; contributions reflect adequate or less than satisfactory preparation and are occasionally substantive, somewhat substantiated and occasionally persuasive; when called upon, often cannot answer questions in depth or refer to readings; may dominate discussion with irrelevant comments	Never participates in class; no evidence of preparation; when called upon, can't answer questions in depth or refer to readings; any comments made are usually irrelevant	
Quality of Work	Provides work of the highest quality that reflects best effort; makes strong effort to improve work; shows positive, proactive behavior; is always honest and encourages other to do the same; always adheres to class, college, and	Provides high quality work that often reflects best effort; makes moderate effort to improve work; shows positive, proactive behavior; is always honest; always adheres to class, college, and	Provides work that reflects a good effort and occasionally needs to be checked or redone; rarely shows negative behavior; is honest; does not knowingly violate class, college, or university	Provides work that reflects very little or no effort; shows negative behavior; is often not honest; knowingly violates class, college, or university academic dishonesty policies	

	university academic dishonesty policies	university academic dishonesty policies	academic dishonesty policies		
Teamwork	Makes obvious and significant contributions on projects in terms of timeliness in completing assigned work, making genuine effort to work effectively with others and providing valuable, creative, competent skills to the team; often takes leadership role	One or two complaints from team members about lack of contribution; occasionally takes leadership role	A few complaints from team members about lack of contribution	More than a few complaints from team members about lack of contribution; does not contribute in a meaningful way to group work	
Overall Impression	Professionalism at its best	Professionalism consistently exhibited	Professionalism inconsistently exhibited	Lack of professionalism	
				TOTAL MARKS	**/5**

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CASE PRESENTATION-SECOND SEMESTER 1441-1442 H					
Department		Nursing			
Course code	NRS 364	**Course Name**	Pediatric Health Nursing/ Practical	**Section Number**	
Date		**Duration**		**No. of pages**	
Student Name			**University ID**		

Examination Instructions

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Consistency with Program Outcomes										
Knowledge			**Skills**				**Competencies**			
K1	**K2**	**K3**	**S1**	**S2**	**S3**	**S4**	**C1**	**C2**	**C3**	**C4**
		K3.1 K3.2								

Marks details:							
Sections	**CLO**	**KPI**	**Marks alloted**	**Marks Obtained**	**Marks Verfification**	**Course Cordinator Name**	
	K3.1	KPI04	**5**			**Dr. Jestoni D. Maniago**	
	K3.2	KPI37	**5**				
						Course Instructor Names	
						Signature of Evaluator	
						Signature of Reviewer	
Total			**10**			**Total Marks Obtained: ……./10**	

*** These outcomes are not assessed in this laboratory exam**

Rubric: CASE PRESENTATION

Criteria	Case Presentation				
	4	3	2	1	Mark
Content (CLO K3.1)	The presentation was a concise summary of the topic with all questions answered. Comprehensive and complete coverage of information.	The presentation was a good summary of the topic. Most important information covered; little irrelevant info.	The presentation was informative but several elements went unanswered. Much of the information irrelevant; coverage of some of major points.	The presentation was a brief look at the topic but many questions were left unanswered. Majority of information irrelevant and significant points left out.	
Visual Appeal of PPT content (CLO K3.1)	There are no errors in spelling, grammar and punctuation. Information is clear and concise on each slide. Visually appealing/engaging.	There are some errors in spelling, grammar and punctuation. Too much information on two or more slides. Significant visual appeal.	There are many errors in spelling, grammar and punctuation. Too much information was contained on many slides. Minimal effort made to make slides appealing or too much going on.	There are many errors in spelling, grammar and punctuation. The slides were difficult to read and too much information had been copied onto them. No visual appeal.	
Comprehension (CLO K3.1)	Extensive knowledge of topic. Members showed complete understanding of assignment. Accurately answered all questions posed.	Most showed a good understanding of topic. All members able to answer most of audience questions.	Few members showed good understanding of some parts of topic. Only some members accurately answered questions.	Presenters did not understand topic. Majority of questions answered by only one member or majority of information incorrect.	
Presentation Skills (CLO K3.2)	Regular/constant eye contact and presenters held the audience's attention. Appropriate speaking volume & body language.	Most members spoke to majority of audience; steady eye contact. Presenters spoke at a suitable volume.	Members focused on only part of audience. Sporadic eye contact by more than one presenter. The audience was distracted. Only half of the audience heard speakers. Body language was distracting.	Minimal eye contact by more than one member focusing on small part of audience. The audience was not engaged. Presenters spoke too quickly or quietly making it difficult to understand.	
Preparedness/ Participation/ Group Dynamics (CLO K3.2)	All presenters knew the information, participated equally, and helped each other as needed. Extremely prepared and rehearsed.	Slight domination of one presenter. Members helped each other. Very well prepared.	Significant controlling by some members with one minimally contributing. Primarily prepared but with some dependence on just reading off slides.	Unbalanced presentation or tension resulting from over-helping. Multiple group members not participating. Evident lack of preparation/rehearsal. Dependence on slides.	
				TOTAL MARKS	**/10**

Medical Diagnosis	

PHYSICAL ASSESSMENT	
Skin:	
Head:	
Eye:	
Ear:	
Nose:	
Mouth:	
Neck:	
Chest:	
Breast:	
Abdomen:	
Upper extremities:	
Back:	
Lower extremities:	

Genitalia:	
Reflexes:	
ANY ABNORMAL VITAL SIGNS	

DIAGNOSTIC AND LABORATORY PROCEDURES				
NO.	**NAME OF THE PROCEDURE**	**ABNORMAL RESULT**	**NORMAL RANGE**	**ANALYSIS**
OTHER DIAGOSTIC TESTS (x-ray, MRI, ultrasonography, CT-scan and etc.) • **Impression:**				

MEDICATIONS					
NO.	**NAME OF DRUG**	**CLASSIFICATION**	**DOSE & FREQUENCY**	**ROUTE**	**NURSE'S ROLE**

DETAILS OF DISEASE CONDITION					
Definition					
Anatomy and Physiology					
Etiology					

Signs and Symptoms	
Patophysiology	

Complications	
MANAGEMENT	
Nursing Interventions	
Health Teachings	
References	

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FINAL PRACTICAL EXAMINATION-SECOND SEMESTER 1441-1442 H					
Department		Nursing			
Course code	NRS 364	**Course Name**	Pediatric Health Nursing/ Practical	**Section Number**	
Date		**Duration**		**No. of pages**	
Student Name			**University ID**		

Examination Instructions

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Consistency with Program Outcomes										
Knowledge			**Skills**				**Competencies**			
K1	**K2**	**K3**	**S1**	**S2**	**S3**	**S4**	**C1**	**C2**	**C3**	**C4**
		K3.1 K3.2		S2.1		S4.1	C1.1			

Marks details:

Sections	CLO	KPI	Marks alloted	Marks Obtained	Marks Verfification	Course Cordinator Name
Procedure	K3.1	KPI04	**3**			**Dr. Jestoni D. Maniago**
	K3.2	KPI37	**3**			
	S2.1	KPI12	**15**			
	S4.1	KPI31	**15**			**Course Instructor Names**
	C1.1	KPI09	**4**			
						Signature of Evaluator
						Signature of Reviewer
Total			**40**			**Total Marks Obtained: ……/40**

*** These outcomes are not assessed in this laboratory exam**

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Checklist: FINAL PRACTICAL EXAMINATION

Student's Name _____
ID Number _____ **Date:** _____

Name of Procedure: _____	**Performed:**		**CLO Alignment**
Steps	**YES**	**NO**	
Step 1			
Step 2			
Step 3			
Step 4			
Step 5			
Step 6			
Step 7			
Step 8			
Step 9			
Step 10			
[add rows as needed]			

Result:

CLO	KPI	MARKS	
K3.1	KPI04	**/3**	
K3.2	KPI37	**/3**	
S2.1	KPI12	**/15**	
S4.1	KPI31	**/15**	**TOTAL: _____ / 40**
C1.1	KPI09	**/4**	

Name of Evaluator: _____

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Rubric: FINAL PRACTICAL EXAMINATION

Student's Name _____

ID Number _____ **Date:** _____

CLO	Assessment Attributes (Criteria)	Levels of Attainment				Marks
		Developing	Functional	Proficient	Advanced	
		Score: 0-1	Score: 2-3	Score: 4	Score: 5	
K3.1	Student's knowledge on pediatric nursing care plan	Limited understanding of the nursing process. Cannot discuss concepts in their own words.	Can explain required facts and definitions. Has adequate breadth, but limited depth of understanding of the nursing process.	Exhibits breadth and depth of understanding of concepts in the knowledge domain. Can use terminologies with minor corrections.	Exhibits accurate breadth and depth of understanding of concepts in the knowledge domain.	/3
K3.2	Student's knowledge on pediatric nursing concepts	Limited understanding of required concepts. Cannot discuss concepts in their own words.	Can explain required facts and definitions. Has adequate breadth, but limited depth of understanding of basic concepts.	Exhibits breadth and depth of understanding of concepts in the knowledge domain. Can use terminologies with minor corrections.	Exhibits accurate breadth and depth of understanding of concepts in the knowledge domain.	/3
S2.1	Student's performance on providing care to pediatric patients and their families	Cannot perform tasks and standard procedures unaided.	Can successfully perform most tasks and standard procedures largely unaided but demonstrates limited capacity to perform a nursing skill.	Can independently complete all tasks and standard procedures efficiently. Can adapt to standard procedures and protocols with minor corrections.	Effectively executes all procedures and skills efficiently and independently.	/15
S4.1	Student's performance of basic nursing skills	The student needed more than three reminders of proper procedures during skills demonstration.	The student provided safety measures with two reminders of proper procedure. Supervision and assistance required.	The student provided safety measures with one reminder of proper procedure. Supervision only required.	The student provided safe measures independently with observation only required.	/15
C1.1	Student's competency on the application of the nursing process	The student was unable to complete the entire procedure. The student was unable to utilize the nursing process.	The student was unable to complete most parts of the procedure. Demonstrate shortcuts in doing each step. The student was unable to utilize the nursing process.	The student was able to complete most parts of the procedure with minor corrections. The student was able to utilize the nursing process.	The student was able to complete the entire procedure. The student was able to utilize the nursing process.	/4
					TOTAL MARKS	/40

Feedback / Narrative Evaluation:

Developing is intended to describe performance of a student nurse that is not yet at the basic level of expectations. So features may be present but not enough to pass, but maybe enough to ask for further work and remedial examination.
Functional is intended to describe learning attainment of a student nurse that meets the basic requirements and can be carried out in part without support, although some may still be necessary as there still is a high degree of reliance on authority for guidance and very little translation or integration of concepts. It would correspond to a Pass.
Proficient is a desirable standard for most student nurses to reach and strongly exhibits independence, translation, integration and application. It would correspond to a credit.
Advanced is performance of a student nurse beyond core expectations that is highly independent, creative, critically reflective, generative and transformative. It would correspond to a distinction or high distinction.

Student Signature: _____ Date: _____

Instructor's Signature: _____ Date: _____

Exercise A

Written Exercise – Determining a child's age, selecting growth charts to use in the Growth Record

In this exercise you will determine the age of several children using the WHO child age calculator. Then you will determine which growth charts in the *Growth Record* should be used during the child's growth assessment.

Answer the questions about each case described below:

1. On 30 June 2006, Mrs. Ismail brings her son Salaam to the health centre because he has ear pain. The Personal Data page in Salaam's *Boy's Growth Record* says that he was born on 12 September 2004.

   What is Salaam's age today, as it should be recorded in the Visit Notes (page 6) of the *Boy's Growth Record*?

   After weighing and measuring Salaam and recording his weight and length in the Visit Notes, which four growth charts from the *Growth Record* should the health care provider use for Salaam's growth assessment?

   Title of growth chart: *Page number:*

2. On 19 April 2006, a girl named Ruby is seen at the health centre for a well-child visit. Ruby's grandmother says that Ruby's *Girl's Growth Record* has been lost. She says that Ruby will celebrate her first birthday soon, on the first day of May. The health care provider begins a new *Girl's Growth Record* for Ruby by completing the Personal Data page.

   What is Ruby's date of birth, as it should be recorded on the Personal Data page?

   What is Ruby's age today, as it should be recorded on the Visit Notes page?

Exercise B

Continuing Case Studies – Nalah and Toman

In this exercise, you will begin a *Growth Record* for a girl named Nalah and one for a boy named Toman. You will continue to follow the growth of Nalah and Toman throughout this course. You have been given a *Girl's Growth Record* and a *Boy's Growth Record* to use in this and other exercises about Nalah and Toman.

Read the information about each child below and follow the instructions given.

Nalah

Nalah Parab was born on 7 February 2006. She was a single, term birth (38 weeks of pregnancy). According to her birth record, her weight was 2.9 kg and length was 49 cm. Her head circumference was not measured.

Nalah's parents are Hamid and Shira Parab. Their address is at 40 Rim Road. Nalah is the first and only child born to her mother. She is breastfed, but she has also been taking some water since she was 3 weeks old. There have been no unusual adverse events in her life so far.

The date of Nalah's visit to the health centre is 25 March 2006. Her mother has brought her for immunization.

Instructions:

1. Complete the Personal Data page of the *Girl's Growth Record* for Nalah. (You may make up a record number.)
2. In the Visit Notes section of the *Girl's Growth Record*, record Nalah's date of birth. On the first row, enter the date of Nalah's visit, her age today, and the reason for her visit.
3. List below the titles and page numbers of the four growth charts that the health care provider should use during Nalah's growth assessment.

Toman

Toman Baruni comes to the health centre with his mother, Salwa Baruni, on 15 August 2006 for a well-child visit. Mrs Baruni thinks that it must be time for Toman to have another immunization, but she has lost his *Growth Record*, so she is not sure. She says that his last visit to the health centre was at 6 months, and he had received all of his immunizations at that point.

In order to start a new *Boy's Growth Record*, the health care provider asks Mrs Baruni about Toman's birth. Mrs Baruni says that Toman was born on 10 July 2005. He was a single, term birth and weighed 3.5 kg. She does not remember his length or head circumference.

Mrs Baruni was sick at Toman's birth, and Toman was given infant formula by the nurses for 3 days in the hospital. After leaving the hospital Mrs Baruni breastfed Toman, but she stopped after 3 months.

Toman is Mrs Baruni's second child. He lives with her at 100 Centre Street, Apartment 22. Mrs Baruni's first child was born of a different husband and lives with him. Toman has no younger siblings. Mrs Baruni is separated from Shaka Baruni, but Toman spends weekends with his father. Mrs Baruni does not think that the separation has been traumatic for Toman.

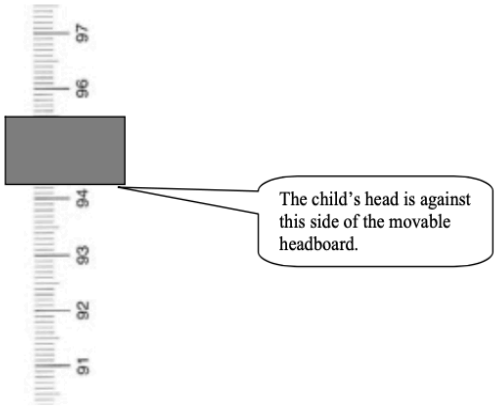
Instructions:

1. Complete the Personal Data page of the *Boy's Growth Record* for Toman. (You may make up a record number.)
2. Above the Visit Notes section of the *Boy's Growth Record*, record Toman's date of birth for easy reference. On the first row, enter the date of Toman's visit, his age today, and the reason for his visit.
3. List below the titles and page numbers of the four growth charts that the health care provider should use during Toman's growth assessment.

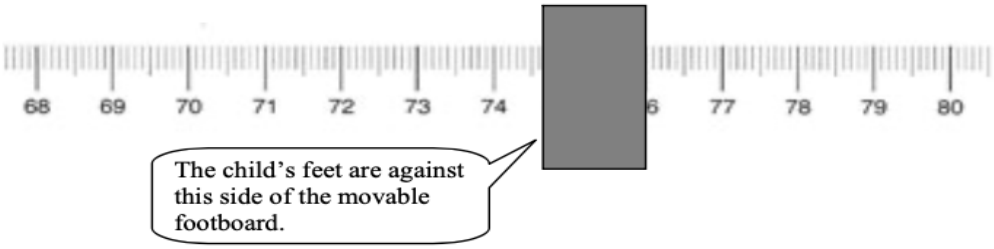
Exercise C

Recording the Measurements

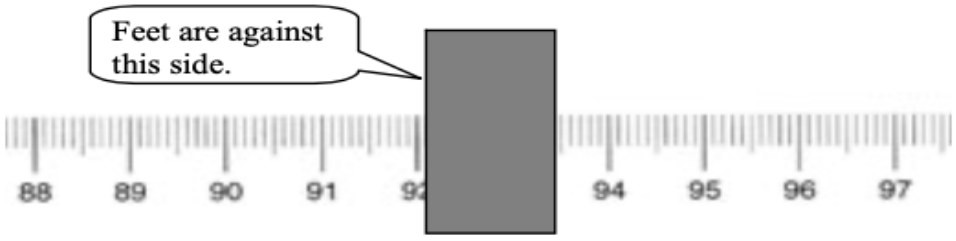
1. This picture shows part of a measuring tape for a 3-year-old whose height is being measured. Record the height: _____



2. This picture shows part of a measuring tape for an 11-month-old child whose length is being measured. Record the length: _____



3. This picture shows part of a measuring tape for 2-year-old child who will not stand on the measuring board. His length is being measured, but his height must be recorded. What is his length? _____ What height should be recorded?_____



Exercise D

BMI

Use the BMI table to find the BMI of the following children. If you have a calculator, also calculate the BMI using your calculator and compare the result.

1. A 3-year-old child is 100 cm in height and weighs 14.0 kg.

2. An 18-month-old child is 78.8 cm in length and weighs 11.2 kg.

3. A 4-year-old child is 118.5 cm in height and weighs 22.5 kg.

4. A newborn is 48.2 cm in length and weighs 3.1 kg.

Exercise E

Continuing Case Studies – Nalah and Toman

In Exercise B you began a *Girl's Growth Record* for Nalah and a *Boy's Growth Record* for Toman. In this exercise you will enter additional information from a series of visits by each child on the Visit Notes page, and determine age and BMI at each visit. You may use either a calculator or the BMI table to determine BMI.

Nalah

On the Visit Notes page of Nalah's *Girl's Growth Record*, you have already recorded some information from her visit of 25 March 2006, when she was 6 weeks old. Open her Growth Record to the Visit Notes.

1. Nalah's weight at 6 weeks was 3.5 kg and her length was 51.3 cm. Record her weight and length at 6 weeks on the Visit Notes page. Determine her BMI and record it in the Visit Notes as well.
2. Following is information from four subsequent visits by Nalah. Enter this information on the Visit Notes page. Determine Nalah's age and BMI at each visit and enter those as well.

Date of visit	Weight	Length	Reason for visit
20 April 2006	4.2 kg	54.8 cm	immunization
22 May 2006	4.3 kg	54.8 cm	diarrhoea
26 June 2006	4.8 kg	56.2 cm	immunization
15 August 2006	5.4 kg	58.1 cm	well-baby visit

Toman

On the Visit Notes page of Toman's *Boy's Growth Record*, you have already recorded some information from his visit of 15 August 2006, when he was 1 year and 1 month old. Open his *Growth Record* to the Visit Notes.

1. Toman's weight at 1 year and 1 month old was 11.9 kg and his length was 79.0 cm. Record his weight and length at this age on the Visit Notes page. Determine his BMI and record it as well.
2. Following is information from three subsequent visits by Toman. Enter this information on the Visit Notes page. Determine Toman's age and BMI at each visit and enter those as well.

Date of visit	Weight	Length/Height	Reason for visit
15 December 2006	13.5 kg	84.5 cm	well-child visit
16 March 2007	15.0 kg	87.0 cm	ear pain
12 July 2007	16.8 kg	90.9 cm	well-child visit

Exercise F

Measuring weight, length, and height

This will be a practical exercise in a clinic setting, or in the classroom if children and measuring equipment can be brought there. The mothers should be present, if possible, to tell the children's dates of birth and to assist with measuring and reassuring them.

Your facilitator will assign you to work in pairs. Each pair should do the following steps for at least two children, one who is less than 2 years old and one who is 2–5 years old.

- Review records or ask the mother to determine the child's name, sex, and date of birth. Record this information in the inset box below on the left.
- Use the age calculator to determine the child's age today.
- Make a visual assessment of the child (e.g. does the child appear thin, fat, active, lethargic)?
- Observe the child for signs of marasmus or kwashiorkor. If there is any apparent edema, test for edema of both feet.
- Weigh the child.
- Measure the child's length or height.
- Record results on the Visit Notes page below.
- Calculate the BMI and record it below. You may use the BMI table or a calculator to determine the BMIs.

Visit Notes

	Date	Age today (Completed years/months or weeks)	Measurements (Record below; then plot on charts)			Reason for visit, observations, recommendations
			Weight (kg)	Length/ Height (cm)	BMI	
Child 1: *Sex:* *DOB:*						
Child 2: *Sex:* *DOB:*						
Child 3: *Sex:* *DOB:*						
Child 4: *Sex:* *DOB:*						

DOWNLOADABLE FILES:

Boys Growth Record:	https://www.who.int/childgrowth/training/boys_growth_record.pdf
Girls Growth Record:	https://www.who.int/childgrowth/training/Girls_growth_record.pdf
BMI Table:	https://www.who.int/tools/growth-reference-data-for-5to19-years/indicators/bmi-for-age